



**EDF GROUP**

**2012**  
**REFERENCE**  
**DOCUMENT**  
**ANNUAL FINANCIAL REPORT**

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French société anonyme  
with a share capital of €924,433,331  
Registered head office: 22-30, avenue de Wagram  
75382 Paris Cedex 08  
552 081 317 RCS Paris

# EDF Group

## Reference Document

### 2012 Annual Financial Report



This reference document was filed with the *Autorité des marchés financiers* (the "AMF") on 5 April 2013 in accordance with Article 212-13 of the AMF General Regulations. It may be used for purposes of a financial transaction if supplemented with an offering memorandum (*note d'opération*) that received a visa from the AMF. This document has been prepared by the issuer and its signatories are responsible for its content.

Pursuant to Article 28 of the European Commission Regulation (EC) No. 809/2004, the following information is incorporated by reference into this Reference Document:

- consolidated financial statements of the EDF group for the fiscal year ended 31 December 2011, prepared in accordance with international accounting standards, as well as the accompanying Statutory Auditors' reports, set forth respectively in Chapter 20, sections 20.1 (pages 289 to 385) and 20.2 (pages 386 and 387) of the EDF group's 2011 Reference Document;
- consolidated financial statements of the EDF group for the fiscal year ended 31 December 2010, prepared in accordance with international accounting standards, as well as the accompanying Statutory Auditors' reports, set forth respectively in Chapter 20, sections 20.1 (pages 269 to 383) and 20.2 (pages 384 and 385) of the EDF group's 2010 Reference Document;
- the review of the financial position and results of the EDF group for the fiscal year ended 31 December 2011, presented in Chapter 9 (pages 180 to 215) of the EDF group's 2011 Reference Document.

Copies of this Reference Document are available free of charge at EDF (22-30, avenue de Wagram, 75382 Paris Cedex 08) and on the EDF website (<http://www.edf.com>) as well as on the AMF website (<http://www.amf-france.org>).



In this reference document, unless otherwise stated, references to “**Company**” and “**EDF**” refer to EDF SA, the parent company, and references to “**EDF group**” and “**Group**” refer to EDF and its subsidiaries and affiliates.

In addition to the information contained in this reference document, investors should carefully consider the risk factors described in section 4.1 (“**Risk factors**”). These risks, or one of these risks, could negatively impact the Group’s activities, its financial position or its financial results. Furthermore, other risks, which have not yet been identified or considered as material by the Group, could have the same negative impact and investors could consequently lose all or part of their investment in the Company.

This reference document also contains information relating to the markets in which the EDF group is present. This information has been taken from surveys carried out by external sources. Considering the very rapid changes that characterise the energy sector in France and globally, it is possible that this information could prove to be erroneous or no longer up to date on the filing date of this reference document or thereafter. The Group’s activities could consequently evolve in a manner different from those described in this reference document and the declarations or information appearing in this reference document could prove to be erroneous.

Forward-looking statements in this reference document, notably in section 6.1 (“**Strategy**”) could also be impacted by risks, uncertainties or other factors that may cause the future income, performances and achievements of the Group to differ significantly from the objectives expressed and suggested. These factors may include changes in the economic and commercial environment, in regulations, as well as the factors set forth in section 4.1 (“**Risk factors**”).

Pursuant to European and French legislation, the entities responsible for the transmission and distribution of electricity within the EDF group may not communicate certain information they gather within the framework of their activities to the other entities of the Group, including its Management. Similarly, certain data specific to generation and marketing activities may not be communicated to the entities responsible for transmission and distribution. This reference document has been prepared by the EDF group in compliance with these rules.

A glossary for the major technical terms is provided at the end of this reference document, before the Appendices.



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# 1 Person responsible

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## 1.1 Person responsible for the reference document

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Henri Proglio, Chairman and Chief Executive Officer of EDF.

## 1.2 Certification from the person responsible for the reference document containing the annual financial report

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Having taken all reasonable care to ensure that such is the case, I certify that, to the best of my knowledge, the information contained in this reference document accurately reflects the facts and contains no omission likely to affect its meaning.

I certify that, to the best of my knowledge, the financial statements are prepared in accordance with accounting standards and that they give a true and fair view of the assets and liabilities, financial position and the income of the Company and of all the companies included in the consolidation, and that the management report ("*Rapport de gestion*") presents a true and fair view of the business trends, income and financial position of the Company and of all the companies included in the consolidation and a description of the main risks and uncertainties they face.

I have obtained a letter from the Statutory Auditors certifying that they have verified the financial and accounting information provided in this reference document and that they have read the document in entirety. This letter contains no comments.

The consolidated financial statements for the year ended 31 December 2012 presented in the reference document have been reviewed by the Statutory Auditors; their report and comments are set forth on pages 366 and 367 of this document which contain comments in respect of the change in accounting method for actuarial gains and losses on post-employment benefits and the valuation of long term provision relating to nuclear generation.

Henri PROGLIO,  
Chairman and Chief Executive Officer of EDF.



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# 2 Auditors

## 2.1 Statutory Auditors

### **Deloitte et Associés**

185, avenue Charles-de-Gaulle, 92200 Neuilly-sur-Seine, represented by Mr. Alain Pons and Mr. Patrick Suissa.

### **KPMG SA**

Immeuble Le Palatin, 3, cours du Triangle, 92939 Paris - la Défense cedex, represented by Mr. Bernard Cattenoz and Mr. Jacques-François Lethu.

The Statutory Auditors were initially appointed by decision of the Shareholders' Meeting of 6 June 2005 for a period of six fiscal years expiring

at the end of the Shareholders' Meeting ruling on the financial statements covering the fiscal year closing 31 December 2010.

Their terms of office were renewed by decision of the Combined Shareholders' Meeting of 24 May 2011 for a new period of six fiscal years expiring at the end of the Shareholders' Meeting ruling on the financial statements covering the fiscal year closing 31 December 2016.

The aforementioned Auditors consequently certified the financial statements reproduced in this reference document.

## 2.2 Deputy Auditors

### **BEAS**

195, avenue Charles-de-Gaulle, 92200 Neuilly-sur-Seine.

### **KPMG Audit IS**

Immeuble Le Palatin, 3, cours du Triangle, 92939 Paris - la Défense cedex.

The term of office of the company BEAS, initially appointed as Alternate Auditors by decision of the Shareholders' Meeting of 6 June 2005 for a period of six fiscal years expiring at the end of the Shareholders' Meeting ruling on the financial statements covering the fiscal year closing 31 December 2010,

was renewed by decision of the Combined Shareholders' Meeting of 24 May 2011 for a new period of six fiscal years expiring at the end of the Shareholders' Meeting ruling on the financial statements covering the fiscal year closing 31 December 2016.

The company KPMG Audit IS was appointed as Alternate Auditors by decision of the Combined Shareholders' Meeting of 24 May 2011, replacing SCP Jean-Claude André, for a period of six fiscal years expiring at the end of the Shareholders' Meeting ruling on the financial statements covering the fiscal year closing 31 December 2016.

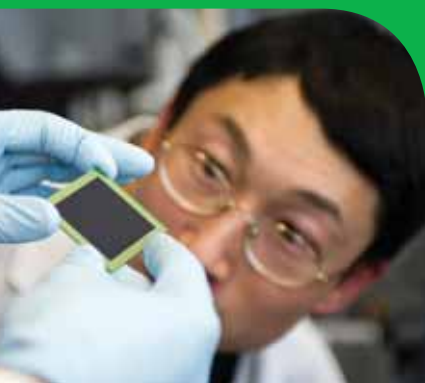


Photo credit © EDF – Philippe Stroppa

# 3 Selected financial information

Pursuant to European regulation No. 1606/2002/EC of 19 July 2002 on the adoption of international accounting standards, the Group's consolidated financial statements for the year ended 31 December 2012 are prepared under the international accounting standards published by the IASB and

approved by the European Union for application as of 31 December 2012. These international standards are the IAS (International Accounting Standards), IFRS (International Financial Reporting Standards), and their interpretations (SIC and IFRIC).

## Key financial information

The selected financial information presented below is taken from the EDF group's consolidated financial statements as of 31 December 2012, which has been audited by EDF's Statutory Auditors.

The selected financial information below must be read in conjunction with (i) the consolidated financial statements included in section 20.1 ("Historical Financial Information") of this *Document de Référence*, and (ii) the operating and financial review contained in chapter 9 of this *Document de Référence*.

## Extracts from the consolidated income statements

(in millions of Euros)	2012	2011 <sup>(1)</sup>	2011 <sup>(2)</sup>
Sales	72,729	65,307	65,307
Operating profit before depreciation and amortization (EBITDA)	16,084	14,939	14,824
Operating profit (EBIT)	8,245	8,452	8,286
Income before taxes of consolidated companies <sup>(3)</sup>	4,883	4,672	4,506
<b>EDF NET INCOME</b>	<b>3,316</b>	<b>3,148</b>	<b>3,010</b>

(1) Figures fulfilled in 2012 for the 2011 final year have been restated for the impact of the change in accounting method for actuarial gains and losses on post-employment benefits.

(2) Data published in 2011 for the 2011 fiscal year.

(3) Income before taxes of consolidated companies corresponds to the EDF group's net income before income taxes; share in income of companies accounted for under the equity method, net income from discontinued operations, and minority interests.



## Extracts from the consolidated balance sheets

(in millions of Euros)	31/12/2012	31/12/2011 <sup>(1)</sup>	31/12/2011 <sup>(2)</sup>
Non-current assets	181,792	163,281	163,026
Current assets	68,085	67,980	67,980
Assets classified as held for sale	241	701	701
<b>TOTAL ASSETS</b>	<b>250,118</b>	<b>231,962</b>	<b>231,707</b>
Equity (Group share)	25,858	28,483	30,570
Non controlling interest	4,854	4,189	4,337
Non-current provisions	61,688	53,956	51,560
Other non-current liabilities	99,350	93,925	93,925
Current liabilities	58,319	51,003	50,909
Liabilities related to assets classified as held for sale	49	406	406
<b>TOTAL EQUITY AND LIABILITIES</b>	<b>250,118</b>	<b>231,962</b>	<b>231,707</b>

(1) Figures fulfilled in 2012 for the 2011 final year have been restated for the impact of the change in accounting method for actuarial gains and losses on post-employment benefits.

(2) Data published in 2011 for the 2011 fiscal year.

## Extracts from the consolidated cash flow statements

(in millions of Euros)	2012	2011
Net cash flow from operating activities	9,924	8,497
Net cash flow used in investing activities	(14,410)	(6,791)
Net cash flow from financing activities	4,657	(1,591)
<b>NET INCREASE/(DECREASE) IN CASH AND CASH EQUIVALENTS</b>	<b>171</b>	<b>115</b>

## Information concerning net indebtedness

The definition of net indebtedness was revised in 2012 to take into account the Group's lending to jointly-controlled subsidiaries.

(in millions of Euros)	31/12/2012	31/12/2011
Loans and other financial liabilities	59,932	50,034
Derivatives used to hedge liabilities	(797)	(834)
Cash and cash equivalents	(5,874)	(5,743)
Liquid assets	(10,289)	(9,024)
Loan to RTE <sup>(1)</sup> and to jointly-controlled subsidiaries	(1,397)	(1,400)
Net indebtedness from assets held for sale	-	252
<b>NET INDEBTEDNESS</b>	<b>41,575</b>	<b>33,285</b>

(1) RTE: Réseau de Transport d'Électricité (RTE).



# 4 Risk Factors

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## 4.1 Risk factors

The Group operates in an environment that is experiencing profound change, which generates various risks, some of which are beyond its control and which are in addition to the risks inherent in its business operations. Below the Group describes the material risks to which it considers itself exposed. One or more of these risks could have an adverse effect on the Group's activities or results. Moreover, other risks, of which it is currently unaware, or which it currently believes are not material, may also have an adverse effect.

In particular, the Group faces legal risks in all of its activities and in its various markets. Legal risks associated with *inter alia* the statutory and regulatory framework, operating activities, partnerships set up and contracts concluded with customers and suppliers are described below and mentioned in section 4.3 ("Dependency factors"). Key litigation, proceedings and arbitrations in which the Group is involved are described in section 20.5 ("Legal proceedings and arbitration").

The risks described below are risks associated with the European energy markets and the Group's activities, risks specifically related to the Group's nuclear activities, risks related to the structure of the Group and changes thereto and, lastly, risks associated with EDF's capital structure and the listing of its shares.

### 4.1.1 Risks associated with the European energy markets

**The Group faces stiff competition in the European energy markets and, in particular, in the French electricity market, which is its main market.**

In France, since 1 July 2007, the electricity market has been totally open to competition. All EDF customers may now choose their electricity supplier and can therefore choose any of EDF's competitors (see section 6.2.1.2 ("Sales and marketing")). EDF has implemented measures to meet the competition, but the changing competitive landscape (new regulations, emergence of new players, mergers between existing players, etc.) could cause EDF to lose market share. This loss of market share could, at constant consumption and price levels, have an adverse impact on the Group's sales. Lastly, to achieve its objectives, EDF could be forced to increase its marketing expenditures or reduce its margins (especially in the event of price competition), which would have a negative effect on its profitability.

Elsewhere in Europe, the Group faces differing contexts, depending on the competitive situation (more or less totally open markets, position of competitors, regulations, etc.). Therefore, in some countries, or in certain regions within a country, the Group must pursue a defensive strategy to protect its market share, as it does in France. On the other hand, in other countries, the Group must pursue an offensive strategy to gain market share. The type of competition, the expansion of such competition and its effect on the Group's activities and its results vary from one country to another. These factors depend on the degree of deregulation in the country in question and on various other factors over which the Group has no control.

Within this context, despite the fact that the Group considers that the European electricity market offers opportunities, the Group may not be able to defend its market share or gain expected market shares, or it may see its margins decrease, which would have a negative effect on its activities, its strategy and its financial results.

**The legal framework governing the liberalisation of the energy sector is recent. This framework may change in the future and become more restrictive.**

The Group's activities in France and abroad are subject to numerous regulations (see section 6.5 ("Legislative and regulatory environment")). Moreover, laws may vary from one country to another, including in the European Union where directives only establish a general framework.

This legal framework organizing the liberalisation of the energy sector is relatively recent and does not necessarily provide comprehensive solutions to the difficulties created by market liberalisation. The legal framework is therefore subject to change, and such changes could be unfavourable to the Group. Such future changes to the legal framework, whether in France or abroad, could generate additional costs, be inconsistent with the Group's growth model or change the competitive context in which the Group operates.

For example, in the United Kingdom, the legal framework governing electricity producers' access to the main UK transmission and distribution network was amended in 2010. Against this background, in May 2012, the UK regulator (Ofgem) published a decision confirming its support for a gradual change to electricity network access rates and requesting that the network manager (National Grid Electricity Transmission Company) submit various options for such change. This may lead to higher costs for operators and impact the profitability of current and future generating units.

**Due to its dominant position in the French market, the Group faces the risk of having its expansion limited more than its competitors.**

Although it has seen a decrease in its market share due to market liberalisation, EDF should remain the largest operator in the French electricity market over the next few years, particularly with respect to power generation and supply.

The transmission and distribution businesses operated by RTE and Électricité Réseau Distribution France (ERDF), respectively, are required to be operated in a manner that ensures they are independent from generation and marketing activities in order to ensure non-discriminatory access to all users (see section 6.2.2 ("Regulated activities in France")).

Although EDF complies and will continue to strictly comply with the applicable competition and non-discrimination rules, competitors have initiated and may initiate litigation on the grounds of non-compliance with these rules, and such litigations could be decided against the Group's interests.

In addition, the competent authorities or certain governments could, in order to maintain or enhance competition in certain energy markets, take decisions contrary to the Group's economic or financial interests or that impact its model as an integrated and balanced operator (see in particular, section 6.5.3.1, ("European legislation") and section 20.5.1 ("Legal proceedings concerning EDF")), which could have a material adverse impact on the Group's model, activities and financial results.

In France, for example, a provision of the NOME (New Organization of Electricity Markets) Act of 7 December 2010 provides for a transitional period, until the end of 2025, of regulated access to electricity generated by existing nuclear capacity ("*accès régulé à l'électricité nucléaire historique*" or "ARENH") for operators supplying end users or network managers to cover their losses in mainland France (see section 6.5 ("Legislative and regulatory environment")). The impact of this measure may be significant for the businesses and results of EDF.

Other European countries may also claim that the liberalisation of the French market is insufficient and implement measures intended to slow the Group's expansion in their own countries.

### **Laws and regulations that require transmission and distribution activities to be managed independently limit control over these activities.**

In accordance with current laws and regulations, EDF manages its transmission and distribution networks independently from its generation and supply activities and has transferred its distribution and transmission activities to wholly-owned subsidiaries. EDF has been and may be affected by the loss of control over certain strategic and operational decisions, which may have an impact on the outlook for and profitability of its transmission and distribution activities in France, in particular on transmission activities following transposition of the third directive in 2011 (see section 6.5 ("Legislative and regulatory environment")). At the same time, EDF will continue to bear certain risks associated with its operations, potential liability to third parties and factors that may affect the profitability of its assets.

The Group may face similar risks in countries where it owns or manages transmission or distribution networks and where it is subject to similar regulatory restrictions.

## **4.1.2 Risks associated with the Group's activities**

### **The Group operates facilities that may cause significant harm to the natural or human environment or for which accidents, natural disasters or external attacks may have serious consequences.**

The risks specific to nuclear facilities are described separately below in section 4.1.3 ("Specific risks related to the Group's nuclear activities").

Although the Group is not the owner of hydropower facilities, but only a concession holder, as the operator thereof, it is responsible for the safety of the facilities. The main risks associated with hydropower facilities and their operations are the risk of dams or associated hydropower facilities bursting, risks associated with operating the facilities during floods, the risk associated with flow or level variations due to the operation of the facilities and risks related to natural disasters, external attacks or malicious acts of any kind. During the construction and operation of hydroelectric facilities, the Group takes necessary accident prevention and safety measures (see section 6.2.1.1.4.2 ("Hydropower safety")) in conjunction with the public authorities. Nonetheless, the Group cannot guarantee that such events will never occur or that the measures taken will be fully effective in all cases, in particular, in dealing with external events (floods, natural disasters, negligence or malicious acts).

Persons working in or near electricity transmission and distribution facilities may, in the event of an accident, error or negligence, be exposed to the risk of electrocution. In this field, the Group also implements accident prevention and safety measures. However, the Group cannot guarantee that these measures will prove sufficient in all cases.

Questions concerning the risks to human health from exposure to electromagnetic fields (EMF), in particular, from power lines operated by the Group, have been raised both in France and abroad. Based on studies completed over the past 20 years, numerous international health organisations (including the World Health Organisation (WHO), the International Agency for Research on Cancer (IARC), the American Academy of Sciences, the American National Institute of Environmental Health Sciences (NIEHS) and the UK Health Protection Agency) consider, based on currently available scientific information, that the existence of health risks due to exposure to EMFs has not been proven. Various reports published in 2009 (Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR)) and 2010 (AFFSET and OPECST) do not change these conclusions. Since 2002, the IARC has classified low-frequency electromagnetic fields at

level 2B (possible carcinogen) on its evaluation scale of the carcinogenicity of substances. Furthermore, in a report published in June 2007, the World Health Organisation considers that health risks, if any, are low and that adopting arbitrarily low exposure limits is unjustified. In 2010, RTE, in conjunction with the French Mayor's Association, launched an information and measurement campaign on the subject of very low-frequency (50Hz) electromagnetic fields for the mayors of 18,000 municipalities that are crossed by high and very high voltage power lines. This joint campaign reinforces existing communication on EMFs and aims to respond openly to questions that neighbours may have about such structures. At this time, 30 years of research is available, but it cannot be excluded that medical knowledge about health risks related to exposure to EMFs may evolve, public sensitivity about such risks could increase or the precautionary principle could be applied very broadly. The French government supports and bolsters RTE's transparency efforts on this topic: in application of the Grenelle 2 Act of 12 July 2010, the decree of 1 December 2011 adopted a plan for controlling and monitoring electromagnetic fields emitted by high-voltage structures, pursuant to which measurements are to be made by independent laboratories and forwarded to the National Food, Environmental and Occupational Health Safety Agency (*Agence Nationale de Sécurité Sanitaire de l'alimentation, de l'environnement et du travail* or "ANSES"), which will publish them. According to the schedule adopted, the first phase of publication by ANSES will take place in the second half of 2014, but RTE also plans to publish these measurements online on its "key to the fields" information website dedicated to EMFs. Despite these efforts, the possibility remains that the EDF Group could be exposed to risks of increased litigation or that the issue lead to the adoption of more stringent and costly safety measures for the operation or construction of transmission or distribution networks (see section 6.5.6.1 ("Basic regulations applicable to the environment, health, hygiene and safety")).

More generally, the Group operates or has operated facilities which, as currently operated, could be or could have been the source of industrial accidents or environmental and public health impacts (such as inadequately controlled emissions, leakages in electricity supply lines insulated with pressurized oil, a failure of decontamination facilities, pathogenic micro-organisms, asbestos, polychlorinated biphenyls (PCBs), greenhouse gas emissions, etc.). In particular, large quantities of hazardous materials (in particular, explosive or flammable materials, such as gas and fuel oil) are stored in certain facilities. These facilities may be located in industrial areas where other activities subject to similar risks are conducted, which means that the Group's own facilities may be impacted by accidents occurring at neighbouring facilities owned by other operators and not under the Group's control.

In accordance with ISO 14001 (see section 4.2.2.4 ("Management of risks associated with industrial accidents or the environment or health impacts of the Group's activities")), the Group implements appropriate measures to prevent and, if necessary, repair any industrial accidents or environmental damage caused by the facilities that it operates. These measures are intended, in particular, to protect the Group not only from the risk of an accident (such as explosion, fire, etc.) occurring in its own facilities, but also from the impact of such an accident occurring in a neighbouring facility owned by a third party. However, in general, the Group cannot guarantee that the measures taken to control these risks will prove fully effective if any of the events listed above were to occur. An accident of the type described above could have serious consequences for persons, property and business continuity, and the Group could be found liable. Insurance policies for civil liability and damages taken out by the Group could prove to be significantly inadequate, and the Group cannot guarantee that it will always be able to maintain a level of cover at least equal to current cover levels and at the same cost. The frequency and magnitude of natural disasters seen over the past few years, in particular the nuclear accident that occurred in Japan in March 2011, could have a significant impact on the capacities of



the insurance and reinsurance market and on the costs of civil liability and damage insurance cover for the Group. Such accidents could also lead to the shutdown of the facility affected and, possibly, of similar facilities that may be considered to present the same risks.

Lastly, facilities or assets operated by the Group may be the target of external attacks or malicious acts of any kind. Safety measures were incorporated into the design of the facilities and sites, and protective measures have been taken by EDF. Moreover, safety measures to counter all forms of attacks have been implemented in conjunction with the public authorities. Nonetheless, like any safety measures intended to counter an external threat, the Group cannot guarantee that these will prove fully effective in all cases. An attack or malicious act committed on these facilities could have consequences such as injury to persons and damage to property, the Group being held liable on the grounds of measures judged to be inadequate and interruptions to operations. In addition, the Group cannot guarantee that European and national legislation regarding the protection of sensitive sites and critical infrastructure will not become more restrictive, which could generate additional investments or costs for the Group.

Any one of these events may have material negative consequences on the Group's image, activities, results and financial position.

**A significant share of the Group's revenue is generated from activities subject to regulated rates, and changes in such rates may have an impact on the Group's results.**

In France, a significant share of the EDF group's revenue depends on regulated rates that are set by public or regulatory authorities (integrated regulated sale rates and TURPE – see section 6.2.2.4 ("Tariffs for using the public electricity transmission and distribution networks ('TURPE')")). This method of setting rates with the participation of regulatory authorities also applies in other countries where the Group operates.

The principles defining rights to tariffs are described in the NOME law of 7 December 2010 and are listed in Articles L. 337-7 to L. 337-9 and Article L. 445-5 of the French Energy Code (see section 6.2.1.2.1.3 ("Regulated sales tariff contracts")). The public and regulatory authorities may decide to limit or block rate increases, yet require quality of service to remain unchanged. These authorities may also change the conditions of access for such regulated rates. Certain stakeholders may also challenge in court the decisions setting rates, to the Group's detriment.

The Group cannot guarantee that the statutes and regulations concerning such reversibility rights will not be extended beyond what is currently anticipated, or that other rate systems will not be adopted. The Group also cannot guarantee that the regulated or purchase rates will always be set at a level which would allow it to maintain its short-, medium- or long-term investment capacity or its property interests, while ensuring a fair return on the capital invested by the Group in its generation, transmission and distribution assets.

**EDF has certain obligations, in particular public service obligations, that are remunerated by mechanisms that may not provide complete compensation for additional costs incurred in connection with such obligations, or that are subject to change.**

The public service contract entered into by the French government and EDF on 24 October 2005 specifies the objectives and terms for performing the public service obligations that EDF is appointed to perform under Article 2 of Act no. 2000-108 of 10 February 2000, and also sets out the mechanisms under which EDF is compensated for the performance of these obligations (see section 6.5.2 ("Public service in France")).

EDF cannot be sure that the compensation mechanisms provided in the laws and regulations applicable to it for performing these public service obligations and adopting regulated rates will fully compensate additional costs incurred to perform such obligations and adopt such rates. Furthermore,

EDF cannot guarantee that these compensation mechanisms will never be subject to change or that existing mechanisms will fully cover potential additional costs that may be incurred in relation with new duties imposed on EDF in connection with its public service obligations.

The occurrence of any of these events may have an adverse impact on EDF's activities and financial results.

**The Group's activities require numerous administrative permits that may be difficult to obtain or that may be obtained only subject to conditions that may become significantly more stringent. Administrative appeals may also be filed against such permits, which may hurt the Group's business.**

The operation and expansion of the Group's industrial activities – generation, transmission and distribution – require numerous administrative permits, at both local and national levels, in France and abroad. The procedures for obtaining and renewing these permits can be drawn-out and complex. These permits are not obtained systematically and the requirements for obtaining them may change and are not always predictable. Even when these permits have been granted, stakeholders may file administrative appeals against them. Accordingly, the EDF group may incur significant expenses in complying with the requirements for obtaining or renewing these permits (for example, costs of preparing permit applications, investments associated with installing equipment required before a permit will be issued, setoffs of environmental impacts of structures to be built). This may also handicap the Group's industrial activities. Delays, overly high costs or the suspension of its industrial activities due to the inability to retain or renew permits may have an adverse impact on the Group's activities and profitability. In addition, the Group may also invest resources without obtaining necessary permits and authorisations and therefore have to cancel or withdraw from a project, which may have an adverse impact on its business, expansion or financial results.

**At times, the Group operates its generation, transmission, distribution or supply businesses pursuant to public service concession arrangements and it is not always the owner of the assets it operates.**

The Group does not always own the assets that it uses for its activities and, in such case, frequently operates them pursuant to a public service concession arrangement.

In France, for example, ERDF does not own all distribution network assets but operates them under concession agreements negotiated with local authorities (see section 6.2.2.2.2 ("Distribution activities")), which guarantee it the exclusive right to engage in expansion actions, operate the public electricity distribution network and supply electricity at regulated sales tariffs. Under the law, only ERDF can be appointed by local authorities to operate their distribution networks, except for networks operated by local distribution companies (LDC). Therefore, at this time, when a concession agreement is renewed, ERDF does not compete with other operators. However, the Group cannot guarantee that such provisions will not be amended by law in the future (see section 6.5.5 ("Public electricity distribution concessions")). Furthermore, the Group may not obtain the renewal of these contracts under the same financial terms and conditions (see section 6.2.2.2.2 ("Distribution activities")).

The law requires ERDF to deploy "smart" meters (Linky), although the financing mechanism has not yet been completely finalised (see section 6.2.2.2.5 ("Future challenges (renewal, development, smart meters)")).

In France, RTE is both the owner and operator of the public transmission system pursuant to the standard concession terms of reference signed by the Minister of Industry (Decree no. 2006-1731 of 23 December 2006 – see section 6.2.2.1 ("Transmission – Réseau de Transport d'Électricité (RTE)")) and section 6.5.4.2 ("French legislation: Energy Code")).

Hydropower generation facilities of 4.5MW or more are also operated under concessions awarded by the French government. When they expire, these concessions are now renewed by a competitive tender procedure (see section 6.2.1.1.4.4 ("Issues relating to hydropower generation")). In addition, the Water Act adopted on 30 December 2006 eliminated the preferential right of the incumbent concession holder at the time of renewal, and Decree no. 2008-1009 of 26 September 2008 provides the conditions under which concessions may be renewed. If an expired concession is not renewed, under current regulations, the incumbent concession holder will not receive any compensation. However, the 2006 Supplementary Finance Act provides for either reimbursement of non-amortised expenditures incurred for modernisation works or works for increasing generation capacity if such works are built during the second half of the concession's term.

In addition, in April 2010, the French government announced the scope of the hydropower concessions that will be renewed by 2015, thus confirming the decision to advance the expiry of certain concessions in order to group them by valley. Because some of these renewal deadlines have already been exceeded, in 2011, the Rhône-Alpes environmental, land planning and housing department (DREAL) updated the anticipated schedule for the first two concessions (Lac Mort and Drac). The schedule for renewing hydropower concessions should be updated in 2013, following publication of the programme Act on energy transition (see section 6.2.1.1.4.4 ("Issues relating to hydropower generation")). If the French government shortens the term of a concession, it may compensate the incumbent concession holder for the loss of revenue caused by the early termination of the concession, in accordance with the concession's terms of reference. When renewed, hydropower concessions are subject to an annual fee indexed to the revenue from sales of electricity produced by the concession hydropower facilities, which is paid to the French government and allocated to the departments through which the watercourses used flow. The Grenelle 2 Act of 12 July 2010 provides that the fee shall not exceed a limit set on a case-by-case basis by the concession grantor as part of each competitive tender.

The EDF group cannot guarantee that each of the concessions that it currently operates will be renewed, or that any concession will be renewed under the same financial terms and conditions as the initial concession. Furthermore, the Group cannot guarantee that the compensation paid by the government in the event of early termination of a concession's operations will fully compensate the Group's consequent loss of revenue, or that future regulations regarding the limitation of fees will not change in a way that could negatively affect the Group. These factors could have an adverse impact on its activities and financial results.

Outside France, the Group also operates under electricity distribution or generation concessions in other countries where it does business, particularly in Italy. Depending on the conditions in each country, the transmission, distribution or generation concessions may not be continued or may be renewed in its favour with changes to the financial terms and conditions of the concession terms of reference, which would have an adverse impact on the Group's activities and financial results.

**The Group must comply with increasingly restrictive environmental and public health regulations, which generate costs and are sources of potential liability.**

The Group's activities are subject to environmental protection and public health regulations, which are increasingly numerous and restrictive. These regulations relate to the Group's energy generation, transmission and distribution industrial activities, as well as to energy supply and energy-related services, which must, for example, incorporate the concept of demand management into their offers (for a description of the environmental, health and safety regulations applicable to the Group, as well as future regulations likely to have an impact on its activities, see section 6.5.6.1

("Basic regulations applicable to the environment, health, hygiene and safety")). Failure to comply with these regulations could expose the Group to significant litigation. The Group could be found liable, even if it is not at fault or has not breached applicable regulations. Furthermore, the Group may be compelled to compensate breaches, damage or injuries caused by entities that were not part of the EDF group at the time they were committed, if the Group thereafter takes over their facilities.

Furthermore, these regulations may be significantly reinforced by national or European authorities (see section 6.5.8 ("Principal planned regulations that are likely to have an impact on EDF Group's business")), which would have an adverse impact on the Group's activities and financial results.

Current regulations, and future changes to such regulations, have resulted and are likely to continue to result in an increasing level of operating costs and investments in order to comply with such regulations. The Group may even be required to close facilities that cannot be made compliant with new regulations. In addition, other regulations, which may be more restrictive or which may apply to new areas which are not currently foreseeable, may be adopted by the competent authorities and have a similar effect.

Lastly, stakeholders' external perception of the Group's sustainable development policy may change, resulting in a deterioration of the Group's non-financial rating and image.

**Changes to regulations concerning energy savings certificates (ESC) could impose additional obligations on EDF and generate costs in relation thereto.**

The energy savings certificates (ESC) measure, which was created by Programme Act no. 2005-781 of 13 July 2005 setting energy policy guidelines (POPE Act) and its implementing decrees, as amended by the Grenelle 2 Act of 12 July 2010, and which is now codified as Articles L. 221-1 et seq. of the French Energy Code, imposes energy savings obligations on energy suppliers.

In accordance with the conditions and procedures specified in the regulations, three-year energy savings objectives were established and allocated among persons subject to the obligation to achieve energy savings (the "obligors") on the basis of their sales volumes. This objective was 54 cumulative discounted TWh for the first period between 1 July 2006 and 30 June 2009. The second period covers 1 January 2011 to 31 December 2013 and the objective is 345 cumulative discounted TWh. Subject to financial penalties, payment of which discharges liability, by the end of the relevant period, obligors, including EDF, must produce energy savings certificates corresponding to their obligation, which are obtained in exchange for directly or indirectly carrying out energy savings actions, or which may be purchased from other so-called "eligible" economic entities through the national certificates register.

Due to its active involvement, EDF should meet the objective set for the second period. However, increased competition and a decrease in the principal mineral deposits associated with more stringent regulatory requirements have slowed the rate at which ESCs are produced and made them more expensive. This trend has been accentuated by the economic crisis, which has reduced households' investment capacity and hurt the construction sector.

Accordingly, considerably more stringent obligations may result from, firstly, the Energy Efficiency Directive adopted in October 2012 and, secondly, the French political decisions that may be taken as a consequence thereof if the existing measure is extended for a third period after 2014. These provisions could significantly increase EDF's sales costs and require a considerable increase in regulated sale rates. Because such rates are set by the public authorities, EDF cannot guarantee that increased sales costs will be completely reflected in the rates.

## **The expansion of an integrated European electricity market may be slowed by a lack of cross-border transmission system interconnections.**

The development of an integrated European electricity market is inhibited by a lack of cross-border interconnections. This situation limits exchange capacity between operators in different countries, in particular the capacity to rapidly adapt supply to demand (blackout risk), and allows price differences in different countries to persist, which would be significantly reduced in an efficient integrated European market. It also impedes the emergence of efficient operators with a European scope as it limits the possibilities for synergies between companies within a same group located on different sides of a border. Although there are currently several projects to develop interconnections, in particular between France and Spain and France and Italy (investments are determined by transmission network managers independently from producers), their construction has nonetheless been slowed down, mainly by environmental, regulatory and local acceptability considerations.

Furthermore, the lack of adequate interconnections between countries where the Group is based or the failure to develop such interconnections at an adequate pace may limit the industrial synergies that the Group strives to achieve between its various entities or may cause network interruptions in countries in which the Group is established, which could have an adverse impact on its results, business and outlook.

## **Repeated or widespread blackouts in France or in an area served by a Group subsidiary, particularly if they are attributable to the Group, may have consequences for the Group's activities, financial results and image.**

The Group may be the source of repeated or widespread blackouts or be blamed for such blackouts, even if the causal event occurred in another network or was attributable to another operator.

The causes of blackouts vary: local or regional imbalances between electricity generation and consumption, accidental interruptions to the power supply, cascading power failures (more difficult to circumscribe in a market with cross-border exchanges), interconnection problems at borders and difficulty in coordinating operators in a liberalised market.

The initial impact of such power failures would be repair costs incurred to re-establish power or restore the network. Power failures may also generate capital expenditures if it were decided, for example, to install additional generation or network capacity. This could also cause a decline in the Group's turnover. Lastly, power failures may have an adverse impact on the Group's image with its customers, particularly if the blackouts are attributable to the Group.

## **Natural disasters, significant weather changes and any major event on a scale that is difficult to predict may have a material adverse impact on the Group's industrial and commercial activities.**

EDF and its subsidiaries have developed crisis management plans to deal with natural disasters or major events. These crisis management plans are assessed and tested on a regular basis (see section 4.2.4 ("Crisis management")).

As was the case with storms Klaus (2009) and Xynthia (2010) in France, natural disasters (floods, landslides, earthquakes, etc.), other significant weather changes (droughts, etc.), or any other event on a scale that is difficult to predict (large-scale epidemics, etc.) may affect the Group's activities. Based on its experience with these types of events, the EDF group implements measures aimed at limiting the consequences should such events reoccur.

Such measures may generate costs in addition to the costs of repairing the damage caused by the natural disaster and the loss of earnings from the interruption to supply.

In August 2011, ERDF took out a five-year policy covering ERDF's aerial distribution network against the consequences of major storms risks. In the event of a loss, this cat-bond transaction, which affords cover in the amount of €150 million, provides compensation calculated using a parametric index based on wind speed. This cover was supplemented by a policy signed in December 2011, which increases total cover to €230 million (see section 4.2.3.5.3 ("Storm coverage")). Neither RTE's aerial distribution networks nor the Isolated Energy Systems are covered for property damage. Damage to these networks could have an adverse impact on the Group's financial position in the absence of insurance cover or if cover is inadequate. In addition, renewing or taking out these specific covers may be difficult or more costly due to the impact, frequency and magnitude of natural disasters experienced in recent years by the alternative risk transfer markets.

To deal with a wide-spread health epidemic, EDF has created a plan intended to ensure the continuity of electricity supply, depending on the intensity of the crisis, while guaranteeing the safety of facilities and reducing the health risks to which its employees are exposed.

Lastly, after its initial analyses following the Fukushima accident, EDF supplemented its crisis management organisation with the Nuclear Rapid Action Force (FARN), a national team capable of quickly delivering material and human assistance to a site in great difficulty (see section 6.2.1.1.3.3 ("Environment, safety and radiation protection")).

Despite having set up a crisis management structure that enables it to react promptly to such events (see section 4.2.4 ("Crisis management")), the Group cannot guarantee that the occurrence of a natural disaster, a weather event or any other event on a scale that by its nature is difficult to predict will not have material adverse consequences on its activities, income and financial position.

## **The Group is exposed to risks associated with weather conditions and seasonal variations in the business.**

Electricity consumption is seasonal and depends to a great extent on weather conditions. For example, in France, electricity consumption is generally higher during winter months. Furthermore, available power may also depend on weather conditions. Thus, low water levels or heat waves may limit nuclear power generation due to the requirement that rivers downstream of facilities not exceed maximum temperatures. Similarly, power generated by wind power or solar plants depends on wind conditions or hours of sunshine at the sites where such facilities are installed.

Therefore, the Group's results reflect the seasonal character of the demand for electricity and may be adversely affected by exceptional weather conditions or by wind or sunshine conditions that are less favourable than anticipated. In such case, the Group may have to compensate the reduced availability of economical power generation means by using other means with higher production costs, or by having to access the wholesale markets at high prices.

## **The Group's activities may be handicapped by unfavourable economic conditions.**

The Group's activities are sensitive to economic cycles and economic conditions in the geographical areas in which the Group does business. An economic slowdown in these areas would result in a drop in energy consumption, investments and industrial production by the Group's customers and, consequently, would have a negative effect on the demand for electricity and other services offered by the Group. Such economic conditions could, for example, threaten the profitability of certain of the Group's existing or planned power generation assets and/or weaken certain of the Group's counterparties.

The Group cannot guarantee that the effects of an economic downturn in the geographical areas where it does business will not have a significant adverse impact on its activities, operating income, financial position or outlook.



**Technological choices made by the Group may be outperformed by more efficient technologies.**

Although the Group at all times seeks to stay abreast of sustaining and disrupting technological innovations, the Group's business activities rely on a certain number of choices, which may be outperformed by other technologies that prove more efficient, more profitable, safer or more pertinent in light of possible future standardisation and standards than the technologies used by the Group. The use of such technologies by the Group's competitors could reduce or eliminate the competitive advantage that the Group has obtained from certain of its technologies, and thus have an adverse impact on its activities, financial results and outlook.

**The Group is exposed to risks associated with the wholesale energy and CO<sub>2</sub> emission allowances.**

In conducting its production and marketing activities, the Group does business in deregulated energy markets, primarily in Europe. Therefore, the Group is exposed to price fluctuations in the wholesale energy markets (electricity, gas, coal, petroleum products) and the CO<sub>2</sub> emissions allowances markets. These fluctuations are particularly significant in the current context of major tensions and volatility in the energy markets.

The Group manages its exposure to these risks primarily through purchases and sales on wholesale markets. With the exception of petroleum products markets, these are recent markets that are still under development. Therefore, a lack of liquidity may limit the Group's ability to hedge its exposure to risks in the energy market. Moreover, certain of these markets continue to be partially partitioned by country due to, in particular, a lack of interconnections. Furthermore, these markets may experience significant price increases or decreases that are difficult to foresee, as well as liquidity crises.

Energy market risks are managed in accordance with the "Energy market risks" policy adopted by the Group (see section 4.2.1.2 ("Management and control of risks associated with energy markets")). The Group hedges its positions on these markets through derivatives, such as futures, forwards, swaps and options traded on organised markets or over the counter. However, the Group cannot guarantee that it is totally protected, in particular against liquidity risks and significant price fluctuations, which could have an adverse impact on its financial results.

**The Group is exposed to fluctuations in the price and availability of materials and services (other than fuels) that it purchases in connection with its business operations.**

In the event of significant and sustained increases in the prices of raw materials, the Group may experience higher procurement costs for certain critical products or services. Such increases may also lead certain suppliers to reduce supply due to reduced profit margins. In addition, there is increased demand for certain equipment or services, which may have an impact on their availability, in particular equipment used for gas-fired combined cycle power stations, wind turbines and services and equipment in the nuclear sector.

**The Group is exposed to risks in the financial markets.**

As a result of its activities, the EDF group is exposed to risks in the financial markets:

- liquidity risk: the Group must at all times have sufficient financial resources to finance its day-to-day business activities, the investments necessary for its expansion and the annual appropriations to the dedicated portfolio of assets covering long-term nuclear commitments, as well as to deal with any exceptional events that may arise. Furthermore, in accordance with the practice in the organised energy and financial markets, some Group entities have set up a margin call system for certain over-the-counter transactions in order to limit counterparty risk. This system may require the Group to mobilise cash in the event of high volatility on financial and energy markets (see section 4.2.1.3.3 ("Liquidity risk"));
- currency risk: due to the diversity of its activities and the geographical distribution thereof, the Group is exposed to the risks of fluctuations

in foreign exchange rates, which may impact currency translation adjustments, balance sheet items and the Group's financial expenses, equity and financial results (see section 4.2.1.3.4 ("Currency risk"));

- equity risk: the Group is exposed to equity risk on securities held primarily as dedicated assets constituted to cover the cost of long-term commitments in relation with the nuclear business, in connection with outsourced pension funds and, to a lesser extent, in connection with its cash assets and investments held directly by the Group (see section 4.2.1.3.5 ("Equity risk"));
- interest rate risk: the Group's exposure to changes in interest rates involves two types of risks: (i) the risk of changes in the value of fixed-rate financial assets and liabilities and (ii) the risk of changes in cash flows associated with variable-rate financial assets and liabilities. Interest rate risk is also associated with debt securities held in connection with the management of dedicated assets constituted to cover the Group's long-term commitments in relation with the nuclear business and its commitments with respect to pensions and other specific employee benefits (see section 4.2.1.3.6 ("Interest rate risk")).

The manner in which these risks are organised and the management principles applied thereto are described in section 4.2.1.3 ("Management and control of financial market risks"), and the measures taken to control these risks are explained in section 9.5.1 ("Management and control of financial risks"). However, the Group cannot guarantee that it is totally protected, in particular in the event of significant fluctuations in foreign exchange rates, interest rates and the equities markets.

**A default by the Group's counterparties (partners, subcontractors, service providers, suppliers or customers) may have an impact on its activities and results.**

Like all economic operators, the Group is exposed to possible default by certain counterparties (partners, subcontractors, service providers, suppliers or customers). A default by these counterparties may impact the Group financially (additional costs, in particular if EDF is required to find satisfactory alternatives or take over the relevant activities or pay contractual penalties). Such defaults could also impact the quality of work performed, completion deadlines or the procurement of certain critical products or services, and exposes the Group to reputational risk, business continuity risk for certain projects or the loss of contracts.

The monitoring and oversight procedures applied within the Group in connection with its exposure to the counterparty risk inherent in its contractual relationships are described in section 4.2.1.4 ("Management and control of counterparty risk").

**The Group could be held liable for the occurrence of occupational illnesses or accidents.**

Although the Group has for many years taken the steps necessary to comply with the health and safety laws and regulations in the various countries in which it operates, and considers that it has taken the measures required to ensure the health and safety of its employees and of its subcontractors' employees, the risk of occupational illnesses or accidents cannot be excluded. The occurrence of such events may lead to lawsuits against the Group and may result in the payment of damages, which could be significant.

For a description of the measures taken by the Group with regards to ionizing radiation, see section 6.2.1.1.3.3 ("Environment, safety and radiation protection").

Regarding asbestos, the Group has taken measures to treat materials, as well as information and protection measures, as described in section 17.3 ("Health and safety – Quality of life at work – Subcontracting"). For a description of ongoing legal proceedings, see section 20.5 ("Legal proceedings and arbitration").

## 4.1.3 Specific risks related to the Group's nuclear activities

The EDF group is the world's leading nuclear operator<sup>1</sup>. Nuclear-generated electricity accounts for approximately 89.1% of the power it generates in France. Since 2009, EDF has also operated nuclear assets in the United Kingdom. In addition, the Group holds minority stakes in nuclear power plants in the United States (through CENG), Belgium and Switzerland, which it does not operate. The share of nuclear energy in the EDF group's electricity mix is thus a major competitive advantage. The Group also plays an active role in construction projects for new nuclear plants in France, the United Kingdom, China and potentially in other countries. Any event that has a negative effect on the nuclear business is likely to have greater consequences for the Group's image, activities, productivity, financial position and results than for its competitors that generate proportionally less electricity using this source of energy.

### **Due to its nuclear activities, the Group is exposed to substantial liability risks and potentially significant additional operating costs.**

Although the Group has adopted risk control strategies and procedures for its nuclear activities that are consistent with high standards, such activities, by their nature, still present potential risks. Therefore, the Group may face significant liability as a result of *inter alia* incidents and accidents, security breaches, malicious or terrorist acts, aircraft crashes, natural disasters (such as floods or earthquakes), equipment malfunctions or problems in the course of storing, handling, transporting, processing or packaging nuclear substances and materials. Such events could lead to significantly stricter operating requirements for nuclear plants, or to a partial or total halt of the operation of the Group's power generation plants, and may have serious consequences, especially in the event of radioactive contamination or irradiation of persons working for the Group, the general population and the environment, as well as a material adverse impact on the Group's activities, strategy, outlook and financial position.

A nuclear operator is responsible for the nuclear safety of its facilities. The liability scheme that applies to European nuclear facility operators, and the insurance applicable thereto, are described in section 6.5.6.2.2 ("Special regulations applicable to basic nuclear facilities") and section 4.2.3.6 ("Special insurance for nuclear facility operations"). This scheme is based on the principle of the operator's strict liability. Accordingly, if an event occurs that causes damage, the Group would be automatically liable up to a monetary maximum set by the law applicable in the country where the event occurs, regardless of the source of the event that caused the damage and any safety measures that may have been taken.

The Group cannot guarantee that in countries where it operates nuclear facilities the maximum liability set by law will not be increased or cancelled. For example, the protocols amending the Paris Convention and the Brussels Convention, which are currently being ratified (see section 6.5.6.2.2 ("Special regulations applicable to basic nuclear facilities")), provide for these maximum amounts to be increased. The entry into force of these amending protocols or any other reform that seeks to increase the maximum liability of nuclear plant operators could have a significant impact on the cost of insurance, which the company is not currently in a position to estimate. Furthermore, the Group cannot guarantee that insurance covering this liability will always be available or that it will always be able to maintain such insurance.

Property damage to EDF's nuclear facilities is covered by insurance programmes (see section 4.2.3.6.3 ("Damage insurance for nuclear facilities")). Despite this cover, any event that may cause significant damage

to a nuclear facility of the Group could have an adverse impact on the Group's business, financial results and financial position.

Lastly, the Group cannot guarantee that the insurers that cover both its liability as a nuclear plant operator and property damage to its facilities will always have available capacity or that the costs of cover will not significantly increase, particularly in light of the impacts on the insurance market of events such as the nuclear accident in Japan that occurred on 11 March 2011.

### **A serious nuclear accident anywhere in the world may have significant consequences for the Group.**

Despite the precautions taken in their design and operation, a serious accident at a nuclear facility cannot be excluded, such as the nuclear accident in Japan, following the earthquake and tsunami that devastated the north of the country on 11 March 2011. This type of accident may turn public opinion against nuclear power and lead the competent authorities to substantially tighten power plant operating requirements or to refuse authorisation for proposed extensions of the operating life of power plants, leading to a temporary or permanent suspension of the operation of one or more nuclear facilities, or leading the authorities to consider a moratorium on the use of nuclear power to generate electricity and, therefore, also to suspend or cancel all ongoing nuclear power plant development projects. Such decisions were taken in Germany (suspension of nuclear power generation) and Italy (suspension of nuclear power plant construction projects) following the Fukushima accident. Such decisions could be taken even if no accident occurs.

If such an accident were to occur near one or more of the Group's facilities, it could also contaminate the environment and thus jeopardise their operation.

Such events would have a material adverse impact on the business model, strategy, activities, results, financial position and outlook of the Group.

### **The Group's nuclear business is subject to particularly detailed and restrictive regulations that may become more stringent.**

The Group's nuclear business is subject to detailed and restrictive regulations, with a system in place, in particular in France, that monitors and periodically re-examines operating authorisations, primarily on the basis of nuclear safety, environmental and public health protection and national safety considerations (terrorist threats, in particular). These regulations may be significantly tightened by national and European authorities (for a description of the "Nuclear Package" and the French law on transparency and safety in the nuclear field, see section 6.5.6.2.2 ("Special regulations applicable to basic nuclear facilities")). Furthermore, the regulations may be tightened or possible non-compliance with current or future regulations could result in the temporary or permanent shutdown of one or more of the Group's plants.

Such events may result in a significant increase in the costs of the Group's nuclear power plants, which may have an adverse impact on its financial position.

### **For its nuclear business, the Group depends on a limited number of contractors.**

Although the Group has adopted a policy to diversify the suppliers and service providers for its nuclear business, it is currently dependent on a limited number of contractors and persons who have the necessary qualifications and experience. This limits competition in the markets in which EDF is a buyer and exposes the Group to the risk of a default of one or more of these suppliers or service providers with specific expertise, which could have an adverse impact on the Group's results and financial position (see section 4.3 ("Dependency factors")).

1. Source: *Nuclear Power Reactors in the World*, International Atomic Energy Agency, 2012 edition.

**The Group is exposed to changes in the conditions for procuring uranium and conversion and enrichment services.**

The Group's operating costs include nuclear fuel purchases.

For its nuclear power plants in France and the United Kingdom, EDF purchases uranium and conversion and enrichment services through long-term contracts containing hedging mechanisms that mitigate and smooth price fluctuations over time. Its main supplier is the Areva group, but EDF pursues a diversification policy by also buying supplies from other industrial companies (see section 4.3 ("Dependency factors") and section 6.2.1.1.3.4 ("Nuclear fuel cycle and related issues")). Prices and availability of uranium and conversion and enrichment services are subject to fluctuations due to factors that are mainly political and economic and that the Group cannot control (in particular, the profitability outlook of mining investments, imbalances between supply and demand or supply shortages associated with, for example, an operating accident in a uranium mine, delays in commissioning new mines or events leading to political instability in a uranium producing country).

In the United States, CENG purchases uranium and conversion, enrichment and assembly services from several suppliers. The current contracts with these suppliers ensure a supply of fuel and conversion, enrichment and assembly services for several years for the Calvert Cliffs, Nine Mile Point and Ginna plants.

However, the Group cannot guarantee that its contracts, in France and abroad, will completely protect it from sudden or significant price increases. The Group cannot guarantee that when these long-term contracts expire, it will be able to renew them, in particular at an equivalent price. This could have an adverse impact on the Group's financial results.

**To operate its nuclear power plants, the Group relies on proper functioning of road and rail transport, in particular for the transport of fuel.**

The transport of new or spent nuclear fuel is a very particular operation that requires specific and restrictive safety and security measures. These constraints could become more stringent, generating additional difficulties and costs for the Group. Furthermore, several factors that are beyond the Group's control (such as opposition by local residents or anti-nuclear associations, for example, in the form of manoeuvres to prevent nuclear material from being shipped) may slow these operations. Operations may also be interrupted, in particular, in the event of an accident. In such case, the Group may be required to slow or halt some or all power generation at the relevant sites, due to non-delivery of new fuel assemblies or the saturation of onsite storage facilities, which may have an adverse impact on the Group's financial results.

**The nuclear power plants that the Group operates may require significant or costly repairs or modifications.**

The group of nuclear facilities that the Group currently operates in France is highly standardised (see section 6.2.1.1.3.1 ("EDF's nuclear fleet")). This enables the Group to achieve economies of scale in equipment purchases and engineering, to apply improvements made to its newest power plants to all plants and, in the event of a malfunction in a facility, to anticipate the measures to be taken in other plants. However, such standardisation carries the risk of a malfunction that is common to several power plants or series of power plants (see section 6.2.1.1.3.2 ("Operation and technical performance of the nuclear fleet")). The Group cannot guarantee that it will not be required to make significant or costly repairs or modifications to all or some of its plants, or that events will not occur that may have an impact on the operation of its plants or their output or cause a temporary

or permanent shutdown of all or some of its plants. In particular, following the additional safety inspections carried out after the Fukushima accident, in 2012, the French Nuclear Safety Agency (ASN) issued a first set of technical instructions, which impose regulatory requirements based on the lessons learned from the Fukushima accident. Some of these requirements will have to be applied prior to the next safety re-evaluations and ten-year inspections. This work programme requires additional study, but it will involve additional investments over the next 15 years and bringing forward certain expenditures that were already planned before the accident (see section 6.2.1.1.3.5 ("Preparing for the future of the nuclear fleet in France")).

The Group operates or holds equity interests in nuclear power plants elsewhere in Europe, in particular the United Kingdom, as well as in the United States, and it may also be required to make costly repairs or modifications to these units or it could be faced with events that may impact their performance, power generation or availability. Like in France, safety authorities may take decisions that require additional works.

Despite the maintenance work carried out by the Group on its power plants, it is possible that certain plants may not operate at full capacity, in particular due to the age of certain equipment.

All such events may have an adverse impact on the Group's financial results and activities.

**The Group may not be able to obtain the authorisations necessary to extend the operating life of its power plants beyond the periods currently planned or it may not be authorised to operate its power plants until the end of such periods.**

In France, in connection with the studies associated with the third ten-year inspections of the 900MW units, in early July 2009 the ASN publicly stated that it had not detected any generic problem calling into question EDF's ability to ensure the safety of its 900MW reactors for up to 40 years. As required by the regulations, the ASN's position has been supplemented by a decision on each reactor following each of the third ten-year inspections (see section 6.2.1.1.3.5 ("Preparing for the future of the nuclear fleet in France")).

At the end of 2012, the Group assumed an operating life of 40 years for the purpose of calculating the accounting treatment associated with the operating life of its nuclear plants in France (depreciation, provisions, etc.).

However, the Group cannot guarantee that it will obtain all of the necessary authorisations at the appropriate times, or that such authorisations will not be subject to conditions that entail significant expenditures or investments for the Group.

To postpone construction of new units and the investments associated therewith, and to continue to receive cash flows from its existing fleet, the Group seeks to extend the operating life of its nuclear power plants in France beyond 40 years. In 2009, EDF submitted to the ASN the safety upgrades it was planning in order to extend the operating life of its fleet beyond 40 years. A first meeting was held with ASN in September 2010 to present the main proposals. On 18 and 19 January 2012, the ASN had these improvement proposals reviewed by the permanent "reactors" group, which judged these proposals positively, although it recommended that they be supplemented and, in certain cases, reinforced (see section 6.2.1.1.3.5 ("Preparing for the future of the nuclear fleet in France")).

The Group cannot guarantee that it will receive such extensions. Furthermore, such extensions could be obtained under certain conditions, the financial impact of which, in particular in terms of investments, could affect the Group's strategy with respect to extending the operating life of its power plants or the Group's ability to pursue its global investment strategy.

In the United Kingdom, the current projected operating life of EDF Energy's nuclear power plants ranges between 35 and 47 years on average for advanced gas-cooled reactor ("AGR") power plants and is 40 years for the pressurised water reactor. The objective is to increase the operating life of the most recent AGR power plants by 7 years and to increase the operating life of the PWR by 20 years (see section 6.3.1.7.2 ("Nuclear generation business unit")). However, in light of the safety rules applicable in the United Kingdom, the Group cannot guarantee that EDF Energy will obtain the necessary authorisations at the appropriate times to operate its existing nuclear power plants until the end of their currently projected operating life, or that such authorisations will not be obtained subject to conditions that entail significant expenditures or investments for the Group. Nonetheless, EDF Energy assumes the currently projected operating lives for the purpose of calculating the accounting treatment (depreciation, provisions, etc.) associated with the operating life of its nuclear plants in the United Kingdom (see section 6.3.1.7.2. ("Nuclear generation business unit")).

In the United States, the Nuclear Regulatory Commission ("NRC") granted an operating life of 60 years<sup>1</sup> to all CENG nuclear plants (which were commissioned between 1970 and 1988 (see section 6.3.3.2.2.1 ("Existing nuclear business units – Constellation Energy Nuclear Group (CENG)" – "CENG's nuclear activities (nuclear electricity generation and operation)"))). CENG is a joint venture created by EDF and Constellation Energy Group ("CEG"), to which the nuclear assets previously held by CEG were transferred. However, the Group cannot guarantee that these power plants will be actually operated for such period, particularly in the event of an incident affecting the safety or availability of the facilities.

If any of these events occur they may have a material adverse impact on the Group's financial results and financial position.

#### **A decision by the French public authorities to halt one or more nuclear power generation units could have material adverse consequences for the Group.**

The French President and the government have undertaken to reduce the share of nuclear power in France's electricity generation mix from 75% to 50% by 2025. Although this goal does not necessarily mean that other plants will be closed before the expiry of their useful lives, a decision to close one or more units early for other than industrial considerations cannot be completely excluded (regarding decisions concerning Fessenheim please refer to 6.5.8.2 ("Future regulations at national level")). Similarly, a decision to halt all nuclear power generation by a specific date can also not be completely excluded. Lastly, it may be decided that any new nuclear construction project, in which the Group has already invested considerable sums, should be halted. Such events would have material adverse consequences on the outlook, financial position, results and image of the Group, which would lead the Group to request compensation that it is not certain to obtain.

#### **Construction of EPRs may encounter problems or not be completed.**

The Group has undertaken construction of the European Pressurised Water Reactor (EPR) in Flamanville (see section 6.2.1.1.3.5 ("Preparing for the future of the nuclear fleet in France")) in order to renew its nuclear power generation facilities in France and to serve as a model for the construction of new facilities abroad.

The Group may not obtain the authorisations required for the construction, commissioning and operation of EPRs, or authorisations may be challenged by court rulings. In particular with respect to the Flamanville EPR, which is a "prototype" reactor, technical or other difficulties may occur during development and construction, or during early stages of the operation of the EPR. These difficulties could slow or prevent the construction of other

EPRs, alter the schedule for commissioning them or affect their performance. In addition, total construction costs could be higher than EDF estimates.

In December 2012, EDF submitted an upward cost revision for the construction of the Flamanville 3 project of €2 billion constant added to the previous estimate (July 2011) of €<sub>2008</sub>6 billion.

The first power generated available for sale is expected in 2016. The EPR programme is an essential component of the Group's strategy. Any event that delays or blocks this programme or affects the construction of the "prototype" EPR or subsequent units would thus have a material adverse impact on the Group's activity and financial position.

#### **The Group is responsible for most spent fuel and radioactive waste from its nuclear power plants, especially long life medium- and high-level waste from spent fuel.**

The nuclear fuel cycle is described in section 6.2.1.1.3.4 ("Nuclear fuel cycle and related issues"). In France, as an operator and waste producer, EDF is legally responsible for spent fuel from the time it leaves the power plant and for radioactive waste processing and long-term management operations. EDF assumes this responsibility in accordance with guidelines laid down by the public authorities and under their supervision.

The Group's liability may be alleged, in particular as a nuclear power operator or producer within the meaning of applicable legislation on waste, in the event of an accident or any damage to third parties or the environment from spent fuel or waste, even if they are handled, transported, kept, warehoused or stored by contractors other than the Group (especially, in France, the Areva group and ANDRA), in particular in the event of a breach by such contractors. If the Group were held liable for damage to third parties, the specific strict liability scheme applicable to nuclear plant operators would apply, up to the maximum amounts specified by this scheme (see section 6.5.6.2.2 ("Special regulations applicable to basic nuclear facilities")).

In France, the long-term management of radioactive waste has been the subject of various initiatives under the programme Acts of 30 December 1991 and 28 June 2006 on sustainable management of radioactive materials and waste (see section 6.2.1.1.3.4 ("Nuclear fuel cycle and related issues")). The Group cannot guarantee that all long-life high- and medium-level waste will constitute "final radioactive waste" within the meaning of Article 6 of the Act of 28 June 2006 and, therefore, that such waste may be directly stored in deep geological layers. Furthermore, the Group cannot guarantee the timeframe in which the public authorities will authorise such storage, or predict certain technical instructions related to such authorisations, which creates uncertainties about the future of such waste and the resulting liability and costs for EDF.

In the United Kingdom, when British Energy was restructured, agreements were entered into with the authorities concerning the management of certain radioactive waste from existing nuclear power plants (see section 6.3.1.7.2 ("Nuclear generation business unit" – "Costs related to radioactive waste management and plant decommissioning" – "British Energy group restructuring agreements")). Under the terms of these agreements, the liability and certain costs associated with the management of certain radioactive waste are transferred to the British government. However, EDF Energy Nuclear Generation Limited remains financially, technically and legally liable for the management, storage and processing of waste that does not come within the scope of the aforementioned agreements.

Directive no. 2011/70/Euratom of 19 July 2011 confirms the Commission's intention to establish a shared Community framework for the responsible and safe management of spent fuel and radioactive waste (see section 6.5.6.2.2 ("Special regulations applicable to basic nuclear facilities")).

1. Except for Nine Mile Point 2, which has an operating life of 58 years.



In the United States, in accordance with the Nuclear Waste Policy Act (NWPA), CENG is a party to the contracts entered into with the Department of Energy (DOE). In such capacity, since November 2009, CENG has paid the contributions stipulated by the NWPA to fund the cost of construction by the DOE of a federal storage site for final disposal of spent fuel (CEG paid these contributions until November 2009). Because the DOE has stated that it could not take possession of spent fuel before 2020 (instead of 1998 as originally planned), CEG has had to take additional actions, and incur the costs thereof, to provide onsite fuel storage, thereby allowing the operation of its plants until the federal storage site becomes available. The sums that the DOE will reimburse until the end of the transaction with EDF will be received by CEG. CENG will receive subsequent reimbursements (see section 6.3.3.2.2.1 ("Existing nuclear business units: Constellation Energy Nuclear Group (CENG)" – "Nuclear fuel")).

The Group cannot guarantee that it will have available, in a timely manner and under acceptable financial conditions, long-term storage and treatment solutions for the radioactive waste generated by the operation of power plants located in the relevant countries, which could have an adverse impact on the Group's financial results and financial position.

**Provisions booked by the Group for spent fuel processing operations and long-term radioactive waste management may prove insufficient.**

In France, EDF has booked provisions for spent nuclear fuel management operations (transport, processing, conditioning for recycling) (see note 29 to the consolidated financial statements for the financial year ended 31 December 2012) based on the price and volume conditions in the master agreement signed with Areva in December 2008 and broken down in an agreement signed on 12 July 2010, which covers the period from 2008 to 2012. Negotiations are underway with Areva to establish the processing and recycling terms and conditions as of 2013. The amount of provisions currently booked to cover the period after 2012 may prove insufficient if the terms under which this agreement is renewed for such future period prove more onerous than those currently applicable.

EDF has booked provisions for long-term waste management based on an assumption of geological storage, and on a reasonable interpretation of the work conducted in 2006 by a working group comprising ANDRA, the public authorities and nuclear waste producers (see note 29 to the consolidated financial statements for the financial year ended 31 December 2012 and section 6.2.1.1.3.4 ("Nuclear fuel cycle and related issues")). Although the programme Act of 28 June 2006 on sustainable management of radioactive materials and waste confirms, without excluding other areas for additional research, that "final radioactive waste" will be stored in deep geological layers, the Group cannot guarantee that all long-life high- and medium-level waste will be considered as such or within what timeframe this type of storage, if it is selected, can be used. Consequently, the Group's final costs for long-term waste management may exceed the provisions booked in its financial statements.

In the United States, CENG has also booked provisions to cover its long-term nuclear waste management commitments.

The Group cannot guarantee that the amount of these provisions will be sufficient. Determining the amount of these provisions is sensitive to assumptions made in terms of costs, inflation rate, long-term discount rate and payment schedules. Given these sensitivity factors, changes in certain parameters may require significant adjustments of the provisions booked. In such case, any insufficiency of provisions for long-term nuclear commitments may have a material adverse impact on the Group's financial results and financial position.

**Decommissioning existing nuclear facilities may present currently unforeseen difficulties or be much more costly than currently anticipated.**

Given the size of the Group's nuclear fleet, decommissioning presents a significant technical and financial challenge. Although the Group has assessed the challenges, in particular the technical challenges, involved in decommissioning (particularly decommissioning the first-generation power plants in France), and has identified the solutions to be developed, it has never decommissioned nuclear power plants similar to those currently in service.

In France and the United States, the Group has booked provisions to cover the anticipated costs of decommissioning and offloading last cores. Determining the amount of these provisions is sensitive to assumptions made in terms of costs, inflation rate, long-term discount rate and payment schedules. The timeframe and costs of these works also depend on administrative authorisations and the availability, at required times, of radioactive waste storage centres or other facilities required for conditioning or storing waste packages (see section 6.2.1.1.3.6 ("Decommissioning of nuclear power plants")). Given these sensitivity factors, changes in certain parameters may require significant adjustments of the provisions booked and, therefore, the Group cannot guarantee that the provisions booked will equal the costs actually incurred at the relevant time, which would have an adverse impact on the Group's financial results and financial position.

In the United Kingdom, under the agreements concluded in connection with the restructuring of British Energy, the costs of decommissioning EDF Energy Nuclear Generation Group Limited's existing nuclear power plants will be paid by the Nuclear Liabilities Fund. If this fund proves insufficient, these costs will be borne by the UK Government (see section 6.3.1.7.2 ("Nuclear generation business unit" – "Costs associated with radioactive waste management and plant decommissioning – British Energy group restructuring agreements")).

**Dedicated assets allocated by the Group to cover the costs of its long-term nuclear business commitments (such as radioactive waste and decommissioning) may prove insufficient and require additional expenditures.**

In France, as of 31 December 2012, the market value of EDF's portfolio of dedicated assets was €17.6 billion, compared to €15.6 billion on 31 December 2011 (see section 6.2.1.1.3.7 ("Assets available to cover long-term nuclear-related commitments (outside the operating cycle)")). These assets have been built up gradually in compliance with the deadlines and requirements laid down by the Act of 28 June 2006 on sustainable management of radioactive materials and waste and by the NOME Act of 7 December 2010. Provided various criteria are met, including a requirement regarding the level of coverage provided by provisions booked as of 29 June 2011, the NOME Act<sup>1</sup> grants a five-year extension (from 29 June 2011 to 29 June 2016) of the deadline by which the portfolio of dedicated assets must cover all long-term nuclear business commitments, as required by the Act of 28 June 2006 (see section 6.5.6.2.2 ("Special regulations applicable to basic nuclear facilities")) and note 48 to the consolidated financial statements for the financial year ended 31 December 2012).

These dedicated assets may prove to be insufficient at the time actual payment is required if true costs are different or if the timeframe for decommissioning and storage costs are modified, which could have a material adverse impact on EDF's financial position. Moreover, stricter regulations at the national level (in particular those that impact the base for determining the dedicated assets to be constituted by EDF) or European level may lead to more stringent requirements regarding the constitution of dedicated assets and have an effect on EDF's financial position.

1. Article 20, as amended, of Act no. 2006-739 of 28 June 2006, now codified as Articles L. 594-1 to L. 594-10 of the French Environmental Code.

Lastly, although these assets are constituted and managed in accordance with strict prudential rules (see section 6.2.1.1.3.7 ("Assets available to cover long-term nuclear-related commitments (outside the operating cycle)")), the Group cannot guarantee that price fluctuations in the financial markets will not have a material adverse impact on the value of these assets (see section 9.5.1.6 ("Management of financial risk on EDF's dedicated asset portfolio")) for a sensitivity analysis), which could require EDF to disburse additional amounts to restore the value of these assets.

In the United Kingdom, funds to finance nuclear commitments are managed by an independent organisation created by the UK government (Nuclear Liabilities Fund – NLF). Operators therefore have no assets to manage for this purpose (see section 6.3.1.7.2 ("Nuclear generation business unit")).

In the United States, in accordance with NRC regulations and requirements imposed by the relevant states, CENG has established funds strictly dedicated to covering the costs of power plant decommissioning. The strategy adopted in establishing these funds is based on the estimated costs necessary for decommissioning and the disbursement schedule associated therewith. CENG's estimate of the revenue generated by these funds is based on various factors, including the asset allocation strategy for the investments, the historical rate of return and market conditions. At this time, it is anticipated that decommissioning activities will continue until 2083. Any changes that affect decommissioning costs or schedules, or any changes that affect the revenues generated by the funds, may impact the ability of the funds to cover the decommissioning costs of power plants, which could lead CENG to incur additional expenditures.

Such events could have an adverse impact on the Group's financial position.

## 4.1.4 Risks related to the Group's structure and changes within the Group

### **The Group's expansion strategy may not be implemented in accordance with the objectives set by the Group.**

The Group intends to continue its expansion in the electricity, gas and energy services industries, both in France and abroad, in line with its industrial development plan, in accordance with its business model for each geographical area and in light of any relevant experience (upstream/downstream balance, marketing strategy, development of renewable energy sources or other production methods, such as nuclear, hydropower, coal, gas combined-cycle power plants, etc.). The Group thus implements programmes that focus on expansion, reorganisation, increasing profitability (see the discussion below of the risk factor entitled "The Group has set up programmes that aim to improve its operating and financial performance and increase its financial flexibility") and disposals.

In the field of nuclear power generation, the Group may not achieve the expansion it anticipates, or it may be unable to carry out projects it has initiated abroad or it may be unable to carry out such projects under satisfactory economic, financial and legal conditions.

Through partnerships or equity investments, the EDF group is committed to international projects for the construction and operation of nuclear power plants (in particular, in China and the United Kingdom). During the development phase, these projects require obtaining administrative authorisations, licences, permits and, in certain cases, setting up additional partnerships. These are major projects involving significant investment, and their funding conditions are subject to confirmation. Given the current economic climate, obtaining such funding may be delayed. Furthermore, the regulatory framework in some countries is in the process of being updated, which could have an impact on EDF's commitments and liability. Even when

it has negotiated protective contractual arrangements, the Group cannot guarantee that any or all of these projects will be carried out in accordance with the anticipated schedules, under satisfactory economic, financial, regulatory or legal conditions or that they will, in the long term, generate the profitability anticipated at the outset, which could have a material adverse impact on the Group and its financial position.

Furthermore, the expansion of the Group's gas business is an important issue, both in terms of the use of gas in power generation and the development of dual gas/electricity offers. The outlook for global supply and demand for gas is changing (the boom in unconventional sources of gas, particularly in the United States, rising demand in emerging countries, etc.). The competitive environment for the gas sector is evolving in France and in Europe with the emergence of new operators and the mergers of energy companies. The dependence of European countries on imports of natural gas is already high and continues to increase, due mainly to the depletion of local resources and increasingly distant supply sources. To implement its gas strategy, the Group must not only have access to competitive sources of supply, but also to logistical infrastructure (such as storage, gas pipelines and LNG terminals) that allow it to transport its gas to locations near points of consumption, have the requisite flexibility and generate synergies between the various entities of the Group, including those which it does not control. The Group cannot guarantee that it will always have access to gas supply sources (through long-term contracts or the acquisition of gas fields, for example) or to gas infrastructure, or that it will be able to generate the synergies anticipated. All of these factors may slow the expansion of the Group's gas strategy, which would have an adverse impact on its activities, financial results and outlook.

Lastly, the Group also intends to develop and reinforce its offer of integrated services, including eco-efficiency energy services, as part of a sustainable development approach. The energy services market is very competitive, and the energy efficiency market has strong development potential. The Group cannot guarantee that its service offer will be successful or that it will always be able to implement its expansion policy in this area, which may have an adverse impact on its financial results and outlook.

More generally, the Group may face unexpected changes in its regulatory, economic and competitive context, which may render its decisions inappropriate, or it may encounter difficulties in implementing or changing its strategy, which may have an adverse impact on the Group's business, financial results and outlook.

### **The Group's acquisition and disposal transactions carry risks and may not always achieve the objectives pursued.**

As part of its development strategy, the Group has carried out and may carry out transactions involving the acquisition of assets or equity interests, as well as mergers or the creation of joint ventures and, more generally, all types of external growth transactions.

External growth transactions involve *inter alia* the following risks: (i) the assumptions used by the Group in valuing an acquisition may not prove accurate, particularly concerning anticipated market prices, cost savings, profits, synergies and profitability; (ii) difficulties concerning the quality and performance of assets acquired may be encountered or the liabilities of acquired companies may be undervalued; (iii) difficulties integrating the businesses or companies acquired may occur; (iv) the Group may not be able to retain certain key employees, customers or suppliers of the acquired companies; (v) the Group may be required or wish to terminate certain pre-existing contractual relationships on costly or unfavourable financial terms; (vi) the Group may increase its debt to finance these acquisitions, limiting its financial flexibility and the opportunity to obtain additional loans in the future; and (vii) the Group may be required to make commitments to the antitrust authorities, which may be implemented on terms that are less favourable than anticipated by the Group.

Consequently, the benefits expected from future or completed acquisitions may be lower or may not be obtained as quickly as expected, which could have an adverse impact on the Group's financial results, financial position and outlook.

The Group has also carried out and may carry out transactions involving the disposal of assets or equity investments. In connection with such disposals, the Group may provide guarantees concerning the assets sold and, consequently, may have to pay compensation or make price adjustments to the purchaser, which could have an adverse impact on the Group's financial results, financial position and outlook.

The Group may also decide to not carry out external growth transactions and disposals it has planned, or to carry them out for a price other than the desired price, due *inter alia* to contractual, financial or regulatory limitations, or political intervention. This may have an adverse impact on the Group's financial results, financial position and outlook.

**The Group may not hold a controlling majority or it may share control in certain of its subsidiaries and equity interests.**

Certain of the Group's business activities are conducted, or may in the future be conducted, through entities in which the Group shares control or in which it is the minority shareholder. In such situations, the Group may experience a deadlock if the partners are unable to agree, or decisions may be taken that are contrary to its interests, which may limit the Group's ability to implement the strategies it has adopted and have an adverse impact on its business activities, financial results, financial position and outlook.

**The various reorganisations required by market liberalisation could have operational and financial consequences for the EDF group.**

The organisation that has been put in place since the market has been liberalised, in which regulated activities are separated from competing activities, may yet generate difficulties for customers that may impact the image of the Group and, in particular, the energy supplier.

**Risks associated with information systems.**

The Group operates multiple and highly complex information systems (servers, networks, applications, databases, etc.), which are essential for the conduct of its commercial and industrial business, and which must adapt to a rapidly changing environment. A failure of one of these systems could have significant adverse consequences for the Group. In particular, the EDF group's activities may be adversely affected if the information systems in place, to be put in place or to be adapted following full liberalisation of the market are not sufficiently reliable or productive.

Lastly, in general, the Group cannot guarantee that the policy of reinforcing information backup systems will not experience technical deployment difficulties or delays in implementation, which could, in the event of a serious incident, have a significant adverse impact on the Group's business, financial results and financial position.

**As the Group's majority shareholder, the French government may interfere in decisions that are important for the Group.**

Pursuant to Article L. 111-67 of the French Energy Code, the French government is EDF's principal shareholder and must retain ownership of at least 70% of its share capital. Under French law, a majority shareholder controls most corporate decisions, including resolutions that must be adopted by general meetings (in particular, the appointment and dismissal of members of the Board of Directors, the distribution of dividends and amendments to the articles of association). In addition, the legal restriction on dilution of the French government's stake may limit EDF's capacity to access capital markets or carry out external growth transactions.

**A non-negligible share of the Group's workforce is employed by organisations common to EDF and GDF Suez. Therefore, the Group depends in part on management mechanisms set up within these joint structures.**

A non-negligible share of the Group's workforce is employed by organisations common to EDF and GDF Suez (almost all of them by the joint department of ERDF and GrDF, the two distribution subsidiaries of the EDF and GDF Suez groups). Therefore, certain decisions made within these joint organisations can have an impact on EDF, in particular on its costs and on the manner in which its resources are managed. Furthermore, EDF and GDF Suez may have divergent interests or views concerning these joint structures, which may have an adverse impact on the Group's labour relations, financial results and financial position (see section 6.2.2.2.4 ("Shared services and international) – Relations between ERDF and GrDF within the common department")).

**The Group does business in numerous countries and may face periods of political, economic or social instability.**

Certain Group investments and commitments are exposed to risks and uncertainties associated with doing business in countries that may experience, or have experienced, periods of political or economic instability. Several countries in which the Group operates have regulations that are less advanced and less protective, practice or may introduce controls or restrictions on repatriation of profits and capital invested, levy or may levy specific taxes and fees affecting energy businesses and impose or may impose restrictive rules on the business of international groups. In these countries, the electricity sector is also subject to sometimes rapidly changing regulations or regulations which may be influenced by political, social and other considerations, which may affect the operations or financial position of Group subsidiaries in a way that is contrary to its interests. The occurrence of any of these events may have an adverse impact on the Group's activities, financial results and financial position.

Lastly, the Group has developed or built a portfolio of Independent Power Plants (IPP) in different parts of the world, including Brazil, Vietnam, Laos and China, in which it plays one or more roles (engineering, project owner, project manager, investor, operator). In these different capacities, the Group may incur liability or its financial performance may be affected, especially if the return on capital employed for the IPP is lower than expected, if long-term electricity contracts or pass-through clauses, if applicable, are challenged, or in the event of major changes to electricity market rules in the relevant country.

**The Group must continually adapt its expertise in a rapidly changing environment and renew a significant share of its workforce, while ensuring experience and skills are transferred to new employees.**

The challenges associated with achieving the Group's strategic objectives in a rapidly changing environment (in particular, the full liberalisation of markets, the international development of nuclear and "clean coal" power, the development of renewable energies, etc.) require continuously adapting and planning its expertise requirements, especially in functional and geographic areas.

In France, a large number of EDF employees reaches retirement age each year, despite the impact of the reform of the special pension scheme for Electricity and Gas Industry employees on average retirement age. For example, in the nuclear power generation and network maintenance sectors, approximately 40% to 45% of the workforce will be eligible for retirement within the next ten years. Although this situation represents an opportunity to adapt employees' expertise to the Group's new challenges, the renewal of this workforce requires planning the transfer of knowledge and involves competing in the market to recruit the most competent people (see section 17 of this reference document).

The EDF group considers skills development to be a major challenge and, therefore, takes all necessary measures to recruit, retain, redeploy or renew such skills in a timely manner and under satisfactory conditions. However, it cannot guarantee that measures adopted will always prove sufficient, which may have an impact on its activities and financial results.

**The Group may be required to meet significant commitments related to pensions and other employee benefits.**

The pension plans applicable in the various countries in which the Group operates involve long-term commitments to pay benefits to the Group's employees (see note 31 to the consolidated financial statements for the financial year ended 31 December 2012). In France, in addition to these pension commitments, the Group also owes obligations for post-employment benefits and long-term benefits for employees currently in service.

To cover these commitments, the Group has set up outsourced funds or pension funds, as appropriate. At the end of 2012, such assets only partially covered these commitments, although, for the Group, the maturity dates of these obligations are relatively smoothed over time.

The amounts of these commitments, the provisions booked, the outsourced funds or pension funds set up and the additional contributions required to make up insufficient funding are calculated based on (i) certain actuarial assumptions, including a discount rate subject to adjustment depending on market conditions; (ii) the rules governing retirement benefits paid out by the general retirement scheme; and (iii) amounts owed by the Group. These assumptions and rules may be adjusted in the future, which could increase the Group's current commitments for pensions and other employee benefits and, therefore, require a corresponding increase in provisions.

Furthermore, if the value of outsourced funds or pension funds proves insufficient to meet the corresponding commitments, in particular in the United Kingdom and the United States, primarily due to calculation assumptions or developments in the financial markets, the Group may be obliged to make additional contributions to the relevant funds, which may have an adverse impact on its financial position and financial results.

**Labour disputes could have an adverse impact on the Group's business.**

The Group cannot exclude that labour disputes or unrest, such as strikes, walkouts, claims or other labour disturbances, will not disrupt its business. The Group has not taken out any insurance to cover losses due to business disruptions caused by labour movements. Consequently, its financial position and operating results may be adversely affected by labour unrest.

**The Group has set up programmes that aim to improve its operating and financial performance and increase its financial flexibility. The objectives set for these programmes may not be achieved.**

The Group has set up and may set up programmes that aim to improve its operating and financial performance and increase its financial flexibility. For example, at the end of 2012, the EDF group initiated a new programme called "SPARK", which builds on the prior "Group Synergies and Transformation"

and "Operational Excellence" programmes, and which aims to optimise purchases relevant to both operating expenses and investments. The Group has identified areas offering potential gains of approximately €1 billion as of 2013. However, the Group cannot guarantee that the programmes to improve performance that it implements will have the expected results or that those results will be achieved on schedule.

**Risks associated with amendments to the IFRS standards applicable to the Group.**

The EDF group's consolidated financial statements for the financial year ended 31 December 2012 have been prepared in accordance with the international accounting standards published by the International Accounting Standards Board (IASB), as approved by the European Union as of 31 December 2012 (see note 1 to the consolidated financial statements for the financial year ended 31 December 2012).

This accounting standards framework is evolving and new standards and interpretations are currently in the process of being drafted or approved by the competent international bodies. The Group is studying the potential impact of these standards and interpretations, but cannot foresee their development or potential impact on its consolidated financial statements.

## 4.1.5 Risks associated with EDF's capital structure and the listing of its shares

**Significant volatility in share price.**

Stock markets have experienced significant fluctuations in recent years, which have not always been related to the performance of the specific companies whose shares are traded. Such fluctuations may significantly affect the EDF share price.

The EDF share price may also be significantly affected by a number of factors that affect the EDF group, its competitors, general economic conditions or the energy industry in particular, which may be due, for example, to political decisions concerning energy policy.

**Foreign exchange rate fluctuations.**

EDF shares are listed only in euros and any future payments of dividends will be made in euros. The equivalent amount in foreign currencies of the share price or of any dividends paid to an EDF shareholder could be adversely affected by a fall in the value of the euro.

**Risks associated with sales of EDF shares by the French government.**

As of 31 December 2012, the French government held 84.44% of EDF's share capital. If the French government decides to further reduce its equity stake in EDF, such sales by the French government, or the perception that such sales are imminent, could adversely affect EDF's share price.



## 4.2 Risk management and control in the EDF group

### 4.2.1 General system set up to manage and control the Group's risks

For many years, the EDF group has pursued a policy to manage its operational, financial and organisational risks (see "Report of the Chairman of the EDF Board of Directors on corporate governance and internal control and risk management procedures", in Appendix A to this reference document).

In 2003, given the changing context, the Group decided to implement an overall process to manage and control its risks, which reinforced existing measures, in particular by creating the Corporate Risk Management Division (*Direction Contrôle des Risques Groupe* or "DCRG").

The objectives of the risk management and control policy are to:

- contribute to securing the Group's strategic and financial progress by: identifying and ranking risks in all fields in order to ensure increasingly firm control thereof, increasing awareness and mobilising all Group entities to identify, assess and handle risks in order that all managers are aware of the risks inherent in their activities and take the actions necessary to control such risks;
- provide the Group's officers and directors and governance bodies with a consolidated, regularly updated view of major risks and their level of control;
- meet stakeholders' increasing need for information regarding management of the company's risks.

#### 4.2.1.1 Risk management and control principles

In general, the operational and functional entities are responsible for managing risks within the scope of their activity, under the responsibility of the Group's Executive Management.

The Group's risk control policy is applied either directly to EDF and its controlled subsidiaries or through the governing bodies of regulated subsidiaries (RTE and ERDF) or jointly-controlled subsidiaries.

This policy is based on a system of risk control that is completely independent of the risk management functions. This system ensures a standard approach with respect to the identification, assessment and control of risks.

Under those principles, every six months, EDF prepares a consolidated mapping of its major risks for the entities under its operational control or under joint control (except for Dalkia International), based on reports they provide. The consolidated mapping is approved every six months by EDF's Executive Committee and is presented to the Board of Directors' Audit Committee (see section 16.3 ("Bodies created by Executive Management")).

The risk mapping and control measures are closely associated with the Group's internal control and internal audit functions, and the audit programme is prepared on the basis of the major risks identified. The overall risk mapping process provides support for numerous other processes implemented by the Group, such as the policy concerning insurance and its implementation (see section 4.2.3 ("Insurance")), the crisis management

policy and the analysis of risks concerning matters examined by the Group's decision-making bodies (the Executive Committee, the Executive Committee's commitments committee, the upstream-downstream trading committee, etc.). The risk management process contributes *inter alia* to securing the investment and long-term commitments process by ensuring that matters presented to the Executive Committee's commitments committee comply with risk analysis methodology principles.

#### RTE

With respect to RTE, risk management and control are organised at the two relevant management levels:

- at the national level, every six months, RTE's Executive Committee approves the mapping of its major risks, which is then submitted to the economic oversight and audit committee of the RTE Supervisory Board. The Executive Committee tasks a national manager with monitoring each of the risks identified. RTE's Risk Audit management performs the national audits ordered by the Chairman of the Management Board, to whom it reports its findings and recommendations;
- at the level of RTE's various business lines, managers are responsible for conducting their own analysis of the risks associated with their businesses and for ensuring control thereof by implementing appropriate actions within the relevant entities. They monitor and report on these risks to the national level using an assessment system, the results of which are consolidated annually by the Audit and Risks Department of RTE.

#### ERDF

ERDF identifies and manages its risks in accordance with the Group's methodology. Risk control is implemented pursuant to the Group's control principles and is carried out by a unit that is independent of ERDF's operational entities, and which verifies, with reasonable certainty, control of its activities:

- a mapping of the major risks within ERDF's scope is updated semi-annually. After approval by ERDF's Management Board, it is submitted to ERDF's economic oversight and audit committee and to the Supervisory Board. A member of the ERDF executive committee is designated for each significant risk identified, and a national coordinator is tasked with implementing action plans covering related risks. An annual programme of national audits ordered by ERDF's Executive Committee, that is devised based on the risk analysis and overseen by ERDF's Audit, Internal Control and Risk department, supplements the control system;
- each regional operational division and each functional business line division is responsible for conducting its own analysis of the risks associated with its activities. For this purpose, it conducts an upstream risk analysis using the cross-disciplinary methodology applied within ERDF. Reports on internal control plans are submitted and consolidated at the national level.

The progress of the audit programme and the effectiveness of the improvement initiatives taken are also submitted for approval to the Management Board, and are presented semi-annually to the economic oversight and audit committee, and then to the Supervisory Board. An internal control report is approved and then presented each year to the same governance bodies respectively.

## 4.2.1.2 Management and control of risks associated with energy markets

Risk factors associated with wholesale energy markets and allowances are described in section 4.1.2 above ("Risks associated with the Group's activities").

### 4.2.1.2.1 System set up to manage risks associated with energy markets

As a result of the liberalisation of the end-user market, the development of wholesale markets and international expansion, the EDF group is exposed to fluctuations in market prices for energy, which may materially impact its financial statements.

Therefore, the EDF group has implemented an "Energy Markets Risks" policy concerning electricity, gas, coal, petroleum products and CO<sub>2</sub> emission allowances, which is applicable to EDF and entities under its operational control (see section 9.5.2 ("Management and control of energy market risks")).

In the case of Edison, an entity over which EDF has operational control since 2012, the energy markets risk policy is temporarily established by its governing bodies, but will ultimately be aligned with the Group's policy beginning in 2013.

In the case of Constellation Energy Nuclear Group (CENG), a jointly controlled entity, its "Energy Markets Risks" policy is reviewed by its governing bodies.

The objectives of the Group's "Energy Markets Risks" policy are to:

- establish a general framework pursuant to which the various Group entities carry out their operational activities (power generation, optimisation and distribution) and interact with EDF Trading;
- consolidate the exposure of the various entities over which EDF exercises operational control on the structured energy-related markets;
- implement a coordinated hedging policy at Group level.

The operational management principles applicable to energy market risks are based on clarifying responsibilities for managing energy market risks, making a clear distinction between matters that are under the responsibility of power generation assets management, on the one hand, and trading on the other hand.

Power generation and supply asset managers are responsible for implementing a risk management strategy that minimises the impact of energy market risks on their financial results. Nevertheless, they remain exposed to risks that cannot be hedged on the markets, in light of various factors such as a lack of liquidity or market depth, or uncertainty about volumes, which may have a significant impact on the Group's financial results.

Within the Group, positions on the energy markets are taken primarily by EDF Trading, which is the Group's trading entity. In such capacity, EDF Trading operates subject to a strict governance and control scheme (see section 6.5.7 ("Regulations on the wholesale energy market")).

The operational management principles applicable to energy market risks include management indicators, limits and position sensitivity scenarios that ensure control of these risks (see section 9.5.2 ("Management and control of energy market risks")).

### 4.2.1.2.2 Risk control organisation

For entities that are operationally controlled by the Group, the process for controlling energy market risks is based on:

- a governance and market risk exposure measurement system, clearly separating management and risk control responsibilities;

- explicit authority given to each entity, which defines *inter alia* hedging strategies and sets limits for related risks. This practice allows the Executive Committee to define each year a consolidated risk profile for this scope that is consistent with financial objectives and to direct operational management of energy market risks for a given market horizon (typically three years);
- a specific control process in light of their significant interactions with decisions taken within the power generation and supply businesses. This process involves the Group's Management and is based on a system of risk indicators and measurements that includes alert procedures in the event risk limits are exceeded.

In the case of jointly controlled entities, the control process is reviewed by the governing bodies of those entities.

The consolidated exposure to energy market risks of entities under EDF's operational control is submitted to the company's Executive Committee on a monthly basis. The control processes are regularly reassessed and audited.

## 4.2.1.3 Management and control of risks associated with financial markets

Risk factors associated with financial markets are described in section 4.1.2 above ("Risks associated with the Group's activities").

### 4.2.1.3.1 System set up to manage risks associated with financial markets

EDF has set up a system for managing financial risk (see section 9.5.1 ("Management and control of financial risks")), which defines the policy and principles for managing the Group's financial risks (liquidity, currency, and interest rate risks) and which are applicable to EDF and operationally controlled subsidiaries. The Group is exposed to equity risk through securities held for the purpose of managing its cash assets, dedicated assets to cover long-term nuclear commitments managed in a specific manner, outsourced employee benefit funds and direct equity investments. These principles include management indicators and limits for controlling these risks, and seek in particular to reduce the volatility of the Group's financial expenses.

All changes to the financial risk management system must be submitted to EDF's Audit Committee and Board of Directors for approval.

### 4.2.1.3.2 Risk control organisation

The Financial Risks Control and Investments Department (*Département Contrôle des Risques Financiers et Investissements* or "CRFI") is part of the Group Risk Management Department, which reports to the General Secretariat, thereby ensuring its total independence from the entities it controls. In particular, CRFI is in charge *inter alia* of controlling financial risks at the Group level by verifying proper application of financial management framework principles. It performs a first level control of the trading room for "cash" activities and of the Asset Management Division for activities associated with dedicated assets. CRFI is also tasked with carrying out a second level control (methodology and organisation) of EDF and entities under its operational control:

- with respect to controls of "cash" activities: CRFI provides daily monitoring of positions on the basis of risk indicators and submits reports thereon to line managers and the Finance and Treasury Director. In addition, a weekly report is made to the Operational Coordination Committee of the Finance and Investments Department (*Direction Financements et Investissements* or "DFI") of the corporate finance division. If limits are breached, corrective actions are decided by the mutual agreement of CRFI and the trading room. Any disagreements are referred to the Markets Committee of the corporate finance division, which, if applicable, decides on any specific changes to limits that may be necessary;

- with respect to controls of “dedicated asset” activities: CRFI provides monthly monitoring of positions and submits a monthly report thereon to the Operational Management Committee (which is chaired by the Finance and Investments Director). The risks assumed by the portfolio are discussed and, if necessary, actions to reduce risks are decided by this committee.

In addition, regular internal audits ensure that controls are properly in place. The internal control mechanism covers two levels of control:

- internal control exercised at the DFI level: an internal control coordinator who reports directly to the Finance and Investments Director is responsible for developing an annual internal control plan;
- the control exercised by the Group Audit Department, which plans yearly audits of activities connected with financial markets and financial risk control.

In addition, if necessary, EDF may hire external firms to audit the financial risk control procedures.

#### 4.2.1.3.3 Liquidity risk

The objective of liquidity management is to look for resources at the best price and ensure that they may be obtained at any given time. These factors are described in section 9.5.1.1 (“Liquidity position and liquidity risk management”).

EDF has set up regular monitoring of the Group’s liquidity risk, which is incorporated in the business management cycle, and includes stress tests. In addition, the Operational Coordination Committee reviews liquidity needs on a weekly basis.

During the financial crisis, EDF strengthened the monitoring and control of liquidity risk associated with margin calls on the financial and energy markets. Accordingly, specific risk indicators have been in place since 2009 to monitor liquidity needs associated with margin calls on the energy and financial markets. In addition, a steering committee monitors liquidity needs associated with energy market activities and decides, if necessary, on appropriate corrective measures to be implemented.

#### 4.2.1.3.4 Currency risk

To limit its exposure to currency risk, the Group has adopted the following management principles:

- foreign currency financing: to the extent possible given the local financial markets’ capacities, each entity funds its operations in its operating currency. When financing is contracted in other currencies, derivative instruments may be used to limit currency risk;
- asset-liability matching: the net assets of subsidiaries located outside the euro zone expose the Group to currency risk. On the consolidated balance sheet, currency risk on assets held in foreign currency is managed either by matching such assets with acquisition debt in the same currency or by hedging contracts involving the use of financial derivatives. Hedging of net assets in foreign currencies complies with a risk/return ratio. If no hedging instruments are available, or if hedging costs are prohibitive, the risk on open foreign currency positions is monitored by sensitivity calculations;
- hedging of operating cash flows denominated in foreign currencies: in general, the operating cash flows of EDF and its subsidiaries are denominated in their local currency, with the exception of cash flows related to fuel purchases which are primarily denominated in US dollars and, to a lesser extent, certain cash flows related to equipment purchases.

EDF and its main subsidiaries concerned by currency risk (EDF Energy, EDF Trading, Edison, and EDF Énergies Nouvelles) hedge firm or highly probable commitments related to these future operating cash flows.

The measurement of currency risk is described in section 9.5.1.3 (“Management of currency risk”).

#### 4.2.1.3.5 Equity risk

The management of this risk is explained in sections 9.5.1.5 (“Management of equity risk”) and 9.5.1.6 (“Management of financial risk on EDF’s dedicated asset portfolio”).

#### 4.2.1.3.6 Interest rate risk

To limit its exposure to interest rate risk, in connection with its general policies, the Group lays down principles for the purpose of limiting the risk of changes in the value of assets invested or of an increase in its financial expenses.

These principles are described in section 9.5.1.4 (“Management of interest rate risk”).

### 4.2.1.4 **Management and control of counterparty risk**

Risk factors related to counterparty risk are described in section 4.1.2 above (“Risks related to the Group’s activities”).

The EDF group is exposed to counterparty risk, which is defined as all losses that the Group would sustain on its operating activities and on the markets if any of its counterparties were to default and consequently fail to perform its contractual obligations.

Accordingly, a “Group counterparty risk management” policy, approved by the Board of Directors, is applied to EDF and the entities over which it has operational control. This policy organises the management and monitoring of counterparty risk, and lays out reporting procedures and channels.

Three major principles are at the heart of this system: (i) the organisation’s responsiveness; (ii) the independence of the risk control functions from the activities which generate risks; and (iii) the entities’ responsibility for the management of their exposures. The policy also sets a limit for the Group which is applied to each counterparty. In addition to this limit applied to each counterparty at the Group level, an additional limit for each counterparty was established in 2007, which is applicable to each EDF entity or subsidiary under the Group’s operational control. Use of counterparty limits is monitored regularly at the entity level, and the Group’s consolidated exposure to counterparty risk is updated quarterly for all controlled subsidiaries and monthly for all entities that are active on the energy or financial markets. The Group also actively monitors its major counterparties (see section 9.5.1.7 (“Management of counterparty/credit risk”).

In addition, in accordance with energy and financial markets practices, a margin call system has been adopted by certain Group entities to minimise counterparty risk.

RTE and ERDF subsidiaries that also make purchases on the energy markets to cover network losses also regularly monitor their counterparties and assign limits to each counterparty based on criteria defined by their governing bodies. In connection with its purchases on the energy markets to cover network losses, RTE also regularly monitors its counterparties based on criteria it defines.

## 4.2.2 Management of industrial and environmental risks

### 4.2.2.1 Management of nuclear safety risk

The risk factors associated with nuclear safety are described in section 4.1.3 above ("Specific risks related to the Group's nuclear activity").

Like other operators, the Group assumes responsibility for the nuclear safety of its facilities. Nuclear safety includes all technical, organisational and human measures that are intended to anticipate accident risks and limit the effects of an accident, and which are taken at every stage of the life of a nuclear power plant, from design to operation, until decommissioning.

The methods implemented in connection with the nuclear safety system have allowed continuous performance improvement in the protection of employees against the effects of ionizing radiation. The entire nuclear safety approach is continuously monitored, both internally and externally (see below and section 6.2.1.1.3.3 ("Environment, safety and radiation protection")), and the appropriateness of the organisation and measures in place are continuously re-examined, based *inter alia* on progress in knowledge and experience. Accordingly, the Group has always actively participated in the analysis of past accidents. Thus, the Group has been able to learn lessons from the accidents at Three Mile Island (1979) and Chernobyl (1986), which led to significant material and organisational improvements in the safety of nuclear facilities. This review is currently ongoing, incorporating feedback from the events which took place in Japan in March 2011. Based thereon, EDF quickly proposed several possibilities for improving safety based on the initial lessons learned from that accident, concerning (i) a reassessment of earthquake and flood scenarios; (ii) dealing with the simultaneous loss of electrical power sources and the cold source; and (iii) dealing with the fusion of the core.

#### In France

The construction of the Group's nuclear power plants has led to the adoption of safety procedures that, starting at the design stage, take into account risks that may arise during plant operation, whether associated with the operation of the facilities, internal or external attacks or natural disasters. These procedures rely primarily on the application of strict operating rules and on the Group's integrated skills (nuclear engineering, research and development), which allow planning ahead for resolution of possible failures, continuous assessment of equipment, regular re-evaluation of safety margins, technological monitoring and the implementation of new high-performance techniques.

Maintaining and improving safety also relies on the concept of in-depth defence, which provides for systematically handling the risk of technical, organisational and human failures by placing successive and independent lines of defence for facilities, processes and the organisation.

The operating quality and safety of the Group's French nuclear plants is ensured by multiple internal inspections, which are carried out *inter alia* by the Inspector General for nuclear safety and radiation protection, who reports directly to EDF's Chairman and Chief Executive Officer, as well as external inspections, which are carried out *inter alia* by the ASN, an independent administrative authority. Nuclear power plants must comply with terms of reference, the objectives of which are established and controlled by the ASN. The crisis management system to be implemented in the event of an accident is regularly tested through accident simulation exercises. Each year, approximately 100 exercises are organised for all French nuclear plants. Approximately ten exercises are carried out at a national level. The liability scheme applicable to European operators and the associated insurance are described in section 6.5.6.2.2 ("Special regulations applicable to basic nuclear facilities").

Following the Fukushima accident in March 2011, in September 2011, EDF submitted reports on the additional safety inspections of its facilities, as requested of all operators of nuclear facilities by the ASN (see section 6.2.1.1.3.5 ("Preparing the future of nuclear plants in France")). These reports reassess plants in operation or under construction and verify the safety margins in the event of extreme situations that may exceed the assumptions used at the time the nuclear facilities were designed or during successive safety reassessments. In early January 2012, the ASN submitted its report on the additional safety inspections to the Prime Minister and published it. The ASN deemed that the safety level of facilities inspected was sufficient and that no plant required an immediate shutdown. Nevertheless, to continue their operation, safety margins in the event of extreme situations has to be improved as soon as possible and, therefore, in June 2012, the ASN adopted a set of technical instructions that aim to improve safety in order to prevent risks associated with natural disasters, other industrial activities, supervision of subcontractors and dealing with non-conformities. EDF has prepared an action plan based on a "central core", which will be carried out over several years, and which will cover the additional studies and changes decided. This plan will be finalised when the ASN publishes its complete set of instructions. Moreover, immediately following its initial analyses of the Fukushima accident, EDF decided to supplement its accident management organisation with a national team capable of quickly providing material and human assistance to a site experiencing major difficulties. This team, called the National Rapid Action Force (FARN), is in the process of being set up and is scheduled to become operational in 2012. The FARN will back up the existing crisis management organisation (see section 6.2.1.1.3.3 ("Environment, safety and radiation protection")).

#### In the United Kingdom

The safety and reliability of EDF Energy's nuclear power stations is based on an approach that integrates the concept of in-depth defence, as from the design stage, through the technical characteristics of facilities and safety systems.

Maintaining and improving the safety of facilities in operation is ensured by implementing initiatives based on regular assessment of the risks that may affect plants, including extreme events. The main objective is to prevent the occurrence of any event that may cause radiation emissions that are potentially harmful to the public, EDF Energy employees or the environment.

Safety is also an integral part of the operating conditions imposed by the site licenses issued pursuant to the Nuclear Installations Act and enforced by the Office for Nuclear Regulation (ONR) and the Agency of the Health and Safety Executive (HSE). An ONR inspector is assigned to each power plant to monitor compliance with the conditions set by the site license, with the power to direct a shutdown if appropriate. The approach to plant safety is based on standards and strict operating procedures, professional expertise and a process of organising and planning tasks to meet exacting standards and ensure compliance with quality assurance standards in force for each activity.

Pursuant to the Nuclear Installations Act, the Ionising Radiation Regulations of 1999, and the Radiation Emergency Preparedness and Public Information Regulation (REPIPR), safe operation of power plants is ensured by accident prevention and control of crisis situations, while addressing the need to protect onsite personnel and the general public. It is therefore crucial, in accordance with licensing requirements, to be able to demonstrate to third parties and the public that the organisation set up to address any crisis situation has been thoroughly prepared, including through the training of personnel and conducting regular crisis drills. Local authorities and/or other external stakeholders must be consulted whenever these measures concern them.

Following the events in Fukushima, Japan, the UK Secretary of State requested the nuclear safety authority to prepare a report on the implications for the United Kingdom. Dr Weightman, the chief nuclear safety inspector, submitted his final report on 11 October 2011. The European Union also



required a programme of stress tests in the various member states, pursuant to which each nuclear operator was required to submit the details of its safety assessments to its national regulator, for onward submission to the European Union in 2012. The Weightman report concluded that there is no reason to curtail the operations of UK sites, although operators should continue to abide by the continuous improvement principle. The UK practice of regular safety reviews of licensed sites provides an effective means of ensuring continuous improvement in line with standards and technological advances. This report also concluded that there is not significant weakness in the UK nuclear licensing regime or safety assessment methods. Lastly, this report confirms that there is no reason to change current siting strategies for new nuclear power plants in the United Kingdom. The regulator stated that it was satisfied with the responses and plans initiated by the government and the nuclear industry in response to this report.

EDF's responses to the ONR in connection with the preparation of the Weightman report were incorporated into a comprehensive safety assessment, which was coordinated by a team of experienced nuclear safety professionals and verified by independent experts. This assessment confirmed the safe design of EDF Energy's nuclear fleet and the robust nature of its power plants, as well as their capacity to operate safely, even under the most extreme scenarios, including those whose likelihood of occurrence in the United Kingdom is extremely low. Nonetheless, EDF Energy has identified further means for enhancing the already very high current safety levels, which require investments in additional backup equipment for the cooling system electric supply, fuel pond cooling equipment, emergency commands and control equipment, as well as to provide additional training in accident management to key technical staff.

### In the United States

In the United States, the operating quality and safety of nuclear plants are monitored by the Nuclear Regulatory Commission (NRC). In addition, the Institute of Nuclear Power Operations (INPO), which includes all US nuclear operators, performs evaluations and analyses with the aim of achieving operational excellence.

CENG, a company controlled jointly by EDF and Exelon, has established a reporting system on operating quality and safety which is ongoing, as well as ad hoc in the event of an incident. CENG's management team provides ongoing reports to both parent companies, through the Board of Directors and the standing nuclear safety and operations committee, on the main results and key issues regarding operating safety and quality, and recommends corresponding improvement actions. In the event of a major incident, the CENG Chief Nuclear Officer directly informs the Board of Directors. CENG's communications officer also informs the EDF and Exelon communications officers.

The NRC has undertaken an experience analysis to gain an in-depth understanding of the Fukushima accident. Beforehand, it confirmed that the reactors in operation in the United States were safe and ruled out any shutdowns because there were no new confirmed risks. In fact, US operators had added defence systems after the attacks of 11 September 2001, which provide them with significant resistance to external aggression, as well as after the Individual Plant Examinations for External Events (IPEEE) that were carried out in the 1990s and which reinforced facilities, in particular with respect to seismic risks.

In early October 2011, based on a report of an ad hoc group of experts, the NRC set eight short-term priorities: reassessment of seismic and flood risks; mitigation of the risk of loss of electrical power; making additional mobile equipment available at sites; increasing reliability of boiling water

reactor venting lines; improving the instruments used in the spent fuel storage pools; reinforcing means of communication and crisis organisation; and improving procedures for managing serious accidents. In addition to these short-term actions, the NRC has focused on the need to reinforce the backup capacities of spent fuel storage pools, the venting capacities of pressurised water reactors and the filtering capacities of the venting lines of boiling water and pressurised water reactors, controlling hydrogen risk and analysing the total loss of the cold source.

On the basis of these guidelines and in close consultation with other operators, in the last quarter of 2011, CENG adopted and began to implement a three-year action plan. In December 2011, the NRC began consultations with the US industry to draft new regulatory requirements based on the Fukushima accident. The NRC has officially announced 2016 as the deadline for complete implementation of the lessons learned from the Fukushima accident.

### **4.2.2.2 Management of hydropower safety risk**

Risk factors relating to hydropower safety are described in section 4.1.2 above ("Risks associated with the Group's activities").

The Group operates hydroelectric facilities under concession agreements or administrative licenses. As operator, it is responsible for their safety.

There are three strategic activities in connection with the management of hydropower safety: monitoring dams and related facilities, managing structures during floods and managing flow or level variations (see section 6.2.1.1.4.2 ("Hydropower safety")). In order to further improve the management of these risks, in 1995, EDF initiated quality assurance procedures for these three activities in France and in the French overseas departments, which resulted in each of the Hydropower Operating Divisions obtaining ISO 9001 certification at the end of 2003. These certifications are the basis of a continuous progress program in hydropower safety management, and have recently been renewed by the certification authorities.

In addition, the detection, analysis of any incidents, implementation of corrective and preventive actions, feedback and experience sharing are the basis of the process for improving the safety level of the facilities. Continuing a process begun in 2005 to identify failure risks by type of equipment, and after a period in which certain problems caused facilities to be unavailable over the medium term (the Tuilières dam in Dordogne, etc.), EDF decided in 2006 to launch a program of technical upgrades and stepped-up maintenance of facilities in order to renovate certain sites and to maintain, on a long-term basis, a high level of hydropower safety and preserve the technical performance of its facilities in the future. This hydropower facilities renovation programme, known in French as "*Sûreté et Performance de l'Hydraulique*" (Hydropower Safety and Performance), or "SuPerHydro", has a budget dedicated to safety of €800 million for 2007-2016 (see section 6.2.1.1.4.3 ("Performance of hydropower generation facilities")).

Public information and outreach campaigns on the hazards of hydroelectric installations, initiated about ten years ago, are repeated each year. The breach of a dam or related facility may have serious consequences for persons and property located downstream. Facilities monitoring and maintenance, which are the principal measures to prevent the major risk of a dam breach, are carried out under the control of the French regional environmental, land planning and housing departments (DREAL). The 68 largest dams are covered by a special action plan implemented under the authority of the prefect, pursuant to the laws on major risks.

EDF has taken out general civil liability insurance policies to cover these risks (see section 4.2.3.3 ("Civil liability insurance (not including nuclear civil liability)")).

## 4.2.2.3 Management of risks associated with the Group's transmission and distribution facilities

The risk factors associated with the Group's transmission and distribution facilities are described in section 4.1.2 above ("Risks associated with the Group's activities").

Investments made in transmission and distribution installations take into account the safety of persons and property.

In addition, in France:

- With respect to third parties, the information campaign "Under aerial power lines, beware - keep your distance" has been thoroughly renewed, new partnerships have been established, including with the *Caisse Centrale de la Mutualité Sociale Agricole* (CCMSA) and the French Aerostat Federation. Communications have also been directed to non-profit associations and trade unions (fishermen, construction contractors, farm co-op funds, etc.) to remind the public of the hazards of using tools near aerial power lines. In addition, training for construction and public works professionals to reduce damage to installations has been expanded, with more than 50,000 such professionals and 15,000 municipal workers having been trained over the past four years.
- With respect to network operators and their contractors, work is done by personnel qualified under the UTE C 18-510 standard. Such personnel are trained to control electrical risk, and undergo periodic tests of their knowledge and checks by their superiors, particularly during site inspections. To maintain their certifications, personnel qualified to work in live voltage situations must also complete a minimum number of live voltage assignments, which varies by type of live voltage work.

## 4.2.2.4 Management of risks associated with industrial accidents or the group's environmental and health impacts

If not adequately managed, the Group's activities could cause industrial accidents or significant environmental and public health impacts.

Such risks of harm to the environment, the health of local residents or employees of the Group or its subcontractors are governed by increasingly stringent environmental and public health regulations. The corresponding risk factors are described in section 4.1.2 above ("Risks associated with the Group's activities").

The Group's environmental policy incorporates developments on major environmental issues, such as fighting climate change, adverse effects on biodiversity, etc.

Operational implementation of this policy relies on the deployment of an "Environmental Management System" in all of the Group's entities that have a direct or indirect influence on environmental impacts. The implementation of this Environmental Management System ensures improved management of the Group's knowledge of and compliance with regulations and anticipation of regulatory developments. This system has been ISO 14001

certified since April 2002 (see section 6.6.2.1 ("Organisation and ISO 14001 certification")). With respect to industrial accidents, the ISO 14001 standard requires taking a controlled set of planned and systematic actions, in particular, for prevention of major risks, emergency situation testing and safety management. In this regard, the Group has taken out a general civil liability insurance programme (see section 4.2.3.3 ("Civil liability insurance (not including nuclear civil liability)")).

Each year, an authorized organisation external to the EDF group carries out follow-up audits of the entities within the scope of the certification. In 2011, the renewal audit confirmed ISO 14001 certification, for a period of three years, of the Environmental Management System implemented by the Group.

## 4.2.3 Insurance

To protect its assets and limit the impact of certain events on its financial position, the EDF Group has dedicated insurance programmes that cover its major risks in terms of property damage, civil liability and insurance of persons. Nuclear risks are subject to the specific civil liability regime described below.

### 4.2.3.1 Insurance organisation and policy

The Insurance Division is tasked with developing the EDF group's insurance policy and organising its implementation throughout the Group in order to continuously optimise the total cost of its insurable risks<sup>1</sup>.

Its duties are to:

- continuously analyse cover for the EDF group's risks in conjunction with the Group Risk Control Department: analysis by business line, entity and project;
- establish rules for the Group's entire scope that enable covering all risks that can and must be covered, as well as optimising the total cost thereof and reducing volatility;
- promoting and applying these rules to all Group entities, using appropriate means and in compliance with governance rules; and
- developing and managing the tools necessary to perform the above tasks, including within the subsidiaries that report to the Insurance Division: EDF Assurances and the Group's captive insurance companies.

Entities and controlled subsidiaries sign an annual work programme, which has the following purposes:

- ensuring that all risks are insured;
- scheduling prevention inspections and overseeing implementation of the resulting recommendations;
- reviewing cover strategies and amounts declared (risk quantification);
- analysing losses and claims handling.

This work, which is performed by the network of insurance managers of the Group's entities and subsidiaries, improves the quality of information about insurable risks as programmes are renewed and prevention inspections are carried out (expert appraisal of maximum possible losses and insured values at numerous sites). In connection with prevention actions, the Insurance Division establishes and oversees implementation of the site inspections programmes.

<sup>1</sup>. Risks transferable to the insurance and alternative markets.

The Group's new insurance policy was approved by the Group Senior Executive Vice President, Finance in October 2012. It is periodically reviewed and approved by the Executive Committee and a report on its implementation is presented annually to EDF's Audit Committee.

### Objectives

The objective of the insurance policy is to reduce the total cost<sup>1</sup> of insurable risks for the entire Group, for an accepted risk level, while controlling its volatility.

The policy stipulates the risks that the Group decides to transfer to the market and the general principles for optimising such transfers: grouping purchases by setting up Group insurance programmes (common programmes for EDF and relevant subsidiaries), allocating risks between traditional markets and other types of cover (specialised mutual insurance funds, transfers to the financial markets, etc.), individual and Group excesses (in general, only major risks are transferred), optimising intermediation costs.

### Implementation methods

In 2011, the Group Senior Executive Vice President, Finance created a Strategic Insurance Policy Committee, which serves as a forum for discussing and setting policy regarding cover for major risks, including use of Group insurance companies. The Committee also provides an opportunity for the operational and financial teams to reflect on changes to and procedures for implementing the Group's insurance policy.

Information exchanges between the Group Risk Management Division (see section 4.2.1.1 ("Risk management and control principles")) and the Group's Insurance Division have been made systematic to ensure that both divisions have a view of the Group's risks that is consolidated and as comprehensive as possible. As a result of this shared view, EDF is in a position to look for cover appropriate for its insurable risks in accordance with the principles established by the Group in this area.

EDF has set up its Group insurance programmes and extended them broadly to its controlled subsidiaries, as well as offering them to its regulated subsidiaries of the RTE and ERDF networks, in order to, firstly, harmonise risk cover and rationalise its management and, secondly, control the corresponding insurance costs. In 2012, major subsidiaries were added (Edison, EDF Energies Nouvelles, etc.).

#### 4.2.3.2 Membership in international mutual insurance funds and insurance premiums

EDF is a member of the Oil Insurance Limited (OIL) mutual insurance fund, which covers the risk of damage (other than to aerial networks) to the Group's own property or property managed under concession (by EDF and its consolidated subsidiaries). OIL is an insurance mutual fund dedicated to the needs of businesses in the energy sector and provides its members with limited cover for property damage. The scope covered includes *inter alia* nuclear power plants (excluding nuclear accidents), fossil fuel-fired power plants, hydropower facilities and network substations.

In addition to this basic cover, EDF has taken out additional insurance to cover itself and many of its French and international subsidiaries.

EDF is also a member of the European Liability Insurance for the Nuclear Industry (ELINI) and the European Mutual Association for Nuclear Insurance (EMANI), which are mutual insurance funds that manage cover in this area for European nuclear power operators.

Moreover, membership in OIL has enabled EDF to provide Edison with the benefit of expanded covers for its exploration and generation businesses since 1 January 2013.

Total insurance premiums for EDF and Group programmes managed by EDF Assurances, for all types of cover, amounted to €111 million in 2012, compared to €100.45 million in 2011, not including insurance of persons, of which €62 million was paid by EDF and €18 million was for cover for ERDF aerial networks. EDF considers that the policies purchased under the Group's insurance management policy are in line with the current offer on the insurance market for operators of similar size and with similar operations around the world, particularly with regard to limits and excess amounts. The type as well as the price and amounts of insurance cover taken out are subject to change at any time depending on market conditions, the pace of deployment of insurance programmes and the EDF Board of Directors' assessment of risks and adequacy of cover.

In accordance with market practices, insurance policies include exclusions, policy limits and/or sub-limits.

#### 4.2.3.3 Civil liability insurance (not including nuclear civil liability)

EDF has taken out general civil liability insurance covering EDF, RTE, ERDF and EDF's controlled subsidiaries against the financial consequences of civil liability (not including nuclear damage) that they may incur in doing business as a result of damage caused to third parties. In particular, this programme covers the risks of civil liability associated with the operation of structures (hydroelectric dams, fossil fuel-fired power plants, substations and other network facilities), risks associated with development of the Group's renewable energy activities (wind, solar, etc.), as well as risks associated with environmental damage (emissions of solid, liquid or gaseous substances).

This cover is purchased to the extent of available capacity under acceptable financial terms on the insurance and reinsurance markets. Maximum cover is €1 billion. For this programme, the share of risk retained by the Group ("retention"), including the share of Wagram Insurance Company Ltd., an Irish insurance company wholly-owned by EDF, does not exceed €5 million per claim. Subsidiaries generally opt for lower excesses that are more in line with their financial capacity.

#### 4.2.3.4 Civil liability insurance for corporate officers and directors

EDF has concluded its civil liability insurance covering corporate officers and directors of EDF, RTE, ERDF and controlled subsidiaries of EDF against the financial consequences of their civil liability incurred in performing their management functions.

#### 4.2.3.5 Damage insurance (not including nuclear assets)

##### 4.2.3.5.1 Contractual damage programme

The scope of the contractual damage programme, which includes EDF, ERDF, EDF Energy and numerous other subsidiaries, was expanded to the assets of Edison as of 1 January 2013.

Wagram Insurance Company Ltd., together with other insurers and reinsurers, provide extensions of cover (property damage and operating loss bringing the maximum up to €1 billion) in addition to the covers provided by OIL.

1. Cost of losses (accepted or sustained) + cost of insurance/transfer + intermediation and management costs + prevention costs.

For this contractual damage programme, the Group's retention per claim, including the excess (which varies by subsidiary) and the share of the risk retained by Wagram Insurance Company Ltd., does not exceed €25 million.

This programme provides cover for operating losses for most subsidiaries, but not for EDF itself, in the event of property damage. The actions and measures taken to prevent industrial and environmental risks and limit their impact are described in section 4.2.2 ("Management of industrial and environmental risks").

RTE has taken out specific contractual damage insurance for its own property, not including electrical lines (substations and technical buildings and facilities).

#### 4.2.3.5.2 Cover for "construction" risks

EDF has taken out insurance policies covering specific construction risks (contractors' all-risk/construction all-risk policies). These policies are not included in any Group programme but are purchased on an ad hoc basis for major construction projects, such as the Flamanville EPR, the construction of combined cycle power plants, dams, combustion turbines, etc.

These covers are specifically monitored and are renegotiated if unforeseen events occur during the construction projects.

#### 4.2.3.5.3 Storm cover

On 11 August 2011, ERDF took out a five-year policy with Natixis covering ERDF's aerial transmission network against the consequences of exceptional storms. This "cat-bond" provides maximum cover of €150 million, and in the event of a loss will pay parametric-based compensation tied to a wind-speed index.

This cover was supplemented by a policy signed on 16 December 2011 with Swiss Re, which increases total cover to €230 million.

Term for setting up insurance cover for damage to the aerial distribution networks of Island Energy Systems is under study.

### 4.2.3.6 Specific insurance for nuclear facility operations

#### 4.2.3.6.1 Civil liability of nuclear facility operators

##### Current situation

EDF's current insurance policies are in compliance with French Act no. 68-943 of 31 October 1968, as amended by Act no. 90-488 of 16 June 1990, which codified the civil liability obligations imposed on nuclear facility operators by the Paris Convention (see section 6.5.6.2.2 ("Special regulations applicable to basic nuclear facilities")). To guarantee availability of the funds to meet such obligations, EDF took out insurance policies with Allianz and the European Liability Insurance for the Nuclear Industry (ELINI), which provide cover equal to the limits of liability set by law in the event of an accident at a nuclear facility.

For onsite accidents, total cover is €91.5 million per nuclear accident. This limit is available on a maximum of two occasions per site within a three-year period. In accordance with the law, these policies do not include any excess. Océane Re, a Group reinsurance company, shares this risk through reinsurance agreements entered into with Allianz and ELINI.

EDF Energy operates nuclear plants in the United Kingdom. In the UK, the liability scheme applicable to operators of nuclear facilities is similar

to that in France. EDF Energy is insured with Nuclear Risk Insurers Limited (NRI), the British nuclear insurance pool, for £140 million. This amount is the current limit of civil liability applicable to nuclear plant operators in the United Kingdom.

Moreover, in the USA, the specific regime imposed by the Price-Anderson Act applies in the event of a major nuclear accident (higher than \$300 million).

#### Foreseeable changes

Protocols amending the Paris and Brussels Conventions were signed on 12 February 2004. Act no. 2006-686 of 13 June 2006 on transparency and safety in the nuclear field provides for the transposition of these protocols into French law as of the date they come into force (see section 6.5.6.2.2 ("Special regulations applicable to basic nuclear facilities")). At such time, EDF will be required to adjust its insurance cover to meet the new guaranteed maximum compensation of €700 million for liability of nuclear facility operators. A government bill prescribing the procedures for transposing the Paris Convention, as amended, and the new amounts to be applied may be reviewed by the Parliament in the second half of 2013 upon conclusion of the energy transition debate.

In March 2012, in response to a survey on implementation of the amendments to the Paris Convention, the British government announced that the obligation of British operators would be raised to €700 million and gradually increased over a five-year period to a total of €1.2 billion after the law had been adopted by the British parliament.

The Group is currently studying possible cover solutions (nuclear insurance pools, mutual insurance funds, etc.) in order to be ready to implement them when the requirements come into force. Consequently, EDF and British Energy are founding members of Blue Re, a European mutual reinsurance company created on 17 June 2011 that specialises in covering these risks.

For more information on the laws governing nuclear power plant operators' civil liability, see section 6.5.6.2.2 below ("Special regulations applicable to basic nuclear facilities").

#### 4.2.3.6.2 Civil liability for transport of nuclear substances

Under the Paris Convention, the operator that is the "shipper" is liable for transport of nuclear substances and such liability is currently limited to €22.9 million. This amount is likely to be revised when the amended Paris Convention comes into force.

Therefore, prior to such transposition, insurance for 2013 has been renewed on the bases in effect for 2012.

#### 4.2.3.6.3 Damage insurance for nuclear facilities

In addition to the cover obtained through EDF's membership in the OIL mutual insurance fund, property damage (including following a nuclear accident) to EDF's nuclear facilities in France and to EDF Energy's nuclear facilities in the United Kingdom, as well as nuclear decontamination costs, are covered by a joint insurance programme underwritten by the NRI British insurance pool, insurers, some of which are reinsured by the French nuclear pool (Assuratome), and the EMANI, which has total capacity of €1,750 million, over and above an amount of US\$320 million. The Group programme covering power plants in France and the UK was renewed on 1 April 2012.

Furthermore, in connection with CENG's activities in the USA, EDF Inc. became a member of Neil<sup>1</sup>.

<sup>1</sup>. Nuclear Electric Insurance Limited.



## 4.2.4 Crisis management

The EDF group has a crisis management policy that is designed to enable it to manage situations in which its assets, business, personnel, activities or image are threatened by a foreseen or unforeseen event.

For this purpose, the EDF group ensures that it all times has the means available to respond to a crisis. A warning system is in place to immediately inform the company's executive management of any event that could potentially justify a decision to treat a situation as a Group crisis.

The crisis structure is based on crisis plans that are developed by the relevant divisions or entities, and which are specific by type of crisis (imbalance between generation and consumption, incidents affecting information systems, malicious acts, public health crisis, technical incident at a power generation facility, labour unrest, etc.), but which are consistent with the framework established by the Group's crisis structure.

In each entity, crisis management training is provided and structures are tested through crisis drills. A crisis drills programme is established each year at Group level (an average of two to three crisis drills per year involving the Group's crisis unit), in addition to the crisis drills organised by the divisions or entities (for example, 15 drills per year and per nuclear site).

Furthermore, following the Fukushima accident, EDF supplemented its national crisis teams with a National Rapid Action Force (FARN) capable of quickly delivering teams with "operational/maintenance" and "logistical" expertise to a nuclear power generating centre in difficulty (see section 6.2.1.1.3.3 ("Environment, safety and radiation protection")).

## 4.2.5 Ethics and oversight

The fact that the Group does business in many countries requires that it pay particular attention to compliance with the values and principles associated with the human and social rights derived from international laws and treaties. In addition, EDF believes that maximising its economic performance is inextricably linked not only to its environmental performance, but also to its social and ethical performance and, therefore, is particularly vigilant in ensuring that ethical and societal issues are considered in the conduct of its business.

### Group Ethics Code

With this in mind, EDF has established an ethics policy, which was submitted to the Board of Directors in March 2003 and which is coordinated by an ethics officer. This policy is based on the Ethics Guide, an internal code of conduct.

Based on the Group's five key values (respect for individuals, respect for the environment, maximising performance, solidarity and integrity) and the international commitments on which the ethics policy is based (the Universal Declaration of Human Rights, the ILO conventions, the OECD Guidelines) or to which the Group is a signatory (United Nations Global Compact, the EDF International Agreement on Corporate Social Responsibility, which was

signed in 2005 and renewed in 2009), the Ethics Guide sets out the standards for EDF's actions vis-à-vis its stakeholders, as well as the standards expected of employees in their professional conduct (standards for collective action as well as individual guidelines).

This document was updated in late 2007 and is distributed to all EDF branches and divisions. A copy of the Ethics Guide is given to each employee personally by his/her manager and is followed up by educational actions to ensure employees adopt it, both individually and as a group. Ethics coordinators are appointed to ensure the Guide is distributed and to monitor compliance with the Group's values in the field, thus reinforcing the existing ethics structure. The Group's values and the Ethics Guide are available on the EDF website.

In 2011, a new Group Ethics Code for all Group entities was approved by the Group's Management Committee after a period of work with each EDF subsidiary. This Ethics Code is in the process of being translated into the language of each relevant country, taking account of cultural differences between countries, in particular via a stage in which it is tested with groups of employees in each of the Group's entities. Thereafter, it will be deployed throughout the Group in 2013.

In addition, EDF's Board of Directors has set up an ethics committee which ensures *inter alia* that ethical considerations are taken into account in the Board's work and in the management of the company (see section 16.2.3.4 ("Ethics Committee")). The ethics officer reports annually on his/her activities to the Ethics Committee.

### Whistleblower system

A whistleblower system was established in 2004 to allow employees to contact the ethics officer with any questions, reports or complaints of an ethical nature.

### Combating fraud – Competition rules

Preventing and combating fraud, including corruption, is a major concern of the EDF group. On 14 September 2010, the Chairman signed a decision concerning combating fraud within the EDF Group, together with a Good Practices Guide. Furthermore, with respect to the detection of fraudulent practices and corruption, the Good Practices Guide, which builds on the Group's internal control guide, provides guidelines to the internal control manager, acting in conjunction with entities' ethics officers, for raising managers' awareness as to actions to be taken to prevent and control fraud, as well as on how to handle possible cases of fraud.

Lastly, EDF has strengthened its policy of education, training and monitoring compliance with competition rules. Starting in 2011, a training programme on competition rules has been offered to as many line managers as possible in France and abroad, in all subsidiaries. This programme consists of distributing materials and internal publications, building channels to effectively spread a culture of competition within the Group and fostering accountability among line managers for compliance with these rules. Control processes will be developed to supplement this mechanism.

### 4.3 Dependency factors

The EDF group does not consider itself to be dependent on any single customer.

With regard to suppliers, EDF and ERDF used 24,720 suppliers in 2012 (compared with 21,853 in 2011 and 20,772 in 2010). The top five suppliers of EDF and ERDF accounted for 14% (27.1% in 2011 and 14.5% in 2010) of total EDF<sup>1</sup> and ERDF purchases, and the top ten suppliers accounted for 18.9% (30.9% in 2011 and 9.2% in 2010).

Certain suppliers and subcontractors that provide products or services that the Group purchases in conjunction with its operations cannot be replaced. The issue of EDF's dependency vis-à-vis its suppliers arises primarily in the nuclear sector and, to a lesser extent, in IT and telecommunications.

The EDF group has developed expertise as an architect-builder of its power generation plants and as a nuclear fuel cycle integrator, which gives EDF technical expertise that is independent of that of its suppliers.

Lastly, the EDF group has a very important commercial relationship with the Areva group, which is involved in each phase of the nuclear fuel cycle. The Areva group is also active in the construction, equipping and maintenance of nuclear power generation plants. In France, the Areva group is EDF's main supplier in the nuclear sector. Accordingly, EDF considers that there is a situation of interdependence with the Areva group.

#### Nuclear fuel cycle

The relationship between EDF and the Areva group with respect to the fuel cycle is governed by multi-year contracts.

For the front end of the nuclear fuel cycle (see section 6.2.1.1.3.4 ("Nuclear fuel cycle and related issues" – "Front end")), EDF still relies to a large but decreasing extent on the Areva group, which accounted for approximately 35% of EDF's upstream purchases in 2012, compared with approximately 40% in 2011:

- For its natural uranium needs, EDF follows a policy of diversifying the origins and suppliers of supply sources. The Areva group continues to be an important supplier to EDF in this area.
- In terms of the nuclear conversion process, a significant share of EDF's needs are met by the Areva group's Comurhex factory, which competes with other global suppliers.
- In the field of uranium enrichment, EDF relies to a great extent on Areva. In 2008, EDF and Areva entered into a long-term contract that sets forth the terms under which, starting in 2013, EDF will acquire a portion of the production of the Georges-Besse II plant. However, to improve as quickly as possible the competitiveness of its supply through a growing share of ultracentrifugation enrichment services, since 2006, EDF has covered a significant share of its needs using other uranium enrichers on the market (see section 6.2.1.1.3.4 ("Nuclear fuel cycle and related issues")).
- With respect to enriched reprocessed uranium, EDF relies on the Areva group for certain types of services and on foreign suppliers (Tenex and Urenco) for other types of services, including enrichment.

- EDF uses two suppliers to manufacture fuel assemblies: Areva and Westinghouse Groups.

All spent fuel management operations for power plants in France are carried out in the Areva group's plant at La Hague. These operations, as well as the recycling of processing by-products, are carried out in accordance with the EDF-Areva master agreement of 19 December 2008. Pursuant to this master agreement, on 12 July 2010, a processing-recycling agreement and a protocol for waste recovery and treatment and the permanent shutdown and decommissioning of the La Hague plant (RCD-MAD/DEM protocol) were signed with Areva. For the 2008-2012 period, the processing-recycling agreement sets the prices and quantities of the services that EDF has appointed Areva to perform. Negotiations for the period after 2012 have been initiated. The RCD-MAD/DEM protocol establishes EDF's contribution to the costs of decommissioning the facilities at La Hague, and sets the full and final amount that EDF is to pay Areva. The last payment was made in 2011 (see note 49.2.3 to the consolidated financial statements for the financial year ended 31 December 2012).

With respect to the back-end nuclear fuel cycle, see section 6.2.1.1.3.4 ("Nuclear fuel cycle and related issues" – "The back-end cycle in France").

#### Power plant development and maintenance

The Areva group is EDF's main supplier of power plant construction and maintenance services. In particular, the Areva group supplies nuclear boilers, the corresponding safety studies and spare parts. In 2011, EDF signed two major contracts with Areva, one for the production of 32 of the 44 steam generators for the 1,300MW segments, and the other for the renovation of the control-command systems for the 1,300MW reactors. Nevertheless, a diversification program has been underway for several years, in particular, with Westinghouse and Mitsubishi, for the replacement of certain major components (12 of the 44 steam generators for the 1,300MW segments will be provided by Westinghouse) and for maintenance services.

To prepare for the renewal of its power generation facilities, EDF has decided to use the EPR technology developed with the Areva group, and has initiated construction of the Flamanville EPR power plant. In connection with this project, in 2007, EDF signed a contract with Areva for the supply of the EPR boiler.

EDF also has a relationship with the Alstom group for the maintenance of certain components of nuclear and fossil fuel-fired power plants. In addition, Alstom is supplying the engine room for the Flamanville 3 EPR. Goods and services that Alstom supplies to EDF are particularly important for the maintenance of the nuclear power plants' turbo-generators and of certain major components of fossil fuel-fired generation facilities. EDF does not consider that it is dependent on the Alstom group, which competes for most of the business given to it. In particular, in 2008 this competition led to Alstom and Toshiba being jointly awarded the major contract for the renovation of the generators of the nuclear power fleet.

1. Not including fuel purchases.





# 5 Information about the issuer

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## 5.1 History and development of the Company

In this reference document, references to the articles of association refer to the Company's articles of association as approved by Decree no. 2004-1224 of 17 November 2004, issued pursuant to Act no. 2004-803 of 9 August 2004 on public electricity and gas service and electricity and gas companies (the "Act of 9 August 2004"), as subsequently amended on several occasions.

### 5.1.1 Company name and registered office

The name of the Company is: "Électricité de France". The Company may also be legally designated by the acronym "EDF".

The Company's registered office is located at 22-30, avenue de Wagram in the 8<sup>th</sup> arrondissement of Paris.

### 5.1.2 Trade and Companies Registry, APE code

The Company is registered with the Paris Trade and Companies Registry under number 552 081 317. Its APE code is 401E.

### 5.1.3 Date of incorporation and term of the Company

EDF was incorporated pursuant to Act no. 46-628 of 8 April 1946 as a French public industrial and commercial establishment. It was converted into a French *société anonyme* (limited company) by the Act of 9 August 2004 and the Decree of 17 November 2004.

The Company was incorporated for a term of 99 years as from 20 November 2004, unless the Company is dissolved before such date or unless its term is extended.

### 5.1.4 Legal form and applicable legislation

Since 20 November 2004, EDF has been a French *société anonyme* with a Board of Directors. It is governed by the laws and regulations applicable to commercial companies, in particular the French Commercial Code, except in the event of specific exceptions stipulated in the French Energy Code, Act no. 83-675 of 26 July 1983 and its articles of association.

### 5.1.5 History

The main stages in the Group's development are described below.

EDF was created in 1946. Before 1946, the electricity sector had developed around numerous local companies across France. At the end of the 1930s, there were approximately 200 generation companies, approximately 100 transmission companies and 1,150 distribution companies.

This multitude of private companies, plus some 250 local utilities, were responsible for about 20,000 distribution concessions. From this highly fragmented segment, a certain number of large groups emerged in the fields of generation and distribution.

In 1946, the electricity and gas sectors were nationalised. The Act of 8 April 1946 created EDF as a French public industrial and commercial establishment and created a special status for the personnel of the electric

and gas industries. The law nevertheless left in existence a certain number of non-nationalised distributors and local distribution companies.

Between 1946 and 2000, the Group's industrial base was developed. Initially, there was a fleet of fossil fuel-fired generation facilities using coal and then fuel oil, as well as hydropower facilities, in particular with the construction of the dams at Tignes in 1952 and Serre-Ponçon in 1960. In 1963, following the French government's decision to guarantee France's energy independence through nuclear power, EDF commissioned the first commercial-scale nuclear generation unit at Chinon (70MW), the first of a series of six generation units of the Uranium Natural Graphite Gas (UNGG) family, the construction of which continued until 1972. The oil crises of 1973 and 1979 led to accelerated replacement of fossil fuel-fired power with nuclear power. In 1969, the UNGG family was abandoned in favour of the Pressurised Water Reactor (PWR) family, which was used for new power plants: 34 generation units totalling 900MW, which were built until 1988; then, 20 generation units totalling 1,300MW, which were built until 1994; then, four N4 generation units totalling 1,450MW, which were commissioned in 2000 and 2002.

Beginning in the 1990s, EDF embarked on significant expansion abroad. In 1992, the Group acquired an interest in Edenor, a distribution and supply company in Argentina. It subsequently raised its stake in Edenor to 90%. In May 1996, EDF acquired a stake in the Brazilian electricity company Light, a distribution and supply company located in the state of Rio de Janeiro. As of 31 December 2004, EDF held 94.8% of the share capital of Light. In December 1998, EDF acquired 100% of London Electricity (which was renamed EDF Energy on 30 June 2003). This policy was pursued in 2000 with the acquisition of 20% of EnBW (a stake that was successively raised to 45.01% by 2005) and the acquisition of equity interests in the Italian company Edison by the IEB consortium (63.8%), in which EDF holds a stake of 18.03%, and in 2002, when London Electricity acquired 100% of the share capital of EPN Distribution Plc. and Seaboard Plc., two distribution companies located in the east and the southeast of England.

In France, the major development in recent years has been the liberalisation of the market pursuant to European regulations. In February 1999, sites where electricity consumption exceeded 100GWh per year, i.e. 20% of the market, became entitled to choose their supplier. The eligibility threshold was then progressively lowered. In May 2000, 30% of the market was thus opened to competition, then 37% in February 2003. In July 2004, all of the market for non-household customers, equivalent to 69% of the entire market, was liberalised. Since July 2007, the market has been liberalised, including for residential customers.

At the same time, the structures necessary for a competitive market to function effectively were set up. The French Electricity Regulation Commission, which became the Energy Regulation Commission (*Commission de Régulation de l'Énergie* or "CRE") was created in May 2000. That same year, in order to guarantee non-discriminatory access to all operators in the market, EDF created Réseau de Transport d'Électricité (which became a wholly-owned subsidiary of EDF in 2005 under the name RTE EDF Transport, and which has been renamed RTE Réseau de Transport d'Électricité), an independent internal entity responsible for managing the high voltage and very high voltage public electricity transmission network. In 2000, the Group formed the trading company, EDF Trading, with the trading specialist Louis Dreyfus. It became a wholly-owned subsidiary of EDF in 2003. In 2001, Euronext and various industrial and financial operators in the electricity market, including EDF, created Powernext, the French electricity exchange. In 2001, as a condition for authorising EDF's acquisition of a stake in EnBW, the European Commission required EDF to set up a system of power supply capacity auctions (Virtual Power Plants or "VPP") to facilitate access to the market for competitors. In 2003, the EDF group sold its stake in Compagnie Nationale du Rhône to Suez (now GDF Suez).

On 20 November 2004, pursuant to the Act of 9 August 2004, EDF became a *société anonyme* with a Board of Directors.

On 12 May 2005, EDF and A2A S.A. (formerly AEM S.p.A) entered into agreements for a joint takeover of Edison. A takeover bid was initiated on 4 October 2005, and the joint takeover was completed on 26 October 2005, the closing date of the bid.

Since 2005, the EDF group has pursued a strategy of refocusing on Europe and sold its controlling interest in its subsidiaries Edenor and Light and its assets in Mexico.

EDF filed for an initial public offering in the second half of 2005. Pursuant to this transaction, the Company offered 196,371,090 newly issued shares and the French government sold over 34.5 million shares it held to employees and former employees of EDF and of certain EDF subsidiaries. Subsequently, on 3 December 2007, the French government sold an additional 45 million of its shares.

In late November 2006, EDF Énergies Nouvelles, a subsidiary in which the EDF group holds a 50% stake, filed for an initial public offering. Pursuant to this transaction, 18,946,854 new EDF Énergies Nouvelles shares were issued, of which 4,798,464 were reserved to the EDF group.

Since 1 January 2008, EDF's distribution business has been conducted by Électricité Réseau Distribution France (ERDF), a wholly-owned subsidiary of EDF to which the distribution business was contributed pursuant to the Act of 7 December 2006 on the energy sector.

Since 2008, the EDF group has become a major player in the revival of nuclear power internationally, by creating a joint venture with the Chinese utility CGNPC, acquiring British Energy, one of the largest energy companies in the United Kingdom, in January 2009, and acquiring nearly half of the nuclear assets of US-based Constellation Energy in November 2009. EDF also acquired a 51% stake in the Belgian power company EDF Luminus in late 2009, and subsequently raised its stake in SPE to 63.5% in June 2010.

On 29 October 2010, EDF finalised the sale of its British distribution networks to the Cheung Kong Group of Hong Kong and, on 17 February 2011, it completed the sale of its 45.01% interest in EnBW to the German state of Baden-Württemberg.

In 2011, after ten years of a strategic partnership in which it held a 50% stake in EDF Énergies Nouvelles, EDF confirmed its positioning as a key player in the field of power generation using renewable energies by increasing its stake in the company to 100% pursuant to a simplified alternative cash or exchange tender offer for EDF Énergies Nouvelles shares, followed by a squeeze-out of minority shareholders.

On 24 May 2012, after more than 7 years of strategic partnership with A2A, EDF acquired Edison, the oldest Italian electricity company and one of the main player in the Italian electricity market, the fourth European market. This operation is part of the implementation of the Group's gas strategy, which will be based on Edison skills throughout the gas chain, from exploration and production of hydrocarbons to the direct marketing of natural gas.

## 5.2 Investments

For a description of the Company's principal investments during 2011-2012, see section 9.4.1.2 ("Net cash flows generated by investments") of this reference document. For a description of the Group's investment policy for future financial years, see section 6.1.4 below ("Investment policy")





# 6 Overview of activities

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The EDF Group is an integrated energy utility active in all areas of the electricity market: nuclear, renewable and fossil fuel energy generation, transmission, distribution and marketing, energy efficiency and management services, as well as energy trading. It is the leading player in the French

electricity market, and holds strong positions in Europe (UK, Italy, Central and Eastern Europe) that make it one of the world's leading electricity utilities and a renowned player in the gas industry.

(in GWe)	Net <sup>(1)</sup> generation capacity		Gross <sup>(2)</sup> generation capacity	
	2012	2011	2012	2011
Nuclear	74.7	74.8	77.5	77.5
Fossil-fuel fired	37.8	34.4	47.7	50.4
Hydropower and other renewables	27.0	25.4	31.1	30.9

(1) Net capacity: energy capacity attributable to the Group pursuant to the basis of the consolidation accounting rules.

(2) Gross capacity: total physical capacity of the unit in which the Group has a stake.

With a net installed capacity of 139.5GWe<sup>1</sup> worldwide at 31 December 2012 (128.5GWe<sup>2</sup> in Europe), and global production of 642.6TWh, the Group ranks among the world's leading energy utilities, with the biggest fleet emitting the least amount of CO<sub>2</sub> per kilowatt-hour generated<sup>3</sup> thanks to the proportion of nuclear, hydropower and other renewable energies in its generation mix.

The EDF Group supplies electricity, gas and related services to more than 39.3 million customer accounts<sup>4</sup> worldwide (nearly 28.6 million in France).

The table below shows the market share of the Group's three main operating segments in 2012 and 2011:

	Electricity (generation)		Gas (sales)	
	2012	2011	2012	2011
France	84%	80% <sup>(1)</sup>	4% <sup>(2)</sup>	4% <sup>(2)</sup>
United Kingdom	N/A <sup>(4)</sup>	20% <sup>(3)</sup>	N/A <sup>(4)</sup>	5% <sup>(3)</sup>
Italy	9% <sup>(5)</sup>	12% <sup>(5)</sup>	21% <sup>(5)</sup>	20% <sup>(5)</sup>

(1) Calculated on the basis of electric power in France, as reported by RTE in 2011 and 2012.

(2) Calculated on the basis of data from the website of the Ministry for Energy (France).

(3) Calculated on the basis of data published by the Department of Energy and Climate Change (UK).

(4) Data not available at the time of filing of this reference document.

(5) Edison data taken from the Edison Annual Report and the Edison website.

## 6.1 Strategy

### 6.1.1 Context

The pressing context of financial and economic crisis is affecting all economic agents in OECD countries, including energy companies. The energy sector must also deal with uncertainty in terms of very volatile prices for gas and oil, as well as CO<sub>2</sub> on the European carbon market. The energy sector is also faced with changes in environmental and regulatory policies in Europe. However, these factors must not overshadow underlying trends and long-term challenges, which remain present and should guide decisions by energy utilities, which must take a long-term view of their action.

The major global changes taking place are characterised by:

- long-term worldwide energy growth (40% in 2035 compared with 2009), particularly in emerging countries with increasing populations, is even more pronounced for electricity (70% in 2035); to date, 1.3 billion people do not have access to electricity, which is a major barrier to progress;
- the increasing cost of access to resources and primary energy;
- the need to comply with environmental policies aimed at "decarbonising" energy production so as to limit the effects of climate change. The electricity sector has a major role to play in meeting this objective;

1. Source: EDF. Figures calculated in accordance with the basis of consolidation.

2. Without EDF Énergies Nouvelles installed capacities in Europe amounting to 2,067MW.

3. Source: PricewaterhouseCoopers, European Carbon Factor, November 2012.

4. Source: EDF. A customer can have two customer accounts: one for electricity and one for gas.

- the rise of a plural and multipolar world: emerging powers (China, Brazil, India, Russia) are signifying the end of the exclusivity of the developed countries on the most advanced technologies;
- a raft of energy solutions meeting the needs of an increasingly urbanised world (50% of the population today lives in an urban setting, the urbanisation rate should reach 70% by 2050): urban systems, local energy, networks and smart meters;
- increased awareness and responsibility for safety in respect of major industrial risks, such as accidents on oil rigs or in nuclear power plants: Fukushima was a watershed moment in 2011, profoundly changing the energy policies of some major economies in the developed world.

The worldwide energy challenge is thus to meet this growth in needs, despite the increasing cost of access to resources and primary energy, coupled with climate constraints. However, it does represent an advantage for electricity, seen as a “vector for energy” when the whole range of primary resources (nuclear, renewable, fossil-fuel) can be used to create an energy mix adapted to each country, to produce affordable energy that respects the environment and the climate.

With this in mind, low CO<sub>2</sub> emission technologies should be given priority upstream, while downstream, demand for energy must be managed via more efficient usage.

## 6.1.2 Strategic vision

When facing all these developments and the geopolitical change currently in progress, EDF – already the world’s leading electricity producer – is aiming to set global standards as the leading electricity company, which involves:

- in every country where it conducts business, seeking the best production mix, adapted to technical, economic, and environmental conditions, in close partnership with the various public authorities concerned and all stakeholders;
- thanks to its industrial mastery of the entire electrical chain (generation, grids, etc.), ensuring quality of service in terms of the volumes delivered to customers. Specifically, being the leader in terms of nuclear safety, so as to pass on the benefits to all its existing and future facilities in France, Europe and internationally;
- extending and increasing high-performance uses of electricity. Energy efficiency requirements (demand management), smart grids and electrical mobility are all ideas that contribute to the concept of the “sustainable city”;
- adopting a worldwide scope, so as to seek growth where it can be found, by diversifying generation types and countries. This uses the benefit of feedback from areas in which EDF is already established, and implementation of the best available technologies in all the countries in question;
- innovating on all the links of the integrated chain of generation, transmission, distribution, marketing, services and trading, to pave the way for tomorrow’s solutions.

For an energy as vital as electricity, all these missions represent a public service process, the Group’s heritage and a sustainable asset for the future, adapted to each local situation.

## 6.1.3 Strategic areas to 2020

### 6.1.3.1 Strengthening the Group’s competitive advantage on its existing bases

#### EDF’s industrial expertise: at the core of EDF’s business

The Group has recognised industrial expertise in terms of generation, transmission, distribution, and downstream processes (marketing, efficiency

and energy management services) as an integrated player in the design, building and operation of resources, with an exemplary record in terms of the safety of its industrial facilities, its performance and customer satisfaction.

Specifically, in terms of generation, the Group intends to roll out its capabilities across all subsidiaries: from nuclear energy to major hydropower facilities, not forgetting other renewable energies, gas-fired and clean coal-fired thermal power plants.

Safe nuclear energy relies on the responsibility of an operator that, like EDF, integrates its run, build and design skills within a framework of continuous improvement, and on a safety authority that is independent and competent.

In connection with the Fukushima accident and the stress tests undertaken on a European level, EDF is set to strengthen the protection of its nuclear power plants to face flooding/earthquakes, and to set up a rapid response task force to combat extreme events (e.g. the loss of electricity supplies and cold sources) (see section 6.2.1.1.3.5 (“Preparing the future of the nuclear power fleet in France”)).

At a time when many countries use nuclear energy to meet their energy requirements in an affordable, decarbonised way, it is important to implement international discipline to move towards nuclear energy that is even safer and more demanding under the guidance of the International Atomic Energy Agency (“IAEA”) and the World Association of Nuclear Operators (“WANO”).

EDF is a worldwide reference, able to offer its skill bases and support those operators or countries that wish to use and develop safer nuclear energy.

#### France: the cornerstone of the Group’s industrial legitimacy throughout the world

In France, EDF will continue with its actions implemented since 2010. The Group has set three priorities for its domestic market:

- operating performance relating to the generation fleet (including feedback and lessons learned from Fukushima), grids and support provided to its customers;
- strengthening of industrial facilities via investment, specifically the Flamanville EPR, offshore wind farms and new combined-cycle gas plants;
- skills renewal, thanks to the Group’s ability to provide employees with opportunities to develop their mobility and to attract new talent.

#### United Kingdom: strengthening our position

EDF’s ambition is to deepen its roots in the United Kingdom, preparing for a significant stage in the renewal of its generation fleet. Policy decisions in support of low-carbon energy, as well as ongoing exchanges with the British government on the conditions governing its profitability enable the Group to work on its nuclear development projects. At the same time, the Group intends to extend the lifespan of its existing fleet, under the highest safety conditions.

#### Italy: a platform for the Group’s expansion

The takeover of Edison on 24 May 2012 (see section 6.3.2.1 (“EDF Group’s strategy in Italy”)) allowed the EDF Group to diversify its generation mix, to strengthen its position, with full control of Edison, in Italy, one of the key energy markets in Europe, benefiting from a significant geostrategic position in terms of gas supply.

As regards gas, EDF can count on the skills of Edison (specifically for Exploration & Production) and its complementary positions to those taken by the Group in terms of gas infrastructure (specifically the Rovigo LNG terminal). In electricity, Edison will become a platform for the Group’s growth in all countries around the Mediterranean basin, particularly in terms of thermal and hydropower generation.



### Poland: growth prospects

The Group aims to develop in this country that is enjoying growth perspectives, both for the economy and in power consumption. The Group operates in three of its business lines in Poland, namely thermal and renewable generation, energy services and marketing, and continues to work to realise operational synergies.

### Other European countries

Already present in Benelux and Central Europe, the Group wants to encourage the creation of operational synergies and to develop its activities in European countries where growth in electricity demand is significant.

### 6.1.3.2 Entering key countries

EDF has identified four key countries for its international expansion: Russia, Turkey, Brazil and China. All four countries are enjoying high growth, with electricity needs expanding rapidly, and are either strategic to the Group, or key to the development of certain Group businesses: nuclear power in China, hydropower in Brazil, gas supplies to Europe for Russia.

### 6.1.3.3 Responding to the diversity of its customers throughout the world

EDF aims to strengthen its international presence and use the diversity of its expertise. Aside from the four key countries mentioned above, EDF's objective is to develop value-creating projects, often in partnership with local players.

In terms of generation, the Group aims to have a net installed capacity by 2020 maintaining its position among the world's leaders and made up of 50% nuclear, 25% coal- or gas-fired, and 25% hydropower and other renewable energies (wind power, biomass, solar power, etc.):

- nuclear power, which provides competitive electricity without emitting CO<sub>2</sub>, is fully entitled to be part of the worldwide energy mix. Countries such as Russia, Brazil, India, the United States, China, South Africa and several countries within the European Union, such as the United Kingdom, Poland, Finland and the Czech Republic, have confirmed that nuclear power will play a significant role in their electricity generation;
- in fossil-fuel fired power plants, EDF aims to provide its knowledge of the most modern and environmentally friendly technologies, along with its project management expertise;
- as regards hydropower, the Nam-Theun II experiment in Laos showcases EDF's ability. Other Asian countries, along with those in South America, are interested;
- for the other renewable energy sources, the full takeover of EDF Énergies Nouvelles in 2011 was entirely consistent with this goal.

Furthermore, the Group aims to showcase its experience in the planning, design or operation of grids with countries that wish to strengthen or modernise their infrastructure and move towards smarter grids. Partnerships between ERDF and Chinese and Russian grid operators are the first examples of this.

In the downstream segment, which comprises optimisation, trading and marketing of offers adapted to customers, EDF intends to develop the value of the customer portfolio and widen the scope of its skills outside France. EDF is committed to cementing customer loyalty thanks to the excellence of its customer relationship and its support for their actions and investments in energy efficiency. EDF also provides specific treatment for customers facing energy insecurity.

Lastly, gas for EDF is also a structural element in its electricity operator business, specifically enabling the supply of the Group's combined-cycle

gas turbines, or the extension of offers to end-customers. Investment projects in the Dunkirk LNG terminal, decided in May 2011, and in new gas storage facilities, participation in the South Stream international gas pipeline project, and the complete takeover of Edison are at the core of this process (see sections 6.4.2.2.2 ("Infrastructures"), 6.3.3.1.2 ("Russia") and 6.3.2 ("Italy")).

Selectivity and pragmatism (expectations of countries, knowledge of players and partnerships, and opportunities) will be key factors in terms of the strategic choices to be made.

EDF aims to provide sustainable industrial solutions via varied contractual methods: contracting assistance, third-party management or IPP (Independent Power Producer) investments. Rights of control in the shareholders' agreements will enable the Group to take full responsibility for its industrial and technological choices.

### 6.1.3.4 Controlling the future by combining the unique expertise of EDF and anticipating long-term needs

EDF wants to strengthen its innovation and R&D efforts so as to pave the way for the future in a context where the world is facing major challenges linked to global warming, supply security and the continuously increasing demand for electricity worldwide. 2,000 engineers and technicians are thus working towards the development of the Group's ability to anticipate future needs in all its business lines: the safety and performance of production tools and grids, alongside efficient usage (see section 11.2 ("R&D Priorities")).

The Group will specifically emphasise:

- low CO<sub>2</sub> emission generation activities. For instance, in addition to nuclear and hydropower, technologies such as new-generation photovoltaics, concentrated solar power, offshore wind farming, and tidal turbine farming represent potential in the future;
- CO<sub>2</sub> capture and storage, an essential challenge for the sustainable use of coal (as a fuel) throughout the world;
- investment linked to the lifespan of materials, specifically the replacement of some major equipment items with a view to improving both operational performance and safety levels. An important theme in R&D is the study of how materials age, a key parameter in calculating the operational lifespan of power plants.

EDF will also focus its R&D efforts on sales and grids, and on monitoring significant changes. The development of smart electrical systems, such as the Linky communicative meter, tested by ERDF in Lyon and Tours, and the services EDF can offer its customers downstream of the meter (such as improvements in managing consumption) are an important part of this strategy. Research undertaken by EDF will also focus on the development of reasonably priced low-energy buildings, smart buildings, and innovative uses of electricity, for transmission, comfort or industry. Thanks to the opportunities uncovered by smart electrical systems, EDF will be able to effectively position electricity in the transition to a low carbon society, specifically built around sustainable cities.

The quality and motivation of EDF's teams, their skills, their corporate involvement and their public service mission are also an essential asset for the future of the Company. Because the Group will have to deal with a substantial wave of retirements in the coming years, maintaining the wealth of this human capital within the Company is a subject that is continuously addressed.

Attracting new talent and further increasing training efforts will be central to the Group's concerns in order to succeed in the mission it has set itself (see section 17.1.2 ("Training and mobility policy")).

## 6.1.4 Investment policy

### 6.1.4.1 Investments in 2012

The Group continued its programme of gross operational investments, in the amount of €13.4 billion in 2012, compared with €11.1 billion in 2011. Capital expenditure focused on both the regulated (26%) and deregulated (74%) segments. In the deregulated segment, investment is split almost evenly between investments to develop new capabilities (new nuclear power plants, combined-cycle gas turbines) in the amount of €5.5 billion (41% of the total) and maintenance investment of €4.4 billion (33% of the total), of which nearly €3.1 billion dedicated to nuclear power plant maintenance. In France, operating investments rose by 11.6% to €8.2 billion. Substantial operational investments were made in the United Kingdom, in the amount of nearly €1.6 billion, on renewable energies and the development of new nuclear power plants. In the rest of the world, operational investments totalled nearly €1.0 billion, and €2.6 billion in other business (EDF Énergies Nouvelles, EDF Trading and Dalkia).

In 2012, EDF also made external growth investments mainly the acquisition of Edison, followed by a mandatory squeeze-out of non-controlling shareholders, and the acquisitions of Enerest and Photowatt in France and the acquisition of non-controlling interests in subsidiaries in Poland.

### 6.1.4.2 Investments in 2013

In 2013, the Group's net operational investments except Linky and strategic operations should be fairly close to the €12 billion spent in 2012.

### 6.1.4.3 Investments to 2015

In the years to 2015, the Group aims to develop its business model to increase its profitability. To do so, the Group strengthened its requirements in terms of investments profitability.

The Group will consistently increase its investments in the nuclear fleet by 2015, with a view to reinforcing safety and allowing efficient operation of the fleet, by increasing output.

Maintenance will be given priority, with an increase of the major component replacement programme (€3.4 to €3.6 billion by 2015) aimed at extending the operational lifespan of power plants to more than 40 years in the best possible conditions of safety and operation. For instance, this was reflected in 2011 in the signing of agreements to overhaul safety control monitoring systems for 1,300MW reactors and the ordering of 44 steam generators. Lastly, the Group will capitalise on the lessons learned from the Fukushima accident, and plans to invest an overall amount of approximately €10 billion, in line with the recommendations of the ASN (French Nuclear Safety Authority).

Investment growth will also involve the development of the nuclear fleet. In this area, the Group plans to use the EPR technology acquired from the joint experience of operating French and German nuclear plants – whose safety standards have been reviewed by German and French and since 2012 British regulators (see section 6.2.1.1.3.5 ("Preparing for the future of the nuclear fleet in France")).

The EPR is a reactor that can achieve power of approximately 1,600MW. Its development, which dates back to the early 1990s, has been carried out by AREVA NP in partnership with EDF and German electricity companies, who helped fund its development and contributed the technical expertise acquired through the operation of their nuclear fleets. Like other reactors in use in France, it is a pressurised water reactor. It also benefits from the technological and operational advances of the latest French and German reactors.

The EPR industrial project accordingly meets high standards in terms of safety, environmental protection, technical performance and operation.

The development of the new EPR reactor model is as such an opportunity for EDF to reinforce the safety of its nuclear fleet by further reducing the likelihood of a serious accident and further limiting any potential consequences. These safety goals were adopted since the reactor's design phase.

The EPR project is also part of EDF's commitment to environmental protection by significantly improving its performance in comparison with the current fleet.

With regard to current units, the EPR project's principal objectives are to reduce the volume of radioactive waste and emissions; in the area of radiation protection, to halve the collective annual dose compared with the current average level for units in operation in France; to achieve an availability of 91% through design principles from German reactors, which allow generation during maintenance operations; and to achieve, from the design stage, a technical operating life of 60 years.

The development of EPR projects (Flamanville 3 in France and Taishan 1 and 2 in China) will enable EDF to prepare industrially for the construction of new reactors in France and internationally, in line with its strategy of growing in nuclear power:

- by managing a reactor model that has been technically proven and that complies with the requirements of the ASN;
- by developing an operational industrial organisation for the construction of initial models;
- by acquiring, through these projects, experience building EPR plants and capitalising on the lessons learned before launching new projects. EDF and AREVA accordingly signed a technical and commercial agreement in 2011, bearing notably on further optimisation of the EPR, based on feedback from the work in progress.

In addition to the EPR programme currently in progress, the Group has projects in the United Kingdom and in the longer term in Poland. The EPR is now the Group's flagship programme in the field of nuclear development.

However, it is essential to strengthen the offer of nuclear reactors, in accordance with the guidelines of the French Nuclear Policy Council on 21 February 2011, confirmed by the Nuclear Policy Council on 28 September 2012. On 19 October 2012, EDF, AREVA and CGNPC signed a cooperation agreement with a view to considering the development of a new third generation reactor of intermediate size (1,000-1,100MW).

In collaboration with AREVA, EDF is also working to optimise the design of the EPR, going beyond consideration of experience gained from EPR units currently being built.

EDF is pursuing the objective of expanding and modifying its range of offerings in respect of reactors and services in international markets.

At the same time, the EDF Group will invest to diversify its energy mix, while pursuing the goal of ensuring that 75% of its power generation fleet is free of CO<sub>2</sub> emissions.

As such, several long-term investments have already been approved. In France, the coal-fired power plant in Bouchain will be converted into a 510MW gas-fired power plant based on the turbine co-developed with GE Energy. EDF also decided in June 2011 to launch the Dunkirk LNG terminal, which is due to be commissioned in the second half-year 2015, for a Group share of €650 million.

## 6.2 Presentation of EDF group's business in France

### 6.2.1 Deregulated activities in France

EDF's deregulated activities in France (activities open to competition), include electricity generation and the sale of electricity and natural gas. EDF is implementing an integrated model for the joint operational management of its portfolio of assets upstream (generation and procurement of energy and fuels) and downstream (wholesale and retail) to guarantee supply of its customers through the best possible management of operational market risks and with a view to maximising gross margin.

#### 6.2.1.1 Electricity Generation

EDF groups together its main electricity generation activities in France within its Generation and Engineering Division, which has all of the skills and performance levers necessary to operate the largest European electricity generation fleet and to manage its development and continuity.

As at 31 December 2012, the Generation and Engineering Division had 38,417 employees<sup>1</sup>. It is organised around three major businesses: nuclear, hydropower and fossil fuel thermal power. In addition, through its engineering, it provides technical and industrial skills to the entire Group in these three fields (see section 6.3 ("Presentation of EDF Group's international business")).

##### 6.2.1.1.1 General presentation of EDF's generation fleet

##### 6.2.1.1.1.1 Composition and specifications of the installed fleet

With a total installed generation capacity of 97.9GW in continental France<sup>2</sup>, as at 31 December 2012, EDF has the largest generation fleet in Europe,

accounting for just over 10% of the total installed capacity of the main countries of Europe (the 35 countries having members of ENTSO-E, the European Network Transmission System Operators for Electricity - which includes Germany, Italy and Spain<sup>3</sup>).

In 2012, EDF's generation fleet represented 454.4TWh excluding pumped storage hydropower and 461.1TWh including pumped storage hydropower.

As at 31 December 2012, the capacity of EDF's generation fleet in mainland France was as follows:

- 58 nuclear units based on pressurised water reactors (PWR) (a unit is defined as a generation unit including a reactor, steam generators, a turbine, a generator, the related equipment and the buildings that house them). These units have electrical power capacities varying from 900MW to 1,450MW and are spread out over 19 sites, with an average age of 27 years;
- 36 functioning fossil-fuel thermal units, with those in service having an average age of approximately 28 years; in addition, seven units under guaranteed multi-year shutdown<sup>4</sup>;
- 435 hydropower plants with an average age of 68 years<sup>5</sup>.

There were also:

- the wind power generation capacities of EDF Énergies Nouvelles in France (see section 6.4.1.2.2 ("EDF Énergies Nouvelles")) and the incineration plants of the Tiru group (see section 6.4.1.5 ("Tiru"));
- 84 hydropower plants falling within the scope of operation of the Generation and Engineering Division, though held by Group subsidiaries: SHEMA (100%), FHVM (69.5%), CERGA (50/50 owned with the German electricity company EnBW). These plants represent a total of around 121MW of installed capacity in 2012 and around 575GWh of energy production<sup>6</sup>.

##### 6.2.1.1.1.2 Evolution of the installed capacity and generation over the last three years

The table below shows the evolution of the fleet's installed capacity in mainland France over the last three years:

	31/12/2010		31/12/2011		31/12/2012	
Installed capacity <sup>(1)</sup>	MW	%	MW	%	MW	%
Nuclear	63,130	65	63,130	65	63,130	65
Hydropower <sup>(2)</sup>	20,022	21	20,007	20	20,010	20
Thermal <sup>(3)</sup>	14,012	14	14,275	15	14,734	15
<b>TOTAL</b>	<b>97,176<sup>(4)</sup></b>	<b>100</b>	<b>97,424<sup>(4)</sup></b>	<b>100</b>	<b>97,874<sup>(4)</sup></b>	<b>100</b>

(1) Expressed in MW of maximum capacity attached to the network.

(2) Excluding Corsica and the French Overseas departments, 400MW in 2012.

(3) Excluding Corsica and the French Overseas departments, 1,488MW in 2012, including 2,325MW for units under guaranteed multi-year shutdown.

(4) This figure also includes 12MW of wind generation capacity.

1. An increase of 1,848 employees from 2011.

2. For Corsica and the French overseas departments, see section 6.2.2.3 ("Island Energy Systems").

3. Calculation based on the ENTSO-E statistics for 2012, as statistics for the year are not available until 30 April of the following year.

4. The generation facilities under "guaranteed multi-year shutdown" are awaiting a decision of reactivation or operational withdrawal.

5. Arithmetic mean.

6. Output potential and capacity are indicated in proportion to investment.

The table below shows the change in the EDF's installed capacity in mainland France over the last three years:

Generation	31/12/2010		31/12/2011		31/12/2012	
	TWh	%	TWh	%	TWh	%
Nuclear	407.9	88.0	421.1	91.6	404.9	89.1
Hydropower <sup>(1) (2)</sup>	38.8	8.4	26.8	5.8	34.5	7.6
Thermal <sup>(3)</sup>	16.9	3.6	11.8	2.6	14.9	3.3
<b>TOTAL <sup>(4)</sup></b>	<b>463.6</b>	<b>100</b>	<b>459.7</b>	<b>100</b>	<b>454.3</b>	<b>100</b>

(1) Excluding Corsica and the French Overseas departments, 1.3TWh in 2012.

(2) Net pumped storage power generation: the electricity consumption needed for the operation of pumped storage power plants (STEP) amounted to 6.7TWh in 2012, resulting in hydropower generation (including pumped storage consumption) of 41.2TWh, and including generation from tidal power plant on the Rance river (503MW).

(3) Excluding Corsica and the French Overseas departments, 4.1 TWh in 2012.

(4) These values correspond to the sum of the specific values, corrected to one decimal place.

#### 6.2.1.1.2 Strengths of the generation fleet

With a total installed capacity of 97.9GW as at 31 December 2012, in mainland France EDF has the largest fleet of generation facilities in Europe.

This fleet has significant assets:

- a competitive generation mix with low variable generation costs <sup>1</sup> and limited exposure to hydrocarbon and carbon market fluctuations due to nuclear and hydropower facilities;
- a variety of means of generation, which enables adequate coverage of EDF's downstream portfolio needs (end users, sales to alternative suppliers, sales on the wholesale markets, etc.). Use of the fleet's various components is managed by giving priority, at any given time, to the generation type offering the lowest variable costs. Run-of-river hydropower plants are used for base generation. Nuclear plants, because of their low variable generation costs, are used for baseload and mid-merit generation. Adjustable hydropower generation (coming from dams) and fossil-fired plants are used for mid-merit and peak generation;
- a significant standardised fleet of nuclear facilities, for which EDF provides full control over their entire life cycle. Moreover, EDF is working towards extending the operating life of its power plants and improving their technical performances;
- a fleet generating at over 95% without CO<sub>2</sub> emissions due to the predominance of nuclear and hydropower generation facilities, in an increasingly restrictive environmental regulatory context; and

- a geographical position at the junction of electricity exchanges between the continental platform and the electric peninsulas (Italy, Spain and the United Kingdom).

#### 6.2.1.1.3 Nuclear generation

The electricity generated by EDF from its fleet of nuclear power plants represents, as at 31 December 2012, 89.1% of its total electricity generation excluding pumped storage hydropower.

The specifications of this fleet are given below.

##### 6.2.1.1.3.1 EDF's nuclear fleet

EDF's PWR model is divided into three series of available electrical power:

- a 900MW series consisting of 34 units of approximately 900MW (for a total power capacity of 30,770MW) with an average age of 31 years;
- a 1,300MW series consisting of 20 units of approximately 1,300MW (for a total power capacity of 26,370MW) with an average age of 24 years;
- the N4 series, which is the most recent with an average age of 12 years, consisting of four units of approximately 1,450MW (for a total power capacity of 5,990MW);

for a total of 58 units in operation with an average age of 27 years, spread over 19 sites owned by EDF, and constituting a total installed capacity of 63,130MW as at 31 December 2012.

1. Variable generation costs correspond to all costs that vary directly with the level of energy generated. For electricity generation, variable costs are essentially made up of fuel.

# 6 | Overview of activities

## Presentation of EDF group's business in France

The commissioning and ten-year inspection dates for these units are as follows as of end 2012:

Units	Year of industrial commissioning	End of most recent ten-year inspection	Next ten-year inspection	Units	Year of industrial commissioning	End of most recent ten-year inspection	Next ten-year inspection
Fessenheim 1	1978	2010	VD4	Gravelines 6	1985	2007	VD3
Fessenheim 2	1978	2012	VD4*	Cruas 3	1985	2004	VD3
Bugey 2	1979	2010	VD4	Cruas 4	1985	2007	VD3
Bugey 3	1979	2002	VD3	Chinon B3	1987	2010	VD3
Bugey 4	1979	2011	VD4*	Chinon B4	1988	2010	VD3
Bugey 5	1980	2011	VD4*	Paluel 1	1985	2006	VD3
Dampierre 1	1980	2011	VD4*	Paluel 2	1985	2005	VD3
Gravelines 1	1980	2012	VD4*	Paluel 3	1986	2007	VD3
Gravelines 2	1980	2002	VD3	Paluel 4	1986	2008	VD3
Tricastin 1	1980	2009	VD4	Saint-Alban 1	1986	2008	VD3
Tricastin 2	1980	2011	VD4*	Flamanville 1	1986	2008	VD3
Dampierre 2	1981	2012	VD4*	Saint-Alban 2	1987	2008	VD3
Dampierre 3	1981	2003	VD3	Flamanville 2	1987	2008	VD3
Dampierre 4	1981	2004	VD3	Cattenom 1	1987	2006	VD3
Tricastin 3	1981	2012	VD4*	Cattenom 2	1988	2008	VD3
Tricastin 4	1981	2004	VD3	Nogent 1	1988	2009	VD3
Gravelines 3	1981	2012	VD4*	Belleville 1	1988	2010	VD3
Gravelines 4	1981	2003	VD3	Belleville 2	1989	2009	VD3
Blayais 1	1981	2012	VD4*	Nogent 2	1989	2010	VD3
Blayais 2	1983	2003	VD3	Penly 1	1990	2011	VD3*
Blayais 3	1983	2004	VD3	Cattenom 3	1991	2011	VD3*
Blayais 4	1983	2005	VD3	Golfech 1	1991	2012	VD3*
Saint-Laurent 1	1983	2005	VD3	Cattenom 4	1992	2003	VD2
Saint-Laurent 2	1983	2004	VD3	Penly 2	1992	2004	VD2
Chinon B1	1984	2003	VD3	Golfech 2	1994	2004	VD2
Cruas 1	1984	2005	VD3	Chooz B1	2000	2010	VD2
Chinon B2	1984	2006	VD3	Chooz B2	2000	2009	VD2
Cruas 2	1984	2007	VD3	Civaux 1	2002	2011	VD2*
Gravelines 5	1985	2006	VD3	Civaux 2	2002	2012	VD2*

\* Subject to operating approval from the ASN. The operating permit for the next ten years is given by the ASN during the generation cycle following each ten-year inspection after appraisal by the safety review issued by the operator six months after the end of the ten-year inspection.

The first unit of the 900MW series was commissioned for industrial use in Fessenheim in 1978. The most recent unit was commissioned for industrial use in Civaux in 2002. With an average age of approximately 27 years for an estimated technical operating life of over 40 years (benchmark for accounting purposes and the initial nuclear unit design), the EDF's nuclear fleet is in the mean of the fleets installed worldwide.

First-generation design EDF plants have been gradually shut down and are currently being decommissioned (see section 6.2.1.1.3.6 ("Decommissioning of nuclear power plants")).

### Generation allocation contracts

EDF has developed industrial cooperation with European operators in the nuclear industry in the form of generation allocation contracts related to units of EDF's French nuclear fleet.

After Enel's decision in December 2012 to cancel the cooperation agreements signed with EDF in 2007 (see section 6.2.1.1.3.5 ("Preparing for the future of the nuclear fleet in France")), EDF's fleet includes 10 generation units (up to 1.4GW) with the following European electricity companies:

- Fessenheim 1-2: EnBW (17.5%) and the Swiss electricity group CNP (15%);
- Cattenom 1-2: EnBW (5%);
- Bugey 2-3: Électricité de Laufenbourg<sup>1</sup> (17.5%);
- Tricastin 1 to 4: Electrabel<sup>2</sup> (12.5%).

The purpose of these generation allocation contracts, for each unit concerned, is to make available to each partner the proportion of energy generated actually due to them in return for payment of their share of the construction costs, annual operating costs (including upstream and

1. Axpo group.

2. GDF Suez.



downstream fuel costs), local taxes and taxes specific to nuclear energy, and the costs relating to decommissioning. In these operations, the partners shared the industrial risks with EDF during the development of the power plants (involving three initial series units) and assume the performance risks associated with the current operation of the power plants. They have, however, no operational role.

Furthermore, EDF signed a second type of generation allocation contract (totalling a little over 2GW) that enables its partners to receive a share of the electricity generation from a given power plant fleet based on the average actual performance of that fleet.

These contracts mainly concern the following power plants:

- Chooz B1-B2 (initial series unit N4): Electrabel (21.67%) and the Belgian company EDF Luminus (3.3%);
- Cattenom 3-4: Électricité de Laufenbourg (7.8%) and the consortium of Swiss electricity companies CNP (21.8%).

#### 6.2.1.1.3.2 Operation and performance of the nuclear fleet

Nuclear power is a means of generation whose variable cost, which is mainly made up of the fuel costs, is low since it represents less than 30% of operating costs<sup>1</sup>. Therefore, the main competitive levers of the nuclear fleet are the amount of generated energy and the optimisation of fixed operating and maintenance costs. The levers relating to the fuel cycle are further discussed in section 6.2.1.1.3.4 ("The nuclear fuel cycle and related issues"). Based on a constant scope in terms of capacity and in compliance with the energy mix selected, EDF aims to increase its nuclear energy generation.

#### Operation methods of the nuclear fleet

##### Generation cycle and scheduled shutdowns

In order to reconcile the issues concerning the strong variations in seasonal consumption in France, the availability of maintenance resources, and the efficient use of reactor fuel, EDF has now adopted normative operating cycles of 12 and 18 months for its fleet. At the end of 2012, they were distributed as follows:

- 28 units of the 900MW series have an operating cycle of about 12 months;
- Six units of the 900MW series, 20 units of the 1,300MW series, and since 2010, four units of the N4 series (1,450MW) have an operating cycle of about 18 months.

After each 12- and 18-month operating cycle, shutdown periods are programmed in order to replace a fraction of the fuel loaded in the reactor's core and to perform scheduled maintenance.

Two types of programmed shutdowns are alternated at the end of each generation cycle:

- an ordinary shutdown for refuelling only (*Arrêt pour Simple Rechargement*, or "ASR"), during which unloading spent fuel and refuelling fresh fuel is the main operation performed, although light maintenance or periodic testing may also take place during this type of shutdown, for which the standard period is around 35 days; and
- a partial inspection ("PI") for refuelling and maintenance, for which the standard period is around 60 days.

Every ten years, the power plant is shut down for a standard period of around 100 days in order to perform a ten-year inspection.

This length varies according to the works and maintenance programme and the series in question.

The programme for a ten-year inspection comprises:

- the unloading of spent fuel and loading of fresh fuel, as is the case at each shutdown;
- hydropower tests of the primary and secondary circuits, a liner test, and inspection works on the reactor vessel;
- adjustment work, associated with ten-year safety reassessments;
- other specific maintenance operations including major component renovation.

At the end of each ten-year inspection, the ASN decides whether or not to authorise the restarting of the reactor and it issues an opinion and technical prescriptions which are key for continued operation for another ten-year period.

#### Operation of EDF's nuclear fleet

Owing to their low variable cost, nuclear generation means are first and foremost used as base-load generation means, after the run-of-river hydropower, the other renewable energies and the energy bought under the purchase obligations from the decentralised electricity producers. The variations in consumption of EDF's final customers during one year (summer-winter, day-night) and the current restrictions in fluidity of the wholesale markets due to limited interconnections, lead to nuclear power also being used for mid-merit generation. High variations in seasonal consumption in France and variations in levels of consumption during the winter months (a drop in temperature of 1°C in winter entails a rise in electricity consumption in France which can reach 2,300MW<sup>2</sup>) require that nuclear fleet shutdowns be concentrated between April and October. The 2003 heat wave highlighted the consequences of very high temperature increases in rivers, in particular regarding the operating conditions of "riverside" units. The frequency of unit shutdowns was thus reviewed to reduce the number of shutdowns in "seaside" units during July and August and thus to encourage these units to continue to operate at maximum generation, since their cooling capabilities are less linked to climatic conditions.

#### Generation and technical performance

The nuclear fleet's generation amounted to 404.9TWh in 2012, a volume down 16.2TWh or -3.8% compared with 2011.

Nuclear generation expressed in annual energy corresponds to a load factor, "Kp" for the French nuclear fleet (defined as the generated energy as a percentage of the theoretical maximum energy, or the energy generated if the installed capacity were operated year-round).

This factor is obtained by multiplying two coefficients ( $Kp = Kd \times Ku$ ):

- the availability factor, "Kd" (the available energy<sup>3</sup> as a percent of the theoretical maximum energy, or the energy generated if the installed capacity were operated year-round);
- a utilisation factor, "Ku" (energy generated compared to energy available). Ku reflects environmental and social constraints, supply of system services, and optimisation implemented by EDF (fuel and modulation).

In 2012, the Kp was, at 73%, lower than in 2011 (76.1%). This is the consequence of a Kd of 79.7%, down one point compared with 2011, and a Ku of 91.6%, down 2.7 points compared with 2011.

1. Operating costs are cash costs and are defined as follows: fuel costs (including downstream expenses in the fuel cycle), operating expenses (purchases and external services, employee expenses) and maintenance costs (expenses and investments). They do not include investments related to construction, decommissioning expenses, or depreciation/amortisation and provisions.

2. Source: RTE.

3. The available energy is equal to the maximum theoretical energy less losses for technical reasons inherent to power plants, such as planned shutdowns, unplanned outages due to failure or safety requirements, and regulatory tests.

Compared with 2011, the change in output of slightly over 16TWh is mainly due to an increased volume of extended outages resulting of:

- technical incidents and quality defaults in a number of operations performed during shutdowns, mainly in the second half of 2012;
- additional work and inspection during shutdowns, in particular on the units of the N4 series at Chooz and Civaux.

At the same time, 2012 was characterised by:

- the continued reduction of exceptional outages, thanks to the completion of the steam generator leaching programme in 2011, and progress on the renovation programme on the main transformers and alternators;
- maintaining performance in terms of unexpected shortages (2.8% in 2012).

Thanks to a proactive maintenance strategy implemented since 2007 in terms of renovation and major component replacement, as well as to improving work organisation and methods, the Group believes that during periods of standard operation (as experienced in the past), a Kd close to 85% is achievable.

However, as the fleet has entered a significant overhaul programme ("*grand carénage*") scheduled over the next ten years, with a substantial volume of works resulting in extended production stoppages, the challenge in the coming years will be to industrially control the programme and its impact on the duration of stoppages. Furthermore, in view of the strong seasonality of the electricity demand in France (see section "Operation of EDF's nuclear fleet") and the state of the development of REN (renewable energy) generation facilities, the issues have shifted. Today, EDF's foremost objective is to have a maximum generating capacity in winter, including sustained availability of the nuclear fleet greater than 90% during this important period of the year.

## Implementation on the operational fleet of the EDF industrial nuclear power project

In order to further increase the level of safety and prepare for the extension to the fleet's operating period (see 6.2.1.1.3.5 ("Preparing for the future of the nuclear fleet in France")), EDF will carry out a substantial volume of works in the coming years on each of its 58 units. This is the aim of the "*Grand Carénage*" or large-scale streamlining programme, which is scheduled for the operational fleet project.

Accordingly, by 2015, EDF aims to perpetuate its technical and industrial asset base, via technical, organisational and human resource actions.

The renovation or replacement programmes for large power plant components such as alternators, transformers and steam generators are set to continue. By the end of 2012:

- alternator stators were renovated on 31 units, out of a total of 50 units showing insulation risks;
- preventative replacement of the "shielded" poles of the main transformers is ongoing. At the end of 2012, 18 poles (equivalent to six units with 3 poles per unit) were entirely renovated. This programme, which has been industrialised since 2012 with the ongoing goal of replacing poles in an average of four units per year, made possible the renovation of the remaining N4 series and made the units of the 1,300MW series secure by the end of 2012;
- between 1990 and the end of 2012<sup>1</sup>, steam generators were replaced in 23 units.

The third series of ten-year inspections of the 900MW series are an opportunity to commit to large component renewal.

Regarding the organisational aspects of routine maintenance, EDF continues to deploy the AP 913<sup>2</sup> procedure to improve reliability and develop equipment health checks that aim to reduce unplanned outage rates.

Strengthening the operational management of power generation and of planned outages also continues through the systematic implementation, for each outage, of an Operational Centre for Continuous Management of Units Outages (COPAT) and rolling out a new information system (SDIN). The ultimate goal is to reduce the average time for outage extension periods via continuous management of the critical activities of the outage and a reactive response to technical alerts.

Moreover, following the increase in outage extension observed in 2012, the plan to control the duration of outages will be reinforced with a focus mainly on a stabilization of preventative maintenance during outages, the improvement in quality of preparation and execution of maintenance and the reinforcement of control of restart operations.

The industrial project for the nuclear fleet will continue beyond 2015 on the occasion of the third series of ten-year inspections of 1,300MW units and fourth series of ten-year inspections of 900MW units. This project will be an opportunity to implement safety improvements and to incorporate feedback from the Fukushima accident and the changes related to the goal of extending the operation of the facilities to 60 years (see section 6.2.1.1.3.5 ("Preparing for the future of the nuclear fleet in France")).

## 6.2.1.1.3.3 Environment, safety and radiation protection

### Environmental protection

EDF bases its environmental procedure on an ISO 14001-certified management system (see section 6.6.2.1 ("organisation and ISO 14001 certification")). Started in 2002 over a number of sites, ISO 14001 certification was widened to include all nuclear production units in 2004. After the renewals of 2005 and 2008, ISO 14001 certification was once again renewed in 2011 for all nuclear production units.

In this respect, EDF is making great efforts to reduce the incidence of liquid and gas emissions into the environment by its nuclear power plants. From 1990 to 2002, while already reaching levels much lower than the regulatory limits, EDF reduced its radioactive liquid emissions by a factor of 30 (excluding tritium and carbon-14). Since then, liquid emissions have again been halved, and now stand at a very low level.

In terms of the radioactive waste management plan, very low-level waste has been removed to the Morvilliers disposal facility in the Aube since 2004. As regards low- and medium-level waste, EDF is continuing to take steps to limit its storage on all nuclear sites. However, the unavailability of the Centraco plant, which deals specifically with incineration, following the accident of 12 September 2011 in one of the facility's furnaces, led EDF to evacuate a portion of the low-level waste usually incinerated directly to the Aube disposal facility, and to store it on the plant sites and at Centraco. Since 29 June 2012, when the ASN authorised Socodei to restart the incinerator at its Centraco plant, the situation is returning to normal.

For a description of radioactive waste processing downstream of the fuel cycle as well as decommissioning, see sections 6.2.1.1.3.4 ("The nuclear fuel cycle and related issues") and 6.2.1.1.3.6 ("Decommissioning of nuclear power plants").

1. At the end of 2012, the replacement of one unit out of the 23 units was in progress.

2. See glossary.

Under the authority of the ASN, a national network measuring environmental radioactivity has been established, with the aims of synthesising the results of environmental radioactivity measurements and ensuring the quality of these measurements. The regulatory measurements of environmental radioactivity around nuclear power plants have been available to the public since January 2010 on the website [www.mesure-radioactivite.fr](http://www.mesure-radioactivite.fr).

### **An ever-present nuclear safety procedure**

EDF, in its capacity as a nuclear operator, assumes responsibility for nuclear safety and reaffirms nuclear safety as its top priority within a context of rapid evolution (market competition, environmental issues, etc.).

The implementation of the French nuclear power programme led EDF to establish a safety procedure that:

- takes into account, from the design stage, the risks that might arise during the operation of the power plants, whether relating to the actual operation of the installations or to internal or external attacks;
- is based both on the application of strict rules of operation, and on the prudent and inquiring attitude of the technical teams by means of establishing a true safety culture;
- is based on the cumulative experience of a standardised fleet of 58 reactors (i.e., more than 1,500 reactor years of operation, the arithmetic sum of years of operation of EDF's PWR plants);
- incorporates a continuous improvement process that is notably embodied by ongoing efforts to decrease the number of automatic reactor trips;
- benefits from integrated nuclear engineering and R&D within the Group in order to anticipate the correction of failures, maintain the installations in good working order, develop materials/equipment on an ongoing basis, reassess safety margins, monitor technology advances as well as implementing more effective new technologies and managing work at sites being decommissioned;
- relies strongly on the development of skills; with this objective in mind, each nuclear generation site is equipped with a global simulator used for training and preparation to cope with any type of situation.

Nuclear safety is subject to numerous controls, both internal and external. The external control of the safety of nuclear facilities in France is carried out by the ASN.

At the national level:

- regulatory inspections are carried out on sites by the ASN, randomly or on a scheduled basis (approximately 418 inspections in 2012 on all EDF nuclear facilities);
- a safety re-examination process conducted on a ten-year basis has also been in place since 1990. It aims to strengthen management of compliance with safety standards for operation of nuclear plants and to reassess these standards based on feedback and new knowledge. The safety standards reassessed in this way are then set until the next re-examination (barring a major event requiring an immediate assessment). The objectives are established by the ASN (which monitors compliance), while EDF proposes solutions to meet them and implements them after obtaining ASN approval (see section 6.2.1.1.3.1 ("EDF's nuclear fleet")). The ten-year safety review is an important step in extending the operating life of power plants (see sections 6.2.1.1.3.5 ("Preparing for the future of the nuclear fleet in France") and 6.5.6.2.2 ("Specific regulations applicable to basic nuclear facilities")).

At the international level, regular inspections are held, making it possible to share the experience gained worldwide:

- the OSART (Operational Safety Review Team) of the IAEA (International Atomic Energy Agency) performs reviews at the request of the French government with the objective of formulating recommendations and promoting good working practices;
- the international "Peer Review" inspections carried out by the WANO (World Association of Nuclear Operators) are organised at the request of EDF and deal with the assessment of safety performance and also help promote best international working practices.

EDF has also implemented internal control procedures.

For example, every three to four years, EDF performs overall excellence assessments for each nuclear power plant, which take place over a three-week period and involve approximately 30 inspectors. In addition, the General Inspector for nuclear safety and radiation protection, reporting to and appointed by EDF's Chairman and Chief Executive Officer, performs audits to assess the overall safety of the nuclear fleet on an annual basis and to provide the Company's management with suggestions for improvements.

Efforts made by EDF, notably in order to improve human performance, have enabled a reduction over the last few years of the annual average number of Automatic Reactor Trips (ART)<sup>1</sup>. The year 2012 confirmed the trend observed in 2011 (30 ARTs in 2011, which is the lowest figure in the fleet's history), with 32 ARTs over the year.

EDF is subject to the law of 13 June 2006 relating to nuclear transparency and safety (see section 6.5 ("Legislative and regulatory environment")). This law guarantees access to information concerning health and environmental impacts for all individuals, and formalises transparency on nuclear safety.

### **Warning system**

In the event of an accident, a crisis plan is in place to limit impacts on the environment and on people, and to ensure that the facility is safe. This crisis plan relies on two closely coordinated plans designed for the national and local level:

- the Internal Emergency Plan (*Plan d'Urgence Interne*, or "PUI"), prepared by EDF; and
- the Special Intervention Plan (*Plan Particulier d'Intervention*, or "PPI"), prepared by French prefectures in collaboration with the French government and EDF.

In order to provide greater effectiveness and thus, improved protection of people, these plans account for the risk of malicious actions.

The relevance of the system for warning, informing and protecting people is regularly assessed through accident simulation exercises, which make it possible not only to ensure the correct operation of the crisis plan, but also to improve upon it, in particular, by clarifying roles and validating all of the required physical and human resources. Each year, approximately 100 exercises are organised for the entire French nuclear fleet, i.e., approximately one drill every three days. Approximately ten of these exercises are held on a national level, under the management of the ASN and involve EDF and the public authorities, in particular the prefectures. In 2012, 12 national exercises were organised.

1. Automatic and instantaneous shutdown of the plant by starting up protective measures to ensure its safety.

Following the initial analyses performed after the Fukushima accident in March 2011, EDF decided to enhance its crisis management strategy thanks to a national system able to quickly provide material and human aid to a site in great difficulty. Simulation exercises have been conducted using this system, known as the Rapid Response Nuclear Task Force ("FARN"), at regional bases located at Civaux, Paluel, Dampierre and Bugey. At the end of 2012, it was possible to project FARN for any unit of any site experiencing difficulties. At the end of 2015, it will be fully operational and allow simultaneous interventions on six units.

The FARN's missions are as follows:

- to act within 24 hours to support or take over from teams that have taken emergency action on the site in question, on which access infrastructures may be partially destroyed;
- to act autonomously for several days (involving logistical capabilities for support particularly in terms of feeding and sleeping) on a partially destroyed site (non-seismic tertiary buildings, for instance), in which the environment may be radioactive or even affected by chemical pollution on some sites;
- to deploy heavy protection or intervention equipment within a timeframe of a few days;
- to ensure a continuous connection with the company's Executive Management, the site's management and teams and the local authorities so as to be in a position to manage and coordinate actions;
- to prepare for actions to be carried out in the long-term, beyond the first few days of autonomy, in the event of a long-term crisis.

The FARN is intended to support the crisis planning already in place should an accident situation arise.

## Major events concerning safety

Events are measured from one to seven on the INES scale (International Nuclear Event Scale), with seven being the most serious.

Those of no consequence for nuclear safety are classified as "discrepancies" or "level 0 events".

Since the establishment of a scale of this kind in France in 1987, no level 3 event (serious incident-very low external emission, and exposure of the public representing a fraction of the regulatory limits) or above has occurred regarding the French nuclear fleet.

From 2002 to 2012, for its entire fleet, EDF recorded a yearly total of at most one level 2 event (incident with a significant failure in safety regulations). On 18 January 2012, EDF declared a major safety event with ASN, which was classified at level 2 on the INES scale. It involved the absence of a mouth on the siphon breaker valves<sup>1</sup> on the cooling pipes for the fuel storage pools in Units 2 and 3 of the Cattenom plant. Following this event, EDF undertook a systematic check of the siphon breaker valves in the fleet's storage pools. In addition, the ASN asked that changes be made to the siphon breaker valves as part of ongoing safety reviews. These changes began in 2011 and will be implemented on all pools by March 2014.

Each year, EDF handles an average of one level 1 event per reactor. The year 2012 marks a slight decline with an average number of events classified as level 1 of 1.55 per reactor (90 events). The average number of unclassified events (level 0) is 10.36 per reactor (or 601 events).

## Radiation protection

The mobilisation of ground players has allowed a continuous improvement of performance on the protection of employees against the effects of ionising

radiation. Thus, the average annual collective dose of all workers, both employees of EDF and outside companies involved in power plants, has been halved in less than ten years. In 2012, the average collective dose was 0.67 man-Sievert per reactor (or a collective annual dose of 39 man-Sievert in 2012), which is a comparable level to the average values recorded by operators for reactors using the same technology, i.e. pressurised water. Dosimetry in 2012 is slightly higher than in 2010 (0.62 man-Sievert) but lower than in 2011 (0.71 man-Sievert). EDF is proactively continuing in its ALARA approach (As Low As Reasonably Achievable), so as to manage collective dosimetry in the context of the "Grand Carénage" streamlining programme, and the associated volume of works.

EDF is committed to continuing to lower the number of individual doses of exposure to radiation below the regulatory limit. Accordingly, in 2012, none of the participants, whether EDF employees or contractors, received a cumulative dose over 12 rolling months of between 16 and 20 mSv (annual regulatory limit for the whole body) (3 in 2010, 2 in 2011).

In the coming years, given the levels already achieved, efforts will have to be focused on power plants with the poorest dosimetric results, in particular by cleaning their circuits.

### 6.2.1.1.3.4 The nuclear fuel cycle and related issues

The average annual reference volume for nuclear fuel used by reactors in the EDF fleet in France is around 1,200 tons of fuel (tons of heavy metal: natural uranium, enriched reprocessed uranium, plutonium), including around 1,050 tons of UNE fuel (natural uranium, fluorinated and then enriched), 100 tons of MOX fuel (fuel produced from reprocessed plutonium) and 50 tons of ERU fuel (enriched reprocessed uranium).

The nuclear fuel cycle encompasses all industrial operations in France and abroad which enable the supply of the fuel to generate energy in a reactor, then to unload and process it.

The cycle can be broken down into three stages:

- front-end (upstream): the processing of concentrates from uranium ore, fluorination (or conversion), enrichment and production of fuel;
- the core of the cycle corresponding to the use of fuel in the reactor: receipt, loading, operation and unloading (the fuel spends four to five years in the reactor);
- back-end (downstream) for the reactor fleet in France: pool storage, reprocessing of spent fuel, treatment of radioactive waste and recycling of reusable materials, and intermediate storage of the waste before storage, as required by the French law of 28 June 2006 on sustainable management of radioactive materials and waste.

EDF ensures the coherence of all of the operations in the fuel cycle. Generally speaking, upstream and downstream operations are carried out by subcontractors and/or suppliers, generally on the basis of multi-year contracts. EDF carries out the operations for the core of the cycle and acquires most of the raw materials as uranium concentrates ( $U_3O_8$ ). The transformations into more processed products is carried out by industrial operators through services contracts (fluorination, enrichment and manufacture). EDF is the owner in most cases and is responsible for the fuel and materials it uses throughout all the subsequent stages.

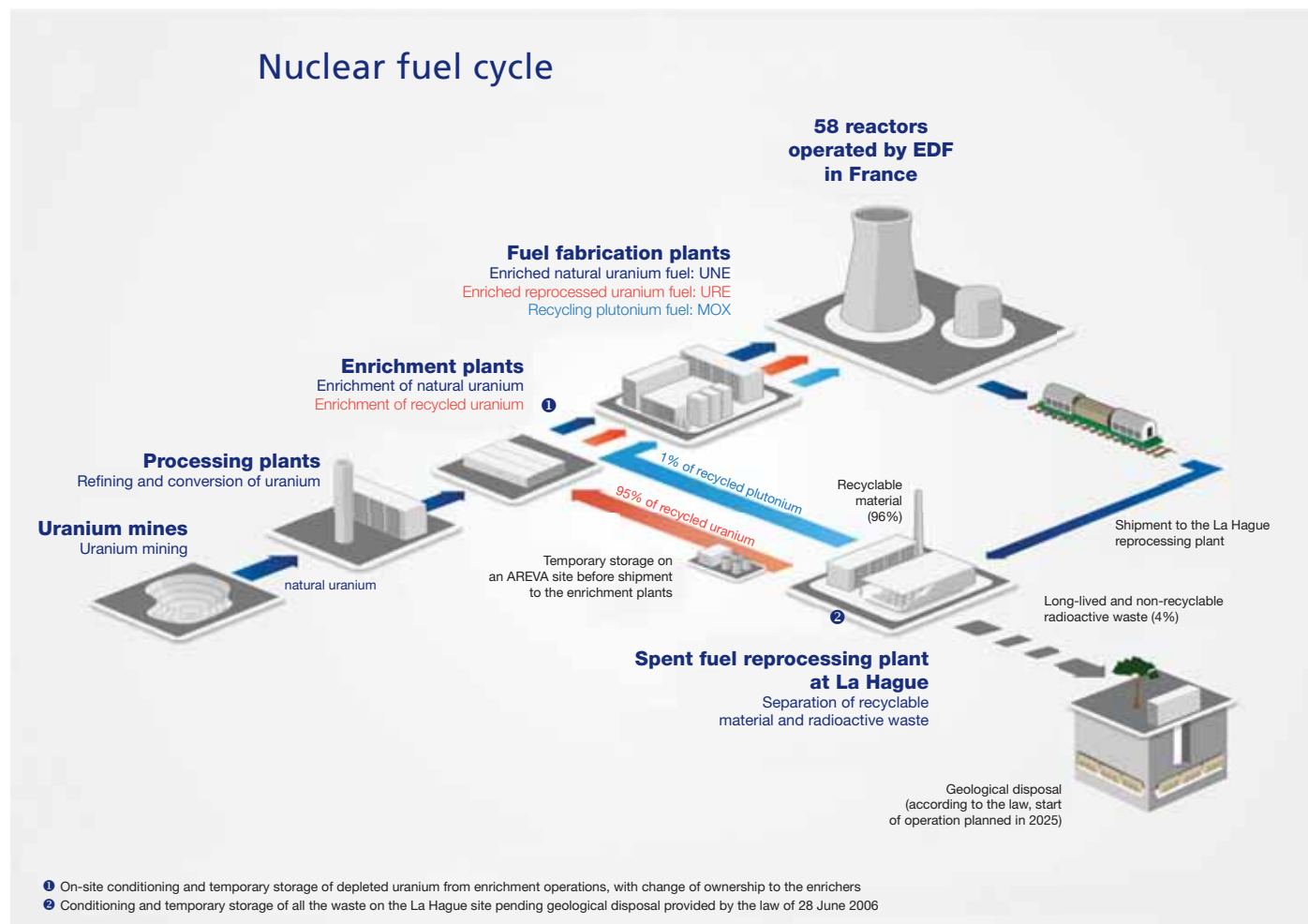
### Front-end (upstream)

As part of the integration of the Group, supplies of uranium and associated services (conversion, enrichment) for EDF and its subsidiary EDF Energy have been pooled since 31 March 2010.

1. A siphon breaker valve is built on the water injection pipe near the surface of the fuel storage pools. It aims to prevent any siphoning that might lead to a decrease in the water level in the pool.



The diagram below shows the different stages of the nuclear fuel cycle in France:



In order to ensure the continuity and security of the supply of its reactors in France and the United Kingdom, EDF retains overall control of all operations at each stage of the cycle, and manages a portfolio of contracts with a long-term perspective.

By stockpiling fuel at different stages of the front-end stage of the fuel cycle (natural uranium, fluorinated enriched or unenriched uranium, and warehousing of new fuel assemblies), EDF seeks to avoid resorting to the short-term market in the event of production hazards in mines or plants in the cycle. These inventories provide guarantees in terms of supply and price security, on commodity markets and upstream services, which may experience significant variations.

#### Natural uranium supply

Most of EDF's uranium supplies are guaranteed in the long-term by contracts for periods of 7 to 20 years already signed, or by reciprocal commitments that will ultimately be confirmed by definitive contracts (options guaranteeing access to volumes subject to conditions of price negotiation, for the end of the period of cover). The primary objective of this long-term supply policy is to guarantee the long-term security of EDF's supplies and it also contributes to partial hedging of the price risk.

For its natural uranium needs, EDF has implemented a policy of diversification of its supply sources in terms of the origins and suppliers of its supply sources. This policy helps to strengthen the supplies coming from high-potential areas, such as Australia, Canada and Kazakhstan. In this context, EDF signed an agreement in 2012 with the Australian producer Paladin Energy for a total

of approximately 5,000 tons of natural uranium for a period of six years, from 2019 to 2024.

The AREVA Group remains an important supplier. As part of the continuity of decisions made by the Nuclear Policy Council on 21 February 2011, EDF and AREVA agreed in February 2012 to the principles of a partnership dealing specifically with the supply of uranium that contributes to securing EDF's supply in the long-term. In this context, EDF and AREVA signed two contracts in 2012 to ensure the supply of approximately 30,000 tons of uranium over the period 2014-2035.

Indexation formulas for portfolio contracts of natural uranium supply include fixed prices (basic prices whether inflated or not) and variable prices (indexed according to market price indexes) and are sometimes limited by floor and ceiling prices. Consequently, the effects of variations in the rise in market prices of natural uranium on supply costs are limited and smoothed out while enabling a benefit from potential decreases in price.

#### Fluorination (or conversion)

A significant part of EDF's needs are covered by the Comurhex plant of the AREVA Group, as well as other international producers, such as Cameco in Canada and the United Kingdom, Converdyn in the United States and Tenex in Russia.

Contracts that EDF signed in 2007 and 2008 strengthen the cover of EDF's needs in conversion services for approximately the next ten years.



### Enriching natural uranium into Uranium-235

In order to secure its supply in enrichment services under competitive conditions, EDF secured significant coverage of its needs, from enrichers such as Urenco (United Kingdom, Germany, the Netherlands, United States), Tenex (Russia).

Meanwhile, in 2008 EDF and AREVA entered into a long-term agreement that defines the terms and conditions under which EDF will take some of the future production, starting in 2013, from Georges Besse II, a new AREVA facility based on ultra-centrifugation, to replace the facility that used gas diffusion. Gradually, a significant portion of the enrichment services supplied by EDF will come from this new plant.

As a result, the service coverage of enrichment needs for EDF's fleet in France and the United Kingdom both installed and under construction has thus been reinforced until the post-2020 period on the basis of predominantly fixed-price contracts, decreasing in real terms.

### Enriched reprocessed uranium – ERU

This reprocessing makes it possible to recycle uranium from processing spent fuel, which represents approximately 95% of the spent fuel mass. The reloads provided by this reprocessing are carried out at the units of the Cruas power plant.

Reprocessed uranium that is not currently in use is stored in a stable form to be used at a later stage, depending on market trends for natural uranium.

### Fuel assembly manufacturing

Contracts with the fuel assembly manufacturers AREVA NP and Westinghouse were renewed in 2012 for the period 2013 to 2014, and include provisions relating to product development.

Most of EDF's needs are covered by the contract signed with AREVA NP.

### Managing fuel in the reactor core

EDF has implemented a strategy aimed at gradually increasing the performance of nuclear fuel for its different series, which has increased fuel energy efficiency and optimised operating cycles in order to increase the availability of the nuclear power plants and optimised operation cycles to increase power plant availability, while ensuring shutdown criteria that are consistent with the seasonal variation of demand. As a result, EDF chose production cycles of 12 to 18 months for its fleet (see section 6.2.1.1.3.2. ("Operation and technical performance of the nuclear fleet")).

### Back-end (downstream) in France

EDF is responsible not only for what becomes of its spent fuel and how it is processed, but also its associated waste. AREVA is responsible for processing and ANDRA is responsible for long-term management operations for the storage of ultimate waste, in accordance with the law of 28 June 2006 on sustainable management of radioactive materials and waste.

EDF's currently adopted strategy with regards to the fuel cycle, in agreement with the French government, is to process spent fuel and to recycle the plutonium separated in the form of MOX fuel. The quantities handled are determined by the amount of recycled plutonium in reactors allowed to load MOX fuel. Recycling capacity has allowed the processing of almost 1,050 tons of spent fuel per year.

### Processing spent fuel from EDF's nuclear power stations

Spent fuel awaiting processing is temporarily stored underwater in the cooling pools, under conditions that are recognised as being safe over periods of several decades. At the end of a period of approximately 15 years after spent  $\text{UO}_2$  fuel has been unloaded from the reactor, it is processed at AREVA's La Hague site in order to separate the products that can be recycled from the waste. The waste is subsequently conditioned and temporarily stored at this site in specific premises.

The relationship between EDF and AREVA concerning the transport, processing and recycling of spent fuel was formalised for the 2008-2040 period by the above mentioned framework agreement signed on 19 December 2008. The contractual implementation of this framework agreement led to the signing on 12 July 2010 of a processing-recycling agreement and the protocol for waste recovery and treatment and the permanent shutdown and decommissioning of the plant at La Hague ("RCD-MAD/DEM" protocol).

The processing-recycling agreement covers:

- the transportation of spent nuclear fuel from EDF's power plants to La Hague reprocessing plant, and its intermediate storage;
- the separation of the fuel materials that can be recycled (uranium and plutonium) from high-level waste, and their conditioning;
- the conditioning of radioactive waste extracted from spent fuel;
- the intermediate storage of the conditioned waste pending discharge to a storage centre;
- recycling of plutonium in the form of MOX fuel;
- the oxidation and intermediate storage of reprocessed uranium (see "Enriched reprocessed uranium – ERU" above).

For the 2008-2012 period, this agreement sets the prices and quantities of services delegated to AREVA by EDF. In this context, it provides for an increase of the annual quantities of processed spent fuel and MOX fuel to approximately 1,050 tons and 120 tons, respectively, between 2010 and 2012. Negotiations are underway with AREVA to define treatment and recycling conditions starting in 2013. Pending the finalisation of the negotiations, EDF and AREVA signed an interim agreement which allows the renewal in 2013 of the conditions applied during the period 2008-2012. The RCD-MAD/DEM protocol defines EDF's contribution to the costs of decommissioning the facilities at La Hague, for which it sets the full and final amount to be paid to AREVA by EDF. The final payment was made in 2011.

### Storing conditioned ultimate waste

Radioactive waste, depending on its nature, level of radioactivity and the lifespan of its radionuclide components, has been classified into different categories: from high-level waste (HLW), to medium- and low-level waste (MLW and LLW), to very low-level waste (VLLW). It is called "long life" when it remains active for more than 30 years and "short life" otherwise.

### Long-lived high-level waste

The processing of spent fuel enables the vitrification of long-lived high-level waste, which provides very high-quality packaging with a reduced volume. The waste is then temporarily stored at La Hague in specific facilities. All of the high-level long-life waste produced in this way, corresponding to the operation of the early natural uranium gas graphite plants (NUGG) and to 40 years of operation of the current PWR facilities, will represent a volume of approximately 6,700 cubic metres.

On the basis of the works and research carried out in the context of the law of 30 December 1991, the law of 28 June 2006 defines a long-term management programme for long-life, high-level waste, retaining geological storage as a benchmark solution in its national plan for radioactive materials and waste management: "[...] following intermediate storage, ultimate radioactive waste that cannot be stored at surface level or at a shallow depth for nuclear safety or radiation protection reasons, is to be stored in deep geological layers." The law specifies in particular that "in order to ensure [...] the management of long-lived high- or medium-level radioactive waste, exploration and studies relating to such waste shall be pursued [...] in particular the reversible storage in deep geological formations [...] to choose a site and create a storage centre, so that the application for its approval [...] can be examined in 2015 and, subject to this approval, the centre began operation in 2025" (for more questions about the law of 28 June 2006, see section 6.5.4.2.2 ("Specific regulations applicable to basic nuclear facilities")). This schedule was confirmed by the Nuclear Policy

Council on 28 September 2012. ANDRA thus took the matter before the National Public Debate Commission on 9 October 2012 to organise a public debate in 2013 on this project. The High Committee for Transparency and Information on Nuclear Safety ("HCTISN") was asked by ANDRA to establish think tanks upstream of the public debate.

The geological storage project is now entering its industrial phase and must confront new challenges in order to produce a facility that is industrially and economically sound, compliant with the safety requirements published by the French Nuclear Safety Authority (ASN), and executed consistently from design to completion with an ongoing objective of technical and economic optimisation. To meet this challenge, the best design principles should be settled on for the project going forward and the best organisation decided to ensure the success of the industrial design and construction phases.

Since early 2012, ANDRA has been conducting preliminary studies to select the design options that will be included in the decree authorising the creation of the Industrial Centre for Geological Storage (Cigéo).

At the request of the French government's Directorate-General for Energy and Climate (DGEC), a partnership agreement was implemented between ANDRA and operators to enable the planned industrial facility for geological storage to benefit from operators' skills and experience.

Geological storage costs are being discussed by a working group lead by DGEC, which is scheduled to issue its conclusions in 2013, in time for the public debate previously mentioned.

#### **Long-lived medium-level waste**

The structures of the assemblies (shells and nozzles, clad pieces, etc.), separated during the processing of spent fuel, constitute long-lived medium-level waste, with a lower activity level than long-lived high-level waste. They are currently compacted and conditioned in stainless steel containers. The total volume of long-lived MLW, including the waste resulting from the operation of the NUGG fleet and that resulting from 40 years as a benchmark operator of the PWR fleet, will be about 37,000 cubic metres. Unlike long-lived high level waste, it does not generate heat and thus is suitable for faster storage than long-lived high-level waste because it does not require a long cooling off period before storage.

As with long-lived HLW, long-lived MLW is temporarily stored in dedicated installations in La Hague pending decisions on the storage of nuclear waste in deep geological layers, which will be made under the law of 28 June 2006.

#### **Long-lived low-level waste**

Long-lived, low-level waste belonging to EDF comes from the decommissioning of the old NUGG reactors (graphite, processing waste – see section 6.2.1.1.3.6 ("Decommissioning of nuclear power plants")). Given its lifespan, this waste cannot be stored in existing surface facilities (see below), but due to its lower level than that of long-lived high- and medium-level waste, the law of 28 June 2006 provides for special subsurface storage. The search for a site launched by ANDRA in 2008 yielded no results. To allow time for consultation, the French government decided in 2010 to remove the time constraints of the long-lived low-level waste storage project. Within the scope of the National Plan for the Sustainable Management of Radioactive Materials and Waste (PNGMDR) 2010-2012, and in partnership with ANDRA, nuclear operators studied alternative management scenarios that integrate graphite processing and intermediate storage solutions. In late 2012, ANDRA submitted to the public authorities a report proposing the resumption of the site search efforts.

#### **Short-lived medium- and low-level waste and very-low-level waste**

Short-lived medium- and low-level waste comes from nuclear installations (gloves, filters, resins, etc.). It is stored on the surface at the Soulaines storage centre, managed by ANDRA, which is designed for low and medium-level waste.

Very-low-level waste is waste in which the radioactivity is very close to natural radioactivity. It mainly arises from the decommissioning of nuclear installations, primarily from rubble (concrete, scrap, lagging, piping, etc.). This waste is stored on the surface at the Morvilliers storage centre managed by ANDRA.

In order to minimise volumes, some waste is treated beforehand by fusion or incineration at the Centraco plant owned by Socodei, a subsidiary of EDF. On this site, an industrial accident occurred on 12 September 2011 in a metallic waste fusion furnace, causing the death of one employee and injuring four others. The accident, brought under control without any chemical or radioactive discharges, was rated by the ASN as level 1 on the INES scale. On 29 June 2012 the ASN authorised Socodei to restart the incinerator, which enabled it to resume the treatment of the waste temporarily stored onsite at nuclear plants (see section 6.2.1.1.3.3 "Environment, safety and radiation protection").

#### **Consideration of future charges relating to the management of spent fuel and long term management of radioactive waste**

Each year, EDF makes provisions for the downstream side of the nuclear fuel cycle in France (see Notes 29 and 48 to the consolidated financial statements for the year ended 31 December 2012) that cover the management of spent fuel (including fuel in the reactor but not yet irradiated) and the long-term management of radioactive waste.

To assess the future management costs of long lived, medium- and high-level waste resulting from the processing of burnt fuel, EDF assumed the use of deep geological storage of waste, pursuant to the law of 28 June 2006, which established the storage of waste in deep geological layers as a benchmark solution.

For long-lived, low-level waste from the decommissioning of shutdown NUGG power plants, EDF establishes provisions using the forecast wastes production schedules and cost assumptions relating to the means of storage defined by ANDRA.

The cost of removing and storing short-lived medium- and low-level waste and very-low-level waste is determined on the basis of contracts entered into with ANDRA and the various carriers for the operation of existing storage centres. The costs of disposal and storage of waste from the decommissioning of power plants are provided for, with the expenditures relating to operating waste being included in annual expenses.

EDF's provisions as at 31 December 2012 were established in accordance with the provisions of the law of 28 June 2006 and implementation texts published in 2007. According to them, the new geological storage costs should be updated by ANDRA and after advice of the ASN and the nuclear operators, the minister in charge will make it public end 2013.

#### **6.2.1.1.3.5 Preparing for the future of the nuclear fleet in France**

EDF believes that nuclear power currently constitutes a sustainable and economically efficient response to future energy needs: it allows relative energy independence thanks to considerable uranium reserves worldwide, which are more than sufficient to meet projected global demand by 2035 (IEA, *World Energy Outlook* 2012), and nuclear energy is also an energy that does not emit CO<sub>2</sub>, an essential asset in the context of climate change.

The development of new-generation nuclear reactors (called fourth generation, see section 11.2.1 ("Consolidate and develop a carbon-free energy mix")) will enable the level of consumption of natural uranium to be reduced significantly and the level of these energy reserves to be increased to several thousand years.

In addition, the Nuclear Policy Council met on 28 September 2012 and reaffirmed France's confidence in the French nuclear industry and technology and the continuation of the Flamanville EPR project.

For EDF, preparation for the future of the nuclear fleet rests on the following strategic areas:

- the implementation of technical conditions for the extension of the operational lifespan of functioning nuclear power plants to 60 years:
  - continued safety improvements, primarily by integrating lessons learnt from the Fukushima accident in Japan, and
  - implementation of a preventive policy with respect to the aging or obsolete equipment;
- the building of a first EPR unit in Flamanville;
- optimising the EPR by capitalising on Group feedback and the development of new model third-generation reactors (1,000MW and 1,500MW) (see section 6.1.4.3 ("Investments to 2015")).

## Extension of functional lifespans of operating units to 60 years

### Additional Safety Assessments ("ASA") following the Fukushima accident

Further safety assessments of French nuclear power plants followed the Fukushima accident in Japan in March 2011 and are part of a twofold framework: the Prime Minister's request that ASN seized on to carry out this mission and the European Council's request following its meeting on 24 and 25 March 2011.

The consistency of both procedures is ensured by the common reference to specifications put forward by the Western European Nuclear Regulator Association (WENRA), and by the subsequent organisation of "peer reviews" by all European safety authorities meeting as the ENSREG (European Nuclear Safety Regulators Group). Each of the national safety authorities then exercises its regulatory responsibility by pursuing specifications established on a national basis.

On 15 September 2011, EDF submitted its 19 additional safety assessment reports to the ASN for its existing and forthcoming nuclear sites.

Drafted for the site as a whole, these assessments consisted of reassessing the defences of the existing power plants and those under construction, in light of the events in Japan, taking into account those topics previously set down in the specifications drafted by the authorities. In particular, the safety margins were reassessed against the risks of earthquake and flood, when dealing with situations of simultaneous loss of the cooling source and power supplies and the consequences of severe accidents. These assessments also led us to inquire whether slight change to the scenarios planned beyond situations taken into account for dimensioning the protection systems, would be enough to make the consequences worse in terms of safety ("off-the-cliff effects") and finally to consider deterministically the extreme situations that substantially exceed those used in the design of nuclear installations and subsequent safety reviews. EDF's nuclear fleet is based on the principles of continuous improvement. Both existing and new facilities thus continuously benefit from feedback from all power plants, and can learn lessons from accidents occurring throughout the world.

Finally, ASAs also re-examined the rules applied to the field of outsourcing. These analyses confirmed first and foremost the good level of security throughout the EDF nuclear power fleet, particularly because of the periodic safety reviews carried out in France since the 1980s and since codified by the law on nuclear transparency and safety (the "TSN Law") in June 2006. EDF also proposed additional measures to ASN that would strengthen the consideration of situations that exceed those considered for dimensioning safety systems, and to contribute to further raising the current safety level of power plants.

In its opinion to the government published on 3 January 2012, the ASN states, on the basis of the analyses of its technical support, that *"after the additional safety assessments on priority nuclear facilities, the ASN considers that the facilities examined show a sufficient level of safety, and that it will not thus request the immediate shutdown of any of them"*. At the same time, the ASN considers that *"continuing to operate these facilities requires an increase in their robustness as soon as possible, to an extent beyond that set down in the existing safety margins, to cope with extreme situations"*.

The ASN also acknowledged the "hard core" concept and the FARN system (see section 6.2.1.1.3.3 ("Environment, safety, and radiation protection")). The "hard core" will be made up of a restricted number of the plant's structures, systems and components that can withstand attacks that go beyond provisions and that can deal with situations studied in connection with ASAs (attacks above the levels considered in the safety standards, loss of cooling functions or long-term electricity sources affecting several facilities on the same site).

Following the publication of ASN's advisory to the government, the cost of security work post-Fukushima was valued at €10 billion euros in 2010. On 26 June 2012, the ASN made 19 decisions requiring EDF to follow over six hundred technical requirements, which reflect regulatory requirements in the post-Fukushima action plan defined after further safety evaluations. These technical rules require that all nuclear sites must have a robust organisation and local crisis centres resistant to the occurrence of a large-scale event affecting several installations. For EDF plants, the "hard core" recommended shall, at first, include "bunkerised" electrical means that must be in place everywhere by 2018; at the end of 2013, temporary emergency diesel generators should be installed. The complete definition of the hard core will be by early 2013 defined through regulatory technical requirements from the ASN. The decisions published in June 2012 also confirmed the implementation of the FARN (see section 6.2.1.1.3.3 ("Environment, safety and radiation protection")). The work undertaken in the wake of the Fukushima accident will extend over several years and EDF will continue to mobilise its expertise and the resources of the industrial sector to study and achieve all of these improvements to meet the recommendations of the ASN.

### Operating life of EDF's PWR fleet

The 2006 TSN law (*Transparence et Sécurité Nucléaire* or "Nuclear Safety and Transparency") does not set a limit on service life, but requires a safety review of the facility every ten years in light of best international practices ("safety standards").

As part of the studies related to the third ten-year inspections of the 900MW series, in early July 2009 the ASN publicly stated that it had not identified a generic problem that called into question EDF's ability to control the safety of its 900MW reactors for up to 40 years.

The ASN's generic opinion is supplemented by an opinion on each reactor. After the ten-year inspection of each reactor of the 900MW series, the ASN issues an authorisation for its restart. Six months after the restart of a reactor following its ten-year inspection, the operator submits a safety review to the ASN, based on which the safety authority decides on additional technical requirements to be implemented by the operator in order to continue to use the relevant reactor for another ten years.

The Tricastin 1 unit is the first to have undergone the entire process necessary to continue operations for up to 40 years, resulting in a positive opinion issued by the ASN on 4 November 2010 regarding the unit's suitability to continue operating for an additional ten years after its third ten-year inspection. In line with the technical instructions issued on that occasion by the ASN, EDF will complete the works undertaken to reinforce the Donzère Mondragon hydropower plants by the end of 2014 and thus provide appropriate protection for the nuclear power plant against the risk of flooding in the event of a maximum thousand-year flood.

The Fessenheim 1 unit is the second to have reached the end of this process: it completed its third ten-year inspection in March 2010, after which the ASN gave a positive opinion on 4 July 2011 regarding the unit's suitability to continue operating for an additional ten years; this opinion was given on the condition that the base of the reactor be strengthened before mid-2013 and that technical back-up provisions be implemented to remove residual power in the long-term following a loss of cooling source. The 2<sup>nd</sup> Fessenheim unit also completed its third ten-year inspection in March 2012, after which the reactor was authorised to restart. For these two units and for others, EDF is committed to performing additional work in accordance with the conditions recommended by the ASN (concerning the decisions on Fessenheim, see section 6.5.8.2 ("Future regulations at national level")).

The Bugey 2 unit also completed its third ten-year inspection in 2010, after which the ASN authorised its continued operation for an additional ten-year period.

Lastly, the Bugey 4 and 5, Dampierre 1 and 2, Tricastin 2 and 3, Gravelnes 1 and 3 and Blayais 1 units also completed their third ten-year inspections in 2012.

EDF's industrial strategy is to operate the fleet beyond 40 years in optimal conditions of safety and performance particularly in view of the significant investment made in connection with the third ten-year inspections and other improvements post-Fukushima. This target is consistent with trends observed around the globe for similar technologies (PWR). To this end, EDF has implemented industrial and R&D action plans. Actions were undertaken to renew those major components that could be renewed (see section 6.2.1.1.3.2 ("Operation and technical performance of the nuclear fleet")) and solutions are being studied to demonstrate the capacities of equipment that is considered to be non-replaceable, such as the reactor vessel and containment facilities, to ensure they can operate for 60 years.

With regard to safety upgrades planned by EDF in order to extend its plants' operating life to 60 years, a first meeting with the ASN was held in September 2010 to present the main strategies. The ASN had these improvements examined on 18-19 January 2012 by the permanent "reactors" group composed of experts commissioned by it. The permanent group approved the proposals and recommended that they be completed and in certain cases strengthened. These improvement proposals are reviewed and assessed in view of the lessons learnt from the Fukushima accident.

Twenty-four nuclear units are expected to have their fourth ten-year inspections between 2019 and 2024. Shutting down these units would require from now on major investments in new nuclear units.

While respecting the main priority, that of safety, an extension to the operating lifespan of the current nuclear fleet would enable:

- the most to be made of the industrial asset base it represents;
- the deferral of financial flows associated with decisions concerning investment in these new plants beyond 2025; and
- spreading the time period for the commissioning of new plants, which is beneficial from an industrial point of view.

### **An update on the Flamanville 3 EPR (European Pressurized water Reactor) project**

#### **Architect-assembler engineering**

To complete the Flamanville 3 EPR project, EDF wanted to preserve the role of architect-assembler, which corresponds to the position adopted by EDF during the development, renovation or decommissioning of its generation assets, and is based on its internal engineering capabilities. This role allows the direct control of the design and operation of its power plants, the organisation of development projects, the schedule and costs of construction, its relations with the ASN, and the direct integration of operating feedback.

#### **Project launch phase**

In October 2004, EDF's Board of Directors decided to undertake the process of building an EPR nuclear generation unit in France located in Flamanville that was consistent with the programme law that set energy policy guidelines (the so-called "POPE Law").

A public debate was organised by the French Commission for Public Consultations (CNDP) concerning the construction of an EPR reactor initial series unit the authorisation decree creating the Flamanville 3 nuclear power plant was issued on 11 April 2007. On 28 September 2012, the Nuclear Policy Council reaffirmed the continuation of the EPR project in Flamanville.

Several appeals were made by associations against some administrative authorisations, one of which is ongoing at the Administrative Court in Caen (see section 20.5.1 ("Legal proceedings concerning EDF")).

#### **Studies**

Completion studies are ongoing to produce the working documents and ensure the smooth running of the construction on-site.

#### **Interaction with the Nuclear Safety Authority**

In October 2010, EDF submitted to the Nuclear Safety Authority (ASN) a first working version of the Flamanville 3 commissioning file to allow them to begin studying it ahead of completion. The submission of the final version of this document is required one year prior to the loading of the reactor with fuel (2015). The ASN also believes that the changes made by EDF to the control systems architecture of the EPR are satisfactory with regard to the request made in October 2009, for supporting documentation and review of alternative design features.

#### **Supply and work contracts**

At the end of 2012, EDF awarded 200 contracts, representing more than 99% of the total budget. The six largest contracts (boiler, civil engineering, control systems, piping, offshore works and discharge tunnel, generator-condenser-water station) represent approximately 70% of the project budget. All of the main contracts, with the exception of the boiler contract signed with AREVA, were awarded following international calls for tender.

#### **Equipment manufacturing**

The manufacture of the equipment required for construction is now well advanced. The first major components were delivered on-site in 2010, while major components for the turbine section were delivered in 2011, and most of the equipment for the nuclear section will be available in 2013-2014.

Following the detection of faults on several of them, EDF decided to replace the 45 polar crane support brackets for the reactor building. These are metal boxes arranged around the circumference of the reactor building on which the movable bridge for the handling of the fuel and the introduction of new components such as tanks and steam generators will lean. At the end of December 2012, the new brackets were all assembled on site.

#### **Work on site**

After a preparatory phase which began in summer 2006, the construction of the EPR reactor Flamanville 3 has been underway since December 2007 (first concrete poured). In 2012, important steps in the construction were completed:

- installation of inlet for supplying sea water from the pumping station; the sea water is needed to cool the circuits;
- completion of the installation of the turbine generator with the establishment of the alternator rotor in the engine room;



- installation of the brackets for steam generators and primary pumps in the reactor building;
- completion of principal civil engineering work for the four safeguard buildings.

After replacement of brackets, filling of the enclosure with concrete will resume in early 2013.

The progress in terms of civil engineering at the end of 2012 is 94%, and the progress on electromechanical assemblies is 39%.

## Commissioning schedule and budget

In December 2012, EDF submitted an upward cost revision for the construction of the Flamanville 3 project of €2 billion constant added to the previous estimate (July 2011) of €<sub>2008</sub>6 billion. This revaluation reflects industrial hazards, including the replacement of the polar crane support brackets for the reactor building. Besides the "initial series" effect, Flamanville 3 is the first nuclear power plant built in France for 15 years, some factors have weighed down this full cost. Thus this cost takes into account additional engineering studies, the integration of new regulatory requirements and post-Fukushima lessons learnt. EDF also included additional expenses related to industrial hazards, such as replacing polar crane support brackets and its impact on the development of the work schedule (see above, "Production of equipment"). The objective of first marketable production is maintained for 2016.

## Industrial partnership with Enel

A cooperation agreement between EDF and Enel signed on 30 November 2007 provided for a 12.5% financial participation by Enel in the Flamanville 3 project in return for a equivalent share of electricity generation for the operational lifetime the plant. Given the changes to the economic environment and the Flamanville 3 project, as well as the abandonment of the revival of the Italian nuclear programme, Enel wanted to get out of the Flamanville 3 project, effective 19 December 2012. EDF reimbursed Enel for the amount of its investment in the project (principal and penalties) for an amount of €658 million and in return received all electricity generated by Flamanville 3.

## Result of the Additional Safety Assessment for the EPR

The additional safety assessment was also conducted on the EPR under construction, bearing in mind that this reactor draws its robustness from its initial design. The response times to be implemented are compatible with the schedule.

Regarding the EPR, the analysis by the ASN's Permanent Group of Experts on 8, 9 and 10 November 2011 show that the design of the power plant currently under construction in Flamanville already affords increased protection in terms of serious accidents of the type witnessed in Fukushima. In this context, the Permanent Group consider that EDF must identify, from the planned equipment, that equipment intended for the "hard core" relating to preventing and limiting the consequences of a serious accident. This analysis was confirmed by the ASN report on the Additional Safety Assessments.

## Penly 3

On 30 January 2009, the French President confirmed the construction on the Penly (Seine-Maritime) site of a second EPR-type nuclear reactor, which will be built by EDF. The work carried out as part of the preparation for this project was suspended in mid-2012 in anticipation of a redefinition of the basic outlines of this project.

### 6.2.1.1.3.6 Decommissioning of nuclear power plants

EDF takes full regulatory, financial and technical responsibility for the decommissioning of its nuclear power plants. For EDF, the issue is to demonstrate, through the decommissioning process, its control of the entire life cycle of the means of nuclear power generation.

The decommissioning of nuclear power plants involves three levels, according to a classification defined by the International Atomic Energy Agency (IAEA) in 1980:

- Level 1: shutdown of the plant, fuel unloading, draining of circuits (99.9% of radioactivity is eliminated), followed by final shutdown: dismantling of non-nuclear facilities that are permanently decommissioned, with access limited to monitored facilities;
- Level 2: dismantling of non-nuclear buildings and nuclear buildings excluding the reactor building, conditioning and evacuation of waste to storage facilities, isolation – containment – the section of the facility surrounding the reactor is kept under surveillance;
- Level 3: full dismantling and removal of the reactor building, materials and equipment that is still radioactive; monitoring is no longer necessary. After these operations, the site can be used for industrial purposes once again.

In general, the operations leading to Level 1 and then to Level 2 are conducted consecutively over a period of time of approximately five to ten years after the reactor ceases production. A waiting period may occur between the end of operations leading to Level 2 and the beginning of operations leading to Level 3, in order to allow the radioactivity in the irradiated materials to decay. The length of this waiting period may vary, depending on the comparative interest of radioactive decay and the length of time the facility must be monitored and can depend on the re-use envisaged for the site. At the end of this waiting period, the length of time spent on operations leading to Level 3 is estimated to be approximately ten to 15 years. Furthermore, conventional buildings can be kept and used during decommissioning.

The reference scenario adopted by EDF since 2001 is a decommissioning without a waiting period, in line with French regulations, which provide for a decommissioning *"in as short a time as possible between the final shutdown of facility operations and its dismantling"* (see decree of 7 February 2012 laying down general rules for Basic Nuclear Installations).

The regulatory process for decommissioning is governed by the TSN Law and its implementing Decree No. 2007-1557 of 2 November 2007 (see section 6.5.6.2.2 ("Specific regulations applicable to basic nuclear facilities")). It is characterised, for a given site, by:

- A single decree allowing for complete decommissioning, following agreement from the ASN;
- key meetings to be held with the ASN, integrated in a safety reference system relative to final shutdown and decommissioning;
- an internal authorisation procedure for the operator, independent of the operational staff and audited by the ASN, and allowing work to be started within the authorised safety reference limits;
- preliminary phases before obtention of the decre during which:
  - at least three years before the final shutdown, the operators must provide a set of documents to its supervisory authorities and the ASN (Art. 37 of the decree n° 2007-1557) precisising the terms for decommissioning (Art. 40);
  - the obligation to carry out consultations and public inquiries (Art. 38).

## Decommissioning of first-generation power plants that have been shut down

EDF has chosen to completely dismantle power plants that have been shut down (one PWR at Chooz A, one heavy-water reactor (HWR) at Brennilis, one fast neutron reactor at Creys-Malville and six NUGG-type reactors at Bugey, Saint-Laurent and Chinon) by 2035, following the delay by ANDRA in commissioning the long-lived LLW storage. The sites remain the property of EDF, and they will remain under its responsibility and monitoring.

Given its role as responsible owner, EDF will act as the contracting authority for the decommissioning.



The decommissioning of EDF's nine shutdown first generation units will produce approximately 1,000,000 tons of primary waste materials, of which 80% is standard waste material and none is high-level waste. The remaining 20% comprises very low to medium-level waste including about 2% waste requiring the availability of an long-lived LLW storage facility.

Existing means of very low-level and low- and intermediate-level waste disposal will be supplemented by:

- the project to build a packaging and interim storage installation for radioactive waste (ICEDA), launched at the Bugey site. The public inquiry, held in June and July 2006, led to a favourable opinion and a decree on 23 April 2010 authorising EDF to build the facility. At the same time, appeals against the decree and the building authorisation were lodged (see section 20.5 ("Legal proceedings and arbitration")); the Administrative Court of Lyon cancelled the ICEDA building permit due to violation of the zoning plan for the town concerned. Work was therefore suspended in early January 2012. EDF is implementing all regulatory means to restore the administrative situation relating to the building permits;
- the long-lived LLW storage facilities provided for under the law of 28 June 2006 concerning the long-term management of radioactive material and waste. The site search begun by ANDRA in 2008 did not bear fruit, and in order to provide the time needed for consultation, the government decided in 2010 to lift schedule restrictions on the long-lived low-level waste storage project. ANDRA issued a report to local authorities in late 2012 suggesting that the site search be resumed (see section 6.2.1.1.3.4 ("The nuclear fuel cycle and related issues")).

The decommissioning process for the Chooz A and Creys Malville plants continues. Chooz A is a technology similar to 58 units in operation, a pressurised water reactor, but an older design. The situation of the reactor, which is in a rocky cave in the hillside, also creates very specific conditions.

Concerning Brennilis, pursuant to an agreement in 2008 with the CEA, EDF has become fully responsible for its decommissioning<sup>1</sup>. EDF submitted a new application to the ASN for authorisation to decommission the Brennilis plant in late July 2008. This submission followed the decision of the State Council on 6 June 2007 to cancel the decree authorising EDF to carry out the complete decommissioning of the reactor. The reason for the cancellation was the failure to make available the public before publication of the decree a impact study for the deconstruction of the plant. Following this decision, EDF took steps in 2007 to ensure that the facility would not pose a threat while the decommissioning work was halted. The public inquiry was held from 27 October to 11 December 2009. The inquiry gave an unfavorable opinion of the project on 15 March 2010 that was, however, accompanied by a recommendation to carry out certain works. A decree published in the *Journal Officiel* on 28 July 2011 enabled the partial decommissioning of the power plant to be resumed and finalised. The decommissioning included in the scope of the decree is ongoing. However, final and complete decommissioning will be covered by an additional decommissioning decree, for which EDF lodged a request on 29 December 2011. In accordance with the opinion that ASN had expressed, the Mission for National Security and Radiation Protection notified to EDF in December 2012 that the inquiry for the application for authorisation to complete the decommissioning Brennilis cannot be pursued in its current state due to the cancellation of the ICEDA building permit. EDF is analysing the consequences of this decision.

As regards the six natural uranium/graphite gas reactors (NUGG), construction is at a less advanced stage. Since the EDF decommissioning programme provides for a direct disposal of graphite for its power plants at the long-lived low-level waste storage centre, the lengthening of availability period by ANDRA of storage centres delays the progress of works.

## Decommissioning costs

### EDF nuclear power plants

Since the beginning of operations at its power plants, EDF has made provisions to cover decommissioning operations, engineering, surveillance and maintenance of facilities, and site security (see section 20.1 ("Historical financial information"), note 29.1.3 to the consolidated financial statements for the year ended 31 December 2012). The accrued amounts correspond to EDF's estimate for decommissioning costs incurred in order to reach Level 3. Since the end of 2007, in accordance with the provisions of the law of 28 June 2006 and its implementing legislation, the part corresponding to the management of the long-term radioactive waste from decommissioning has been grouped with all provisions of nuclear waste. Therefore, the amounts provided for decommissioning concern strictly industrial operations only.

As regards the first generation plants that were shut down, their technologies are very different from one another (NUGG, HWR, PWR and FNR). Decommissioning costs were assessed based on estimates made in 2008 and reviewed in 2012 taking into account accumulated industry experience, regulatory and technical issues encountered and the development of technical and regulatory assumptions. Unlike the PWR facilities that are in operation, first-generation reactors at shutdown are very different from each other and the estimated decommissioning costs have been established reactor by reactor. There is a provision for decommissioning in the EDF financial statements (see section 20.1 ("Historical financial information"), note 29.1.3 to the Consolidated Financial Statements for the year ended 31 December 2012).

With respect to PWR reactors, provisions were made for all 58 operational units, on the basis of an estimated amount of €<sub>2012</sub>303 per installed kW. This amount covers the decommissioning operations, excluding management of waste from decommissioning.

The detailed decommissioning cost estimate prepared in 1999 using the representative example of the Dampierre site was updated by EDF in 2009 to take into account the feedback of the dismantling operations carried out by EDF on its first-generation plants and Level 3 decommissioning operations (full dismantling and removal of the reactor building, materials and equipment that is still radioactive) carried out by other operators, mainly US operators. When this update took place, an analytical approach verified that the decommissioning costs per installed kW for the four 900MW units at the Dampierre site could indeed be extended to the entire PWR fleet and the provisions made for the decommissioning of the 58 operational units did not need to be reviewed either upwards or downwards.

As part of the update of this Dampierre study in 2009, EDF commissioned an intercomparison study from the La Guardia firm based specifically on the Maine Yankee reactor. The results showed firstly that the estimates made by La Guardia and by EDF were very similar, and secondly that any intercomparison exercise requires in-depth checking of the scope and assumptions considered. In particular, it is advisable to take account of the specific requirements laid down in each country, the level of standardisation and homogeneity of the fleet, the subsidiary, the number of units per site, any industrial re-use of the site, and so on. As sole owner, operator, architect and assembler, EDF benefits from knowledge of its power plants and the expertise of a specialist engineering body in this field.

Furthermore, an international comparison conducted by the OECD in late 2003 showed that EDF's estimates are consistent with the estimates made by other countries. With the exception of a few specific cases (Sweden, Japan), the costs advanced by each party are actually fairly similar, with France at 10% to 15% below the average, mainly explained by the series effect that can be reasonably expected from the decommissioning of the PWR fleet.

1. Pursuant to the same agreement, the CEA has become fully responsible for the decommissioning of Phénix.

An agreement was reached in 2011 between the CEA, EDF, AREVA and the French department for Energy and Climate ("DGE") following the request made by the DGE that audits should be made on assessment tools used for end-of-cycle commitments concerning EDF, AREVA and the CEA. The audits to be carried out fall under the law of 28 June 2006 relating to the sustainable management of radioactive waste and materials and the decree of 23 February 2007 on secure financing for nuclear charges.

### Third-party installations: La Hague (AREVA) and Phénix (CEA)

As the responsibility for the decommissioning of facilities is incumbent on their operator, EDF wished to free itself financially from these operations.

Similarly, the agreements signed with AREVA in July 2010 and the CEA in late 2008 clarified the financial responsibilities of both parties. Following a cash payment, EDF was released from any obligation for the decommissioning of the Phénix power plant, which has been shut down, and La Hague power plant.

#### 6.2.1.1.3.7 Assets available to cover long-term nuclear-related commitments (outside the operating cycle)

Dedicated assets have been gradually built up since 1999 to cover long-term nuclear commitments.

The law of 28 June 2006 and its implementing regulations identified provisions that are not associated with the operating cycle and must therefore be covered by dedicated assets (see section 20.1 ("Historical financial information"), note 48.5 to the consolidated financial statements for the year ended 31 December 2012).

For EDF, these provisions relate to:

- decommissioning of nuclear power plants (€12.6 billion as at 31 December 2012);
- the long-term management of radioactive waste (€7.1 billion as at 31 December 2012);
- the part of the provision for the last cores on future long-term management costs for radioactive waste (€434 million at 31 December 2012).

The provision for management of used fuel and the share of the provision for last cores relative to the cost of non-irradiated fuel are part of the operating cycle and are therefore excluded from the asset base for coverage.

The law of 28 June 2006 had set a deadline of five years so that the portfolio value of the dedicated assets is at least equal to the value of provisions,

i.e., no later than June 2011. The NOME law of 7 December 2010 granted operators an exemption extension of five years for complete coverage of liabilities by assets, or no later than June 2016, if the operator meets the conditions prescribed by law, which is true of EDF. The provisional program of annual allocations was established to meet the target set by law.

For 2012, the cash allocation to EDF's dedicated asset portfolio totalled €737 million. At 31 December 2012, dedicated assets represented a realisable value of €17.6 billion (including €15.2 billion for the financial portfolio of shares, bonds and cash, and €2.4 billion for RTE securities assigned to the dedicated assets) compared with €20.1 billion in provisions (see section 20.1 ("Historical financial information"), note 48.3 to the consolidated financial statements for the year ended 31 December 2012).

On 8 February 2013, after closing, the French State granted in compliance with the decree of 23 February 2007 the authorisation to allocate the CSPE receivable to the dedicated assets. Following this authorisation, the Group decided to allocate the entire receivable representing the cumulative CSPE as of end 2012 totalling about €4.9 billion. Accordingly, EDF was able to subtract around €2.4 billion in financial assets from its dedicated assets portfolio resulting in a net allocation of €2.5 billion Euros and thus reaching a 100% coverage ratio of the long-term nuclear-related commitments, ahead of the 30 June 2016 deadline set out in law (see section 20.1 ("Historical financial information"), note 51.3 to the consolidated financial statements for the year ended 31 December 2012).

#### 6.2.1.1.4 Hydropower generation

The electricity generated by EDF from its fleet of nuclear power plants represented, as at 31 December 2012, 7.6% of its total electricity generation net of pumping.

##### 6.2.1.1.4.1 EDF's fleet of hydropower generation facilities

EDF's hydraulic fleet in mainland France comprises 435 power plants:

- approximately 11% of plants have unit power of over 100MW; they represent 61% of total power generation;
- around 50% of plants have a unitary power of less than 12MW and represent less than 7% of total production.

The average age of the fleet 68 years.

The table below summarises the maximum power of the hydropower plants, as well as their net generation and consumption by pumping operations for the last three years, according to whether their capacity is more or less than 12MW.

	31/12/2010	31/12/2011	31/12/2012
<b>Hydropower plants with capacity lower than or equal to 12MW</b>			
Maximum capacity (MW)	1,011.5	996.2	996.2
Net pumping generation (TWh)	3.1	2.2	2.6
Consumption by pumping operations (GWh)	40.0	16.1	40.3
Generation including pumping (TWh)	3.1	2.2	2.6
<b>Hydropower plants with capacity greater than 12MW</b>			
Maximum capacity (MW)	19,011.1	19,011.1	19,013.3
Net pumping generation (TWh)	35.7	24.6	32.0
Consumption by pumping operations (GWh)	6.6	6.9	6.7
Generation including pumping (TWh)	42.3	31.5	38.6
<b>TOTAL MAXIMUM CAPACITY (GW)</b>	<b>20.0</b>	<b>20.0</b>	<b>20.0</b>
<b>TOTAL NET PUMPING GENERATION (TWH)</b>	<b>38.8</b>	<b>26.8</b>	<b>34.5</b>
<b>TOTAL GENERATION INCLUDING PUMPING (TWH)<sup>(1)</sup></b>	<b>45.4</b>	<b>33.7</b>	<b>41.2</b>

1. Including tidal power plant on Rance river (503 GWh).

In terms of mainland France, the power plants are mainly located in mountainous areas in the Pyrenees, the Alps, the Massif central and the Jura, as well as on the Rhine. In all, they represent an installed capacity of approximately 20GW (excluding French overseas departments and Corsica), or 20% of EDF's fleet, for an annual generation capability (i.e., for average hydraulicity, see glossary) of approximately 43.5TWh, which makes France the second-largest generator of renewable electricity in the European Union.

The various hydropower infrastructures were designed to optimise the uses of water resources in the valleys. As a result of the size and variety of its fleet, EDF has systems that are capable of responding to all types of demand, whether base load or peak, and that offer optimisation leverages due to their flexibility of use: "run-of-river" infrastructures, like over the

Rhine, which do not have storage capacity and produce energy according to the water supply at that moment; pondage power stations with a medium-sized water reserve (smaller than a lake), for occasional use during the week or day, to cover demand peaks; lakes infrastructures (seasonal reservoirs) located in the mountains (Alps, Pyrenees and Massif Central); energy transfer pumping stations ("STEP"), which make it possible to pump water from the basin downstream to the upstream basin in low-price periods, to form a reserve that will be used to produce energy at peak periods (the water is then "turbiné" from the upstream basin to the downstream basin), a tidal power plant on the Rance that, by using the up and down movement of the tides, provides electricity in a very regular manner.

Category	Power	Average generation capability over 50 years
Run-of-river	3.6GW	17.1TWh
Lake	8.8GW	15.8TWh
Pondage	3.1GW	8.8TWh
Tidal	240MW	0.5TWh

The EDF energy transfer pumping stations in mainland France represent a capacity of 4.3GW for a generated quantity in 2012 of 4.6TWh. The generated capacity of STEPs related to upstream contributions in the upstream basins is 1.1TWh on average.

#### 6.2.1.1.4.2 Hydropower safety

Hydropower safety comprises all the provisions made when designing and operating hydropower systems and to ensure the protection of people and goods against the dangers associated with water and due to the presence or operation of facilities. Hydropower safety is the main, ongoing concern of the producer (see section 4.2.2.2 "Management of hydropower safety risk"). It involves three main activities:

- control of operating risks: variations in levels of water bodies or flow rates downstream of facilities;
- management of operations during flood periods, in order to ensure safety with respect to facilities and inhabitants;
- the prevention of a major risk, such as the breach of a dam, by means of monitoring and maintenance of installations under the supervision of public authorities, mainly the French regional environment, land use and housing authorities (*Directions Régionales de l'Environnement, de l'Aménagement et du Logement*, or "DREAL"). Among the most important dams, 68 are subject to a specific administrative procedure (*Plan Particulier d'Intervention*) implemented by the relevant prefect.

EDF performs regular monitoring and maintenance of its dams, including continuous testing. Real-time analysis and reports for each site with several parameters (settlement, pressure and outflow measures associated with a visual inspection of concrete and the control of mechanical parts) enable EDF to regularly prepare reports on the condition of its dams. Thanks to a series of sensors, EDF's teams in Grenoble and Toulouse can analyse the most important or the least accessible dams remotely and, if necessary, in real time.

In addition, a comprehensive check-up of each of the 150 largest dams is carried out every ten years, as well as a drain down or a structure inspection using underwater equipment. These operations are carried out under the supervision of public authorities (DREAL and STEEG – *Service Technique de l'Énergie Électrique et des Grands Barrages*, or Electrical Power and Large Dams Technical Service). In 2012, EDF carried out 19 complete check-ups at its sites.

At an organisational level, the hydropower safety inspector, who reports directly to the Chairman and CEO of EDF, drafts a report each year intended for the EDF Chairman and hydropower safety partners. The aim of this report, after analyses, inspections and assessments performed by the Hydropower

Safety Inspector, is to give an opinion on the level of hydropower safety of the Group's facilities, and to provide areas for thought and development, so as to ensure improvement and consolidation. This report is published on the Group's website. Hydropower safety is an absolute priority for hydropower generation, and has been the catalyst for the substantial development in operating practices and policies adopted over the last few years. It is a determining factor in influencing decisions relating to the maintenance of EDF's assets.

#### 6.2.1.1.4.3 Performance of the hydropower generation fleet

##### A highly automated fleet

In order to take advantage of the flexibility of its hydropower generation facilities, for some years now, EDF has been initiating ambitious programmes involving automation, remote control of hydropower plants and centralised management of the valleys. Currently, the largest plants in EDF's hydropower fleet, representing over 15GW and over 75% of its installed hydropower capacity are remote-controlled from four control centres capable of changing their operating programme at any time in order to respond to the needs of the electrical system and to economic opportunities arising on the electricity market.

##### Technical performance of the fleet and hydropower conditions 2012

Hydropower generation may witness substantial variations from one year to the next, depending on climatic fluctuations in water resources. In comparison with 2011, an atypical year when hydrological conditions were severely affected in many basins, 2012 marks a return to almost normal conditions.

Hydropower electricity generation before the deduction of the power needed to operate pumped storage plants was 41.2TWh in mainland France and 34.5TWh in net terms.

The overall availability of the hydropower fleet, i.e., the percentage of time over the year during which the power plant is available at full power, was approximately 82.1% in 2012, about the same compared with 2011. The unavailability of EDF's hydropower fleet resulted from facility maintenance (13.9%, planned maintenance) and unplanned outages due to the extension of maintenance works and contingencies (4%). The demand response rate, i.e., the rate of success in responding to start-up orders received by the power plants, has been over 99% for several years in a context of an increasing number of orders for hydropower generation sites.

Continuing the procedure initiated in 2005 for identifying risks of faults by material type and in a context marked by some instances of faults leading to the medium-term unavailability of installations (Tuilères dam in Dordogne, etc.), EDF decided, in 2006, to implement a programme to upgrade the technical standard and strengthen site maintenance in order to renovate certain installations, to maintain a lasting high level of hydro- power safety, and to preserve the long-term technical performances of its fleet. The total budget to renovate the facilities was reassessed to take into account the breadth of work, and now stands at around €900 million for the 2007-2015 period, of which €800 million is dedicated to the safety of facilities. This renovation programme for hydropower facilities, known in French as “*Sûreté et Performance de l’Hydraulique*” (Hydropower Safety and Performance), or “*SuPerHydro*” will, temporarily while the work is ongoing, entail longer programmed outages (resulting in a drop in overall availability of several points) than those recorded in recent years. However, implementing the programme has no impact on unplanned outages in the hydropower fleet, with the rate of unplanned outages due to equipment failure and the demand response rate both remaining at good levels.

In 2011, after development of pilot programmes, EDF also began another ambitious modernisation project in terms of the industrial performance of its hydropower fleet, at an overall cost of €840 million over the period 2009-2021. This project, known as “*RenouvEau*”, aims to modernise the maintenance and operation of the hydropower fleet, specifically via the renovation of electrical facilities, control monitoring and computerised management, maintenance and operating tools. Thanks to modernised and standardised maintenance and operating practices (e-operating, e-monitoring, computer-aided maintenance management, etc.) to improve the operating performance of the hydropower fleet, in particular its generation capacity, its availability and its contribution to system services.

#### 6.2.1.1.4.4 Issues relating to hydropower generation

The hydropower fleet faces the following issues: renewal of concessions, managing access to water and development.

##### Concessions renewal

Hydropower generation facilities are operated through concessions granted by decree, for facilities exceeding 100MW, or by the prefect, for facilities whose capacity is between 4.5MW and 100MW; and permits granted by the prefecture for facilities of less than 4.5MW.

EDF currently holds the majority of the hydropower concessions in France.

The concessions had an initial term of 75 years, pursuant to the French law of 16 October 1919, with respect to hydropower, and are in general renewed for terms of 30 to 50 years. The renewal of these concessions provides an opportunity to update the specifications in order to incorporate new requirements for water resource management and to take into account the provisions set forth in the latest specifications annexed to decree No. 99-872 dated 11 October 1999, as amended by decree No. 2008-1009 dated 26 September 2008.

The decree of 22 February 2012 approved the agreement and specifications of the concession by the State to EDF for the operation of the Eguzon and Roche au Moine concessions, representing a gross cumulative maximum power of 109MW. However, both associations have submitted an application to the Council of State for annulment of the decree. Renewal of hydropower concessions in France is done pursuant to the Sapin law (1993).

On 22 April 2010, the government announced the scope of the concessions that will be renewed through a call to tender. Ten concessions with total power of 5,300MW, representing some 20% of the French hydropower fleet, will thus be renewed (including 200MW of requested surplus capacity). The government wishes the early termination of 13 concessions, including 12 held by EDF, in order to create groupings by valley.

In all, the concessions held by EDF and affected by these renewals represent licensed capacity of about 4,300MW and an average production of nearly 7TWh per year, or 15% of EDF's hydropower generation, of which almost half with early termination (about 2,150MW and 3.5TWh).

Between 2015 and 2025, approximately another 1,000MW and 3TWh will expire.

Given the complexity of the procedure, the French government obtained support in the technical, legal, financial and scheduling areas.

Under current regulations, the former concession holder does not receive any compensation if an expiring concession is not renewed after it is commissioned. Upon expiration of the concession, all of the state-owned installations (from the dam to the turbine) must be in “good working condition and maintenance”. The amended finance law for 2006 provides for the reimbursement of unamortised expenses related to modernisation works or to works that permit the expansion of the generation capacity, provided that these works were made during the second half of the concession.

However, the concessions whose term is anticipated by the French government will be compensated. This compensation from the government is intended to offset the shortfall for the outgoing operator due to the early termination of the operation of the concession, under the provisions of the concessions specifications.

At the time a hydropower concession is renewed, an annual concession fee indexed on the revenues generated from sales of electricity produced by the hydropower facilities under concession is levied. It is paid to the French government and allocated in part to the French administrative départements where the waterways used flow. The Grenelle 2 law of 12 July 2010 provides that the fee shall not exceed a limit set on a case-by-case basis by the licensing authority as part of the process.

Decree No. 2008-1009 dated 26 September 2008 sets the rules and procedures for a hydropower concession request in a competitive market. It sets three criteria for the choice of the future concession holder: (i) a guarantee on the energy efficiency in the operation of the waterfall; (ii) respect for balanced management of water resources; and (iii) the best economic and financial conditions for the contracting authority. The new procedure for the designation of a concessionaire will now have a duration of five years (against 11 years currently <sup>1</sup>).

EDF is preparing to submit its best offer for each concession, combining improved energy efficiency, attention to aquatic environments, compensation of the government and municipalities through fees and land development, while ensuring the safety and security of the operation. To succeed, EDF is relying on its full expertise in operations and engineering as well as in the field of environmental protection.

Following the proposal of the President of the French National Assembly's Committee on Economic Affairs in November 2012, a fact-finding parliamentary mission was created to study hydropower dams. The Rapporteur of this mission is expected to release his findings in the first quarter of 2013.

##### Managing access to water

The 239 dams-reservoirs operated by EDF in France enable the storage of 7.5 billion cubic meters of water, i.e. 75% of national surface storage reserves.

The hydropower installations have positive effects on both economic development and the environment, and EDF has a proactive management policy in relation to its hydropower resource, which it enforces in cooperation with various water stakeholders. EDF has entered into agreements with local elected officials, farmers, fishermen, managers of tourist sites and manufacturers.

1. These durations cover the full length of the open competition process to designate a concessionary, from the call for tender to the designation of the selected candidate.



EDF gives preference to consultation with local users. This process aims first at measuring the real effects of hydropower operations on the environment and on other uses, before attempting to minimise these effects when technically possible and financially reasonable.

As a result, 700 million cubic meters of water can be released each year from the dams according to needs, to satisfy uses other than the electricity generation (drinking water supplies, to supplement periods of low flow, irrigation, production of artificial snow, water sports, etc.).

The law of 30 December 2006 concerning water and aquatic environments contains provisions relating to the management of water resources (in particular, the value of reserved flows<sup>1</sup> and the flexibility of hydropower plant operations). EDF estimates that these provisions will have medium-term consequences for its hydropower activities (see section 6.5 ("Legislative and regulatory environment")).

Generally speaking, since the start-up of the first generation facilities, EDF has endeavoured to better understand the impact of its generation activities on the environment, especially in terms of biodiversity (see section 6.6.7 ("Helping to preserve biodiversity")). In 2011, this desire became reality with the signing of a partnership with the National Office of Water and Aquatic Environments (ONEMA) for the protection and restoration of aquatic environments. This framework agreement lasting four years covers several issues associated with managing water resources, managing aquatic species, the dynamic of rivers and socio-economic aspects. This agreement was complemented by a specific research and development section on the response of aquatic ecosystems to the presence and operating methods used by electricity generation facilities.

The dam reconfiguration project at Poutès sur l'Allier, approved by the French government on 6 October 2011, is also part of this strategy. The result of dialogue between elected representatives and associations, under the aegis of the public authorities, this new-look dam will combine environmental performance and electricity generation using renewable electricity. The innovative project designed by EDF's hydraulic engineering division will see the dam reduced from 17 to 4 metres in height, making it easier for migrating fish to pass it, with only a 10% impact on the dam's maximum output and generation capacity.

## Development

95% of France's hydropower capacity is currently being operated. EDF is nevertheless continuing the development of its hydropower activities, through the study and realisation of new projects.

- In Alsace, EDF has been involved in a hydropower energy development plan since 2008 for a total capacity of 130MW and for an amount of €225 million:
  - in 2008, EDF commissioned the Brisach hydropower micro-plant, with capacity of 2.7MW; during the inauguration of this plant, EDF announced its development plan in Alsace;
  - in 2009, EDF participated in the commissioning of the Kehl micro-power plant on the German side of the Rhine, with a capacity of 1.4MW. A similar project is in progress close to the Kembs dam, for a capacity of 8MW and a generation capability of 28GWh, with commissioning planned for 2015;
  - EDF is studying the reinforcement of the Gambsheim hydropower plant by the installation of an additional 28MW generator set. A similar operation is in progress on the Iffezheim dam in Germany, with the installation of an additional 38MW generator set on the German side of the Rhine, to be commissioned in spring 2013;

- in the Vosges mountains, under a new concession awarded on 20 April 2009, the old pump storage hydropower station at lac Noir should be replaced after 2016 by a modern plant with a capacity of 55MW;
- measures for the preservation of water resources and biodiversity will be implemented, notably with the realisation of fish passes at Strasbourg, where turbines will be placed in the water flow<sup>2</sup>, and Kembs.
- EDF is planning to operate a tidal turbine farm demonstration unit on the Paimpol-Brehat site in the Côtes d'Armor. This demonstration unit, the first of its kind, will eventually comprise four tidal turbines. The aim of this 2MW project is to test the principle of energy production from tidal currents under real conditions (see section 6.4.1.2.1 ("Description of new energies")). The first tidal phase undergoing tests and technical adjustments.
- Generation from reserved flows will continue to be developed. The purpose is to equip a certain number of dams in order to process the reserve flow through the turbines and recover a portion of the associated energy. In 2012, a project was commissioned for a capacity of 1.1MW and energy generation of 6.7GWh. Projects are under consideration or in progress for total capacity of some 21MW and energy generation in the region of 126GWh, with expected commissioning dates ranging from 2013 to 2017.

In addition, EDF's objective is to use all available opportunities for expansion, including:

- developing "small hydro" (power plants below 12MW): two small facility projects are in progress (Échirolles and Rabuons) for a capacity of 6.3MW and energy generation of 26GWh. They will be commissioned between 2014 and 2018. SHEMA, a fully-owned subsidiary of the EDF Group via Edev, and its subsidiaries, specialise in managing and operating small hydropower construction projects and to this end have a fleet of 83 power plants. One of their aims is to develop small-scale hydropower by:
  - optimising and increasing the generation capacity of the existing fleet (renovation of 16 power plants in the Mayenne region, renovation programme for power plants in the Var, Lot and Dordogne regions),
  - acquiring small hydropower facilities in France (two power plants purchased in 2012 for 1.2MW and 4.2GWh),
  - building new small-scale hydropower facilities (Palisse power plant under construction in the Cantal region for 2.6MW and projects under consideration),
- implementing partnerships for project development;
- optimisation of the potential of pumped storage plants in France: as part of a project of the European Commission, EDF initiated a project to transform one of the groups of the Le Cheylas STEP so that it works at variable speeds;
- look into the possibilities for "surplus production" (for instance, by increasing the capacity of existing hydropower plants) specifically detailed in the law of 13 July 2005 (the "POPE" law) setting out guidelines for energy policy (see section 6.5.3.2 ("French legislation: Energy Code")) to contribute to the development of peak processes. Following the decree of 31 May 2011, EDF is adapting existing groups of the La Bathie power plant in Savoy to increase by 45MW the power available on the network. Similarly, a decree of 18 December 2011 authorises EDF to increase by about 55MW power of the Serre-Ponçon concession. Other projects to allow EDF to benefit from the provisions of the POPE law are under consideration, specifically in terms of the energy transfer pumping station at La Coche;

1. Minimum flow maintained downstream of dams to protect aquatic life.

2. Water flow rate to attract fish to crossings.



# 6 | Overview of activities

## Presentation of EDF group's business in France

- to take the opportunity during facilities upgrades to increase their capacities. Accordingly, in 2010 EDF took the opportunity during a major renovation of the energy transfer pumping station at Revin to improve the facility's performance (increase of energy produced of about 20% for a pumped storage plant with a maximum capacity of 808MW);
- upgrading existing facilities (modernisation, optimising generation, etc.) as part of concession renewals. Accordingly, in the context of renewing the Moyenne Romanche concession and decrees published on 31 December 2010, EDF has begun work to replace 6 small existing plants with the construction of a new subterranean power plant (Romanche-Gavet power plant) with a capacity of 93MW and energy generation of 560GWh or 155GWh more than existing power plants.

These hydropower development projects by the EDF Group in mainland France are fully consistent with the policies of the Grenelle environmental action plan.

EDF has also strengthened its support for territorial development projects. This support was formalised in 2012 with the inauguration of the agency "one river, a territory" in the valleys of the Lot, Tarn and Truyère. As a crossroads for project developers seeking expertise, the agency allows EDF to participate in regional economic development by promoting innovative projects involving local providers.

### 6.2.1.1.5.1 EDF's fleet of fossil-fuel fired generation facilities

As at 31 December 2012, the fossil-fuel fired generation facilities operated by EDF are of different types, both in terms of fuel and power<sup>1</sup>:

Fuel	Unit capacity (MW)	Number of units in operation as of 2012	Total capacity (MW)	Year Commissioned	Energy produced over the past three years (TWh)		
					31/12/2010	31/12/2011	31/12/2012
Coal	250	9	2,250	from 1966 to 1971			
	585	1	585	1969	14.5	10.9	12.7
	580	3	1,740	in 1983 and 1984			
Fuel oil*	585	4	2,340	from 1968 to 1975	2.1	0.4	0.8
	685	4	2,740	in 1976 and 1977			
	85	4	340	in 1980 and 1981			
Fuel oil fired/Dual and Dual	203	1	203	in 1992			
	134	1	134	in 1996			
					0.3	0.1	0.2
Dual	125-129	2	254	in 1997 and 2007			
	187	2	374	in 2008			
	185-187	3	557	in 2009 and 2010			
Combined-cycle gas turbines	427	1	427	2011		0.4	1.2
	465	1	465	2012			

\* 250MW fuel units are closed.

The installed capacity of the fossil-fuel thermal fleet in operation in mainland France stands at 12,409MW, including the Blenod combined cycle gas plant commissioned in 2011 and the first of two combined cycles in Martigues, which was commissioned in 2012. These are EDF's first combined cycle gas plants in France and they complement the investments made in combustion turbines, very reactive extreme peak resources<sup>2</sup> that were recently commissioned in Vitry (Arrighi), Vaires-sur-Marne and Montereau.

### 6.2.1.1.5 Fossil-fuel fired generation

EDF's electricity production from its fossil-fuel fired power plants in continental France represented approximately 3.3% of its total electricity production in 2012. This fleet, which has an average age of approximately 28 years, had a total installed functioning capacity of 12,409MW (for a total installed capacity of 14,734MW).

Fossil-fuel fired generation methods have a certain number of advantages: a high degree of reactivity and flexibility (quick start-up and power modulation); the ability to be shut down for extended periods (stand-by), or conversely to be brought back into operation within short periods of time; and investment costs which are lower than for nuclear or hydropower facilities, and shorter construction periods.

Furthermore, the most modern fossil-fuel fired plants meet the environmental requirements of the latest directives in force.

Fossil-fuel fired generation methods are one of the essential components of the energy mix to ensure the balance of production-consumption in real time and to accommodate the fluctuations in electricity consumption. Together with some hydropower facilities (lakes, pumped storage plants), the fossil-fuel fired generation methods are used to cover mid-merit and peak demand electricity requirements. For this reason, they play an important role in adjusting EDF's generation capacities in response to the changes of its customers' consumption (or demand).

Furthermore, the two Montereau combustion turbines can operate using natural gas or domestic oil, further improving their flexibility.

With a fuel-fired reserve which stood at the end of 2012 at 2,325MW, the total installed capacity of the EDF fossil-fuel fired generation fleet in mainland France amounts to 14,734MW.

1. This table takes into account the shutdown of two of the three fuel oil-fired units in Martigues (See 6.2.1.1.5.2 "Issues relating to fossil-fuel fired generation").

2. "Extreme peak" designates plants running fewer than 200 hours per year.

#### 6.2.1.1.5.2 Issues relating to fossil-fuel fired generation

##### **Updating of the most recent coal-fired production means to meet mid-merit load capacity demand**

For mid-merit load capacity, maintaining the most recent (i.e. most efficient) coal-fired units is the best solution to ensure availability of competitive capacities.

In particular, the most recent 600MW coal-fired units benefit from the lowest fuel generation costs of all of the fossil-fuel fired generation facilities (better efficiency, seaside units, and large capacity sites). Their power, along with the flexibility of their generation, are essential advantages. They are equipped with a gas flow desulphuration system (90% reduction in sulphur dioxide emissions) and a smoke denitrification system (80% reduction in nitrogen oxide emissions). These processes mean that the units comply with environmental restrictions applicable since 2008, as well as meeting tighter regulations to be implemented from 2015. A renovation programme for these coal-fired units is currently in progress, with the aim of improving their reliability and the extension of their operating life by 2035.

However, because of restrictions in environmental regulations, EDF plans to shut its nine 250MW coal-fired units along with Le Havre 2 unit by 31 December 2015. For these units, maintenance programmes have been drawn up taking their forthcoming shutdown into account.

Due to technical damage in March 2013, the 250MW coal-fired Unit 1 in Le Havre stopped on 8 March 2013, after EDF decided to anticipate from some months the shut-down of this unit.

##### **Strengthening of combustion turbine fleet and renovation of oil fleet to contribute to meeting peak needs**

Since 2007, EDF has commissioned 1,060MW in extreme peak capacity via combustion turbines on its sites in Vitry-Arrighi, Vaires-sur-Marne and Montereau. These highly responsive facilities are mobilised during periods of high electricity consumption.

Furthermore, EDF decided to equip two oil-fired units with low NO<sub>x</sub> burners, to enable them to operate until 2023, complying with the environmental regulations applicable from 2016.

##### **Modernisation of the fossil-fuel thermal generation fleet with combined cycles**

After the commissioning in 2011 of a first combined cycle gas plant in France on the Blénod site, EDF commissioned a second combined cycle gas plant on 31 August 2012 in Martigues. This unit is the result of the repowering of former fuel units a part of whose facilities, such as the steam turbine, the condenser, and the water treatment facilities, were reused. The repowering of a unit of this power is a first in Europe. Its installed capacity is 465MW and its efficiency is over 50% higher than that of conventional thermal units. The second combined cycle plant in Martigues will be commissioned in the first half of 2013, bringing the total installed capacity of the plant from 465 to 930MW.

These renovation and modernisation projects of the fossil-fuel fired generation fleet will enable EDF to reduce atmospheric emissions of CO<sub>2</sub>, nitrogen oxides, and sulphur oxide. Moreover, the oil-fired units now use fuel at "Ultra low sulphur content" (oil known as "ULSD" with 0.55% sulphur content).

In addition to the finalising of the Martigues repowering project, in December 2011, EDF decided to commit to the joint development with General Electric of a new generation combined cycle gas plant, fitted with FlexEfficiency50 technology. This joint development will provide an opportunity to operate a combined cycle plant with innovative characteristics in terms of capacity, with 510MW achievable in less than 30 minutes, and output (61% versus an average output for a standard CCGT plant of 57-58%), while providing good environmental performance, with CO<sub>2</sub> emissions on average 10% less than those for a standard CCGT plant. At this stage

of project, commissioning is scheduled for late 2015 on the Bouchain site in northern France.

Lastly, concerning CCS technology (Carbon Dioxide Capture and Storage), the EDF Group is participating in post-combustion and oxy-combustion capture projects with industrial partners as well as in studies concerning the transmission and storage of CO<sub>2</sub>. A CO<sub>2</sub> capture demonstration is thus under construction at Le Havre site. This project, a 25% stake of which is financed by the Demonstrator Fund coordinated by ADEME, is spearheaded in partnership with Alstom and Veolia Environnement. This demonstrator will enable tests to be performed on the impact of post-combustion amine capture (a chemical process that consists of trapping CO<sub>2</sub> using an ammonia-based compound) on CO<sub>2</sub> found in smoke coming from the combustion of coal, as well checking the impact of this technology in an industrial setting, and analysing its flexibility during operation. The project was committed to for 2010-2013 with rollout scheduled over three stages: study, construction and operation. Commissioning of unit 1 scheduled for 2013.

##### **Evolution of the environmental regulatory framework**

Fossil-fuel thermal power plants are operated now within the context of regulations that apply to installations classified for environmental protection purposes ("*installations classées pour la protection de l'environnement*", or "ICPE"), as well as regulations relating to greenhouse gas emissions and a specific regulation for air quality (see section 6.5.6.1 ("*Basic regulations applicable to the environment, health, hygiene and safety*"))).

The regulations relating to greenhouse gas emissions led to the establishment, in 2005, of the national CO<sub>2</sub> quota allocation plan. During the first period (2005-2007), these quotas covered the actual CO<sub>2</sub> emissions of the fossil-fuel fired fleet. In line with the national CO<sub>2</sub> quota plan for the period 2008-2012, EDF (mainland France) received 14.4 million tonnes of quotas for its power plants in mainland France in respect of 2012<sup>1</sup>. At the same time, total emissions of the EDF fleet in mainland France rose to 13.3 million tonnes<sup>2</sup>. Furthermore, in accordance with European regulations, electricity companies must pay the full CO<sub>2</sub> quotas corresponding to their greenhouse gas emissions beginning in January 2013.

The adaptation of its fossil-fuel fired generation facilities undertaken by EDF is a result of the obligations imposed by regulations on air quality and the reduction of emissions of airborne pollutants, which have targets to be met by 2015. The tightening of this regulation for 2015 is an important challenge for EDF, particularly with regards to the operation of its fuel oil units beyond this date.

Thanks to the shutdown of the oldest fossil-fuel thermal power plants, updating of the most recent plants, set up of pollution-reducing procedures and the use of low sulphur fuel, EDF has set a target to reduce by 30% its emissions of CO<sub>2</sub> (measured in tonnes) between 1990 and 2020 and to reduce by 50% its emissions of SO<sub>x</sub>, NO<sub>x</sub> and dust between 2005 and 2020 (see section 6.5 ("*Legislative and regulatory environment*")).

##### **Generation and technical performance**

Fossil-fuel fired generation represented 14.9TWh in 2012, an increase of over 25% compared with 2011. It represents 3.3% of EDF's annual generation in mainland France.

Fossil-fuel fired generation was impacted by the fire that broke out in the engine room of the Le Havre site on 30 January 2012. This fire caused an unavailability of about a month for two of the units, and of eight and a half months for the third, which was the most affected by the disaster. At the end of 2012, the three units in Le Havre were back in operation.

The reliability of the fossil-fuel fired generation fleet was confirmed in 2012, standing at the same level as European standards. A marked improvement was seen in the ability of oil-based units and CTs to respond to calls from the optimiser. Minimising unplanned outages is the essential aim for generation means such as fossil-fuel fired facilities, operating at mid-merit and peak.

1. CO<sub>2</sub> emissions from the EDF fleet for 2012 may change slightly, according to the latest breakdowns.

2. Within the scope of EDF SA (including SEI), total emissions amounted to 16.4 million tons in 2012.

The goal for these generation methods, that are called upon throughout the year on a variable basis (EDF's fossil-fuel fired power plants operate annually between 1,500 and 6,000 hours for coal, 200 and 1,500 for oil, and several hundreds of hours for combustion turbines) is to ensure the system's security through maximum levels of reliability and availability.

## The decommissioning of the existing fleet

EDF has planned all of the decommissioning operations for its existing fossil-fuel fired generation facilities. The provisions for these operations have been made in an amount that corresponds to the cost of decommissioning all of the units being operated and the cleanup of the sites (see section 20.1 ("Historical financial information") note 30 to the consolidated financial statements for the year ended 31 December 2012).

In 2012, EDF continued the decommissioning work on sites that have been permanently shut down.

## 6.2.1.2 Sales and marketing

### 6.2.1.2.1 Presentation of the market in France

#### 6.2.1.2.1.1 Demand

Domestic consumption in France, including Corsica, during the 2012 fiscal year stood at 489.5TWh<sup>1</sup>, up 2.1% from 2011. However, after adjustment for the weather factor and leap year effect, it is stable.

2012 domestic gas consumption amounted to 461TWh<sup>2</sup>, a 3.2% increase on 2011.

#### 6.2.1.2.1.2 Competition

Since 1 July 2007, the French market has been fully open for electricity sales. All customers are free to choose their energy providers. They may choose at any time without notice to take up an EDF market price offer or an offer made by an EDF competitor.

Among electricity suppliers on the French market, EDF's main competitors are GDF Suez, E.ON (SNET), Enel and Poweo Direct Énergie. The merger on 11 July 2012 of Direct Énergie and Poweo gave birth to a group that holds a portfolio of over 1 million residential and business customers<sup>3</sup>. E.ON (SNET) and Enel do not compete in the residential customer market.

The main competitor, GDF Suez, with over 11 million gas and electricity customers in mainland France is the leading gas supplier<sup>4</sup>. The other gas suppliers on the corporate and local authority customer segment are Tegaz, Eni, Gaz Natural, Gazprom, E.ON and Antargaz. On the residential customer segment, Poweo Direct Énergie and Eni are the largest suppliers.

As at 31 December 2012, according to the CRE, the electricity market shares of alternative suppliers, i.e. excluding historical suppliers, were 6.9% on residential sites and 7.6% on non-residential sites, while their gas market shares on residential and non-residential sites were 11.3% and 22.8%, respectively.

The NOME law enacted on 7 December 2010 lays down the rules on competition in electricity and gas sales. The main provisions of the law are as follows:

- regulated electricity and gas tariffs are now covered by provisions described in section 6.2.1.2.1.3 ("Regulated sales tariff contracts");

- the transitory tariff for market adjustment (*Tarif Réglementé Transitoire d'Ajustement au Marché*, or "TaRTAM") ended on 30 June 2011, when the ARENH programme entered into force;
- ARENH, implemented under the NOME law, was introduced on 1 July 2011 for the benefit of EDF's competing suppliers. This system allows competitors to supply their end customers located in mainland France through EDF after the signing of a framework agreement. The primary ARENH allocation mechanism is described in section 6.2.1.3.6 (Regulated access to electricity from the existing nuclear fleet ("ARENH")).

Some thirty electricity suppliers signed a framework agreement with EDF. The half-yearly volumes made available were stable at around 30TWh.

In order to supply their clients, in 2012 EDF Group competitive suppliers had access to:

- their own generation capacities;
- 60.8TWh associated with regulated access to electricity from the existing nuclear fleet (see section 6.2.1.3.6 ("Regulated access to electricity from the existing nuclear fleet ("ARENH")"));
- 27.6TWh<sup>5</sup> made available in 2012 by the EDF Group through "Capacity Auctions" (VPP) described in section 6.2.1.3.3 ("Capacity auctions");
- 5.8TWh made available since 2008 by the EDF Group through "Supplier Calls for Tender" (SCT) following the ruling on 10 December 2007 of the Competition Authority (see section 6.2.1.3.4 ("Supplying electricity to alternative suppliers in France"));
- imports;
- the wholesale electricity market.

#### 6.2.1.2.1.3 Regulated sales tariff contracts

##### Access to regulated electricity and natural gas tariffs

The principles defining rights to tariffs are described in the NOME law of 7 December 2010 and are listed in Articles L. 337-7 to L. 337-9 and Article L. 445-5 of the French Energy Code.

Since the NOME law entered into force, the situation (by energy source and customer category) is as follows:

- Electricity:
  - residential and non-residential end users who have subscribed for their site(s) with power less than or equal to 36kVA: these customers benefit from regulated electricity tariffs on request. They can thus shuffle between regulated and market tariffs without a legal time limit;
  - non-residential end users who have subscribed for their site(s) with power greater than 36kVA: only customers benefiting from regulated tariffs from the date the NOME law was enacted and sites created after that date may continue to benefit until 31 December 2015. They can shuffle between regulated and market tariffs provided they maintain their account and regulated tariff for at least one year. After 1 January 2016, these same customers will no longer benefit from the regulated sales tariff for consumption by these sites;
  - residential and non-residential end users for their sites located in areas not interconnected to the continental French network: these customers benefit from regulated electricity tariffs on request.

Only EDF and the LDCs supply electricity at the regulated sales tariffs.

1. Source: the 2012 French Electricity Report published by RTE.

2. Source: GRT gaz - Gas consumption in 2012.

3. Source : groupe.direct-energie.com website, section "The Group".

4. Source: gdfsuez.com website (press file presenting the Energy Europe business line – 1 February 2012, p. 14).

5. Rounded value of the precise value, expressing one decimal.

- Natural gas:
  - residential and non-residential end users who consume less than 30,000kWh of natural gas per year: these customers benefit from regulated natural gas tariffs on request. They can thus shuffle between regulated and market tariffs without a time limit;
  - residential and non-residential end users who consume more than 30,000kWh of natural gas per year: these customers can no longer benefit from regulated tariffs once they have opted for a market-rate contract;

Only GDF Suez and the LDCs supply natural gas at the regulated sales tariffs.

### **The tariff structure and the principle of the integrated electricity tariff**

The tariff structure includes a range of regulated tariffs applicable to electricity sales. There are three tariffs:

- Blue Tariff: tariff available to sites whose subscribed power is less than or equal to 36kVA;
- Yellow Tariff: tariff available to sites whose subscribed power is strictly greater than 36kVA, and less than or equal to 250kVA;
- Green Tariff: tariff available to sites whose subscribed power is strictly greater than 250kVA.

Changes in these tariffs are fixed by order of the French Economy and Energy ministers, after consultation with the CRE.

These regulated tariffs are provided by the traditional suppliers (EDF and the local distribution companies ("LDCs")). They include a fee for making the load available and a variable amount proportional to consumption, with prices that may be adjusted depending on the time of day or season. The range of tariffs has been designed to take into account changes in customers' consumption with various options (peak hours / off-peak hours for residential customers, for example).

The tariff is known as "integrated" because it covers all of the following elements:

- the "supply" portion (around 60% of the tariff cost excluding tax in the case of residential customers on the Blue Tariff) comprising: (i) the "energy" portion based mainly on operational and investment costs in generating facilities (including downstream processes and R&D) and (ii) client management costs and marketing costs;
- the "network" portion (around 40% of the tariff cost excluding tax in the case of residential customers on the Blue Tariff) comprising the cost of using the public transmission network operated by RTE and the public distribution networks operated by distribution network operators, also called the "delivery" portion.

The decree of 12 August 2009 thus stipulates that the fixed portion and the proportional portion for each tariff version or option are the addition of a portion corresponding to delivery to a portion corresponding to supply, and that these are drawn up in such a way as to cover generation costs, supply costs, the cost of using the public transmission and distribution networks and marketing costs, borne by EDF and Local Distribution Companies (LDCs) to supply their customers, as well as a reasonable profit margin.

As part of its public service missions, EDF since 1 January 2005 has also offered a basic necessity tariff for electricity in accordance with the conditions set out in Decree No. 2004-325 of 8 April 2004. This decree was amended by the Decree of 6 March 2011 with a view to allowing the automatic allotment of the tariff to all customers fulfilling the granting conditions.

Lastly, Decree No. 2008-778 of 13 August 2008 made under Article 7 of law No. 2003-8 of 3 January 2003, today codified as Article L. 445-5 of the French Energy Code, implemented a special solidarity tariff for gas provided by all suppliers, financed by a contribution that will be passed on to all end customers.

Customers benefiting from regulated tariffs receive a single electricity bill for supply, delivery and associated taxes. This bill indicates the network usage cost portion calculated on the tariff for using the public electricity transmission and distribution networks (TURPE), set by the CRE proposal (see section 6.2.2.4 ("Tariffs for Using the Public Electricity transmission and distribution Networks ("TURPE")")). The separation of generation-sales and marketing activities from those of transmission-distribution is thus highlighted. The following taxes and contributions appear on the electricity bill:

- value-added tax (VAT);
- contribution to the Public Electricity Service or CSPE (see section 6.5.4.2 ("French legislation: Energy Code")), which was set on 1 July 2011 at €9/MWh and on 1 July 2012 at €10.5/MWh, and finally at €13.5/MWh on 1 January 2013. Since 1 January 2012, the CSPE has been capped at €559,350<sup>1</sup> per consumption site and per annum, and the total amount due in respect of this contribution by all industrial companies consuming over 7GWh of electricity per annum is also capped at 0.5% of its added value;
- municipal and departmental taxes, collected and reversed by EDF to municipalities; on 1 January 2011, the NOME law transposed Directive 2003/96/EC of 27 October 2003, restructuring the community tax structure for energy and electricity products and transforming them into taxes on end-usage electricity consumption (TCFE);
- The CTA levy (*Contribution Tarifaire d'Acheminement*), which contributes to covering a portion of the fees for the pension system (see section 17.5.1.1 ("Special pension plan")).

At 23 July 2012, the increase excluding tax of regulated sales tariffs was 2% for all tariffs, in line with the Decree of 20 July 2012. This increase was identical for each tariff colour. It did not provide an opportunity to reform the structure.

Another Decree of 20 July 2012 on electricity sale tariffs to other Local Distribution Companies entailed a 2.3% rise in these tariffs from 23 July 2012.

In October 2012, the French Council of State annulled the 2009 tariff decree (decision published in the *Journal Officiel* dated 25 October 2012) and said that the government had to issue an amending decree within three months. Different reasons were given for this depending on the tariff. For the Blue Tariffs, the Council of State said that the decree established an unjustly unequal system between eligible customers based on their status. As for the Yellow and Green Tariffs, the Council of State said that the decree did not establish "clear criteria" for the application of the various tariff categories, options and versions.

A new decree dated 14 February 2013 was published in the *Journal Officiel* on 15 March 2013. This decree defines the various tariff categories and readjusts the rates for non-residential Blue Tariff customers only. The financial impact for the EDF Group is estimated to 7 million euros in 2012.

A bill being discussed in the French National Assembly in early 2013 would set up a bonus/penalty system for residential customers based on their level of electricity consumption (other forms of grid-bound energy are also affected). If it is approved, the first bonus/penalty payments and with them the initial financial impacts would occur in early 2016 based on 2015 consumption.

#### **6.2.1.2.1.4 Market-rate contracts**

In France since 1 July 2007, those customers who have never exercised their eligibility right have been free to leave the regulated sales tariffs at any time and without notice to pursue an EDF contract or one provided by another supplier. Those customers with power level commitments over 36 kVA who exercised their eligibility right after 7 December 2010 and chose to return to regulated tariffs must continue to hold them for at least one year (see Section 6.2.1.2.1.3 ("Regulated sales tariff contracts")). With the exception of customers connected to the transmission network, who must sign separate transmission and delivery contracts, all other customers who have exercised their eligibility right may enter into a single contract with the supplier of their choice for their electricity supply and delivery. As is the case

1. Ceiling updated every year based on the consumer price index.



for regulated sales tariffs, their electricity bill includes the electricity supply price, the transmission and distribution network access tariff ("TURPE"), and government mandated charges: CSPE, CTA, local taxes or TCFE following implementation of the NOME law, and VAT outlined in section 6.2.1.2.1.3 ("Regulated sales tariff contracts").

## 6.2.1.2.2 Customer Division

EDF's sales and marketing activities in France are managed by the Customer Division.

### 6.2.1.2.2.1 Introduction and marketing strategy

EDF markets energy and services to nearly 27 million customers in France (excluding Overseas departments and Corsica), that is more than 32 million sites.

On the electricity market, EDF's sales stood in 2012 at 377.9TWh<sup>1</sup>, giving a market share of 80%. In 2011, sales stood at 370.2TWh and market share at 80.2%.

EDF provides gas supply to all its customers.

In 2012, EDF marketed 20.9TWh, giving a market share of 4.3% on over 880,000 sites. At the end of 2012, EDF supplied gas to about 780,000 residential customers (versus nearly 619,000 at the end of 2011).

To supply its customers with gas, EDF has access to the gas market and its oil products through its subsidiary EDF Trading, and also owns medium- and long-term assets (molecular and logistical). The Customer Division establishes its sourcing strategy based on the challenges and risks specific to each customer segment.

EDF wants to strengthen the value of its portfolio by increasing loyalty among its customers via the excellence of the customer relationship and by proposing offers that respond to the new competitive and environmental challenges. To this end, EDF is implementing a marketing and contact strategy over several channels, while strengthening its operating performance.

EDF promotes energy efficiency in supplying electricity thanks to offers (at regulated tariffs or market rates) that provide an incentive to manage demand and smooth out peak consumption. This range of offers will be gradually broadened depending on the deployment of smart meters (see section 6.2.2.2.5 ("Future challenges (replacement, development and smart meters)")).

In addition to electricity supply offers and the gas offers that supplement them, the Group assists its customers in all market segments with energy efficiency and decentralised generation actions and investments. EDF provides energy efficiency offers that enable its customers to make the choices best suited to their situation and control their energy spending or guides them towards qualified partners.

This procedure meets the objectives of the POPE law of 13 July 2005 on energy policy guidelines and the associated application decrees, and the Grenelle 2 law of 12 July 2010 (see section 6.5.6.1 ("Basic regulations applicable to the environment, health, hygiene and safety")), thus enabling EDF to earn energy savings certificates (CEE) in return for actions taken with its customers. In this context, EDF is developing high-performance electrical solutions (heat pumps in well-insulated buildings, electric vehicles, etc.). With the greatest level of commitments, EDF is the largest recipient of energy savings certificates (see section 4.1.2 ("Risks associated to Group activities")).

Furthermore, EDF is positioned as a major player in the transition towards a low-carbon society thanks to its visible and sustainable action on the ground.

EDF is committed to the promotion of future electrical smart systems. The Group is preparing and experimenting with tariffs and service offers by taking part in the design and operation of projects like the Smart Electric Lyon demonstrator, which consists of testing innovative electrical solutions with some 10,000 residential and tertiary customers in partnership with industry and academia.

EDF also has considerable investments in the development of electric mobility vehicles. Present throughout the country, it has strong links with the French population, the industrial network and all local governments and licensing authorities. This presence also helps fulfil the public service values: customer proximity, service continuity, professionalism and social responsibility.

In this regard, the Group acts to ensure that electricity does not become an aggravating factor in insecurity. Its approach, centred on maintaining access to energy and energy efficiency, includes the implementation of subsidised energy tariffs and accompanying protection measures, support for customers in difficulty and contributions to the Housing Solidarity Fund and the "Live Better" programme. EDF's approach is complemented by targeted partnerships with public authorities and players in the associative sphere working to combat energy insecurity.

### 6.2.1.2.2.2 Activity by client category

#### A. Residential customers

As at 31 December 2012, EDF had nearly 25 million residential electricity customers and over 780,000 gas customers. In 2012, its sales volume amounted to 142.4TWh of electricity and 8.9TWh of natural gas.

For residential customers, the goal of EDF's customer relations policy is to strengthen customer confidence over the long term and to meet their expectations as fully as possible, especially when it comes to controlling their energy consumption.

Since November 2012, EDF has been making committed efforts with its customers through its eight "EDF & Me" commitments.

Through these eight commitments, EDF's strategy is to offer its customers, in a changing and uncertain environment, a new understanding of its role as their energy supplier. In this sense, they are the visible sign of a local, personalised relationship that will help control energy consumption.

These eight "EDF & Me" commitments offer simple and concrete personalised responses to EDF residential customer expectations. They are:

- offering plans suited to customer needs;
- billing as fairly as possible;
- offering flexible and personalised terms of payment;
- listening to customers to give them the best advice possible;
- helping them be better energy consumers;
- reimbursing them as soon as possible;
- always giving an answer if they make a claim;
- assisting them in difficult times.

In terms of customer satisfaction, more than 88% say they were satisfied after dealing with EDF in 2012. The new bills introduced in late November 2012, which are simpler and more ergonomic, as well as the EDF & Me commitments, contributed to increased residential customer satisfaction.

1. Data exclude domestic sales, sales to foreign operators, and block exchange notices; including Eurodif contract processing, adjusted for cut-offs.



### Residential customer brands

EDF's business in the residential customer market focuses on two major challenges: the relationship based on the energy contract and assistance with energy savings. In 2012, EDF chose to distinguish its customer relationship by refocusing the EDF brand on the customer relationship stated in the energy contract and repositioning the Bleu Ciel brand around household Energy Savings, thus basing its offers, support and services on energy efficiency for residential customers.

### Energy supply

EDF supplies the regulated sale tariffs for electricity and since 1 July 2007, it has also offered its residential customers natural gas and electricity at market rates ("My natural gas contract" and "My electricity contract").

For its marketing activity on the residential customers market (over 30 million incoming calls, 112 million customer bills annually, over 7 million secure online customer accounts), EDF is implementing a marketing and customer relations strategy based on several features: more than 100 stores nationally, around 40 customer service centres (CSC) open from 8.00am. to 9.00pm six days a week; several hundred retailers; a voice-response system; a website; and smartphone applications with secure access to contract management.

### Services for residential clients

EDF has the whole range of offers and services aimed at residential customers:

- "supply-related" services: safety of indoor installations (*Diagnostic Sécurité Electrique*), network of partners providing maintenance services for natural gas water heaters, insurance (energy bill insurance – "AFE"), energy management system ("*Suivi-Conso*"), electrical and plumbing outage assistance ("ADEP"), payment methods (e-billing, direct contact billing service, online branch, etc.); and
- "energy management-related" services: free advice on various heating systems or insulation solutions, diagnostics, personalised insulation and heating assistance ("*Objectif Travaux*", "*Estimation Travaux*" and "*Mon Diag Conso Habitat*" offers), as well as financing for all home thermal energy savings projects, including equipment maintenance and services provided by "EDF Bleu Ciel®" partners ("*Prêt Habitat Neuf*" financing solutions for new construction, "*Prêt Rénovation Bleu Ciel® d'EDF*" for existing structures in partnership with Domofinance).

EDF has set up several marketing partnerships to support these offers, notably with:

- Cardif to set up a group insurance agreement covering electricity or gas bill payments in the event of death or disability of an EDF customer ("AFE");
- Crédit Foncier for all residential customers with construction projects in compliance with "EDF Bleu Ciel®" specifications;
- Texeurop to set up a construction estimate service "*Estimation travaux*".

Additionally, a partnership was established with Axa Assistance and Europe Assistance for their "Outage Assistance" programme for both residential and business customers.

### Earning of energy savings certificates

Regarding residential customers, energy savings certificates are earned from:

- offers providing solutions for home energy efficiency renovation (heating, hot water, insulation and ventilation) using high-performance materials. In addition to advice and check-ups, customers are put in touch with EDF "Bleu Ciel®" partners, who handle and coordinate the general contracting. EDF has thus supported some 1,800,000 renovations since mid-2006, 600,000 of which have been for low-income housing;
- EDF's partnership strategy, under which qualified small construction and renovation professionals are granted "EDF Bleu Ciel® partner"

certification provided they comply with EDF Bleu Ciel® quality and ethics charter. Certification involves the granting of a brand licence that states the precise conditions and sets the commission that the partner pays to EDF. This network of partners allows customers carrying out construction or renovation work on their homes to have access to approximately 5,000 professionals in all aspects of the building trade, all of whom are committed to energy efficiency, alongside EDF.

EDF also contributes to training and the promotion of energy savings efforts such as:

- FEEBAT (*Formation aux Économies d'Énergie des salariés et artisans des entreprises du Bâtiment*, or Energy Savings Training for Construction Craftsmen and Companies): this programme was created with building trade professionals and the French Environment and Energy Management Agency (ADEME) to develop businesses' ability to respond to the energy efficiency renovation market. Since 2008 more than 52,000 professionals have been trained, thanks to EDF funding under the energy savings certificates programme. The system was opened up to materials distributors and project managers;
- overhaul of the "*Grenelle de l'Environnement*" best practices: this programme, launched by the Minister of Ecology, Energy, Sustainable Development and the Sea in November 2007 with building trade organisations, is designed to help businesses grappling with issues related to the Grenelle environmental action plan. Updated and integrated into reference training materials, including FEEBAT, these new rules will improve the quality of implementation of the renovations.

### Solidarity policy

EDF takes part in the scheme financed by the CSPE implemented to help people in difficulty and facing financial insecurity. Low-income customers can access subsidised energy prices for electricity and natural gas, as well as free arrangement and start-up. By the end of 2012, 1,083,000 households (mainland France, Corsica and overseas departments) benefited from a basic necessity tariff (TPN), and 57,000 benefited from a special socially responsible tariff for gas.

In 2012, EDF contributed €22.9 million to the Housing Solidarity Fund ("FSL"), which helps to write off unpaid bills for customers in financial difficulty. In 2012, it helped more than 190,000 households.

Over and above its legal obligations, EDF promotes its "energy guidance" offer bringing together services and advice about rates, usage, energy management and payment terms. In 2012, over 324,000 people took advantage of it.

To be closer to disadvantaged people, EDF provides 170 local contact points, in addition to its store network. The many partnerships developed by EDF with specialised associations in social mediation, such as PIMMS (Multiple Service Mediation Information Point), ANIL (National Housing Information Agency), a partner since October 2011, and other local bodies make these structures recognised sites for the dissemination of information and mediation, thus making public services easier to use. In 2012, EDF's Senior VP of Sales & Marketing was elected Chairman of the National Association of PIMMS.

EDF also supports awareness-raising in terms of energy management and home renovation, from both a financial and technical perspective, thanks to many partnerships, low-income housing agencies, and the Fondation Abbé-Pierre. In 2012, EDF renewed its partnership with the Foundation as part of the "*Toits d'Abord*" ("Roofs First") programme, which is the successor to the "*2,000 Toits pour 2,000 Familles*" ("2,000 Roofs for 2,000 Families") programme; EDF is also supporting actions to raise energy consumption awareness with CCAS, SOS Familles / Emmaüs France, Secours catholique, Secours populaire, and with the association Unis-Cités, as part of the "*Mediaterrés*" programme.

EDF has also strengthened its commitments to the National Agency for Home Improvement (ANAH) in connection with the "Live Better"

programme. The Agreement signed in September 2011 under the aegis of the government in response to the Grenelle 2 law requires EDF to make a financial contribution of as much as €49 million over three years. This has made possible the commitment to the renovation of 13,000 homes occupied by owners affected by fuel poverty. EDF contributes to the mapping of targeted households and provides expertise in energy management actions (awareness-raising/training).

In return for these commitments, EDF is given energy savings certificates.

## B. Corporate and business customers

EDF has some 1.8 million corporate and professional customers, with 2012 sales of 188.3TWh for electricity at the regulated sale tariffs and market rates and 10.4TWh for natural gas.

EDF assists its corporate and professional customers in managing their energy consumption, regardless of their sector of activity, their size or their organisational structure. It aims to make energy performance an integral part of the overall performance – both economic and environmental – of companies. Consistent with 2010 and due to the completely new context ushered in after the implementation of ARENH on 1 July 2011, EDF changed its range of offers dedicated to companies as well as its relational system.

As part of the long-term, 24-year contract signed in 2008, EDF and the consortium founded by seven major industrial groups (Exeltium) signed two amendments. These agreements thus deal with total supply of 311TWh, delivery of which is scheduled in two stages. The first stage covers 148TWh and began in the first six months of 2010. EDF currently has no projections for the start date of the second stage. The aim of the partnership is to secure part of the electricity supply of electricity-intensive industrial partners, who are Exeltium shareholders, under the supervision of the European Commission.

### The offers

The EDF range of offers is adapted to customers' expectations and their respective profile, specifically with electricity supply offers providing competitive solutions that comply with new market rules as set out by the NOME law.

EDF also enhanced its range of services intended for all its customers, whether small companies or large industrial customers. These services are designed to:

- simplify contract management and optimise energy expenditure: with the help of a multi-site bill, paperless billing, consumption monitoring, customised alerts, a wide range of payment options, etc.;
- optimise energy efficiency projects. EDF supports companies of all sizes in their projects and implementation in three areas: building insulation, energy efficient or renewable energy equipment installation, and industrial process improvement in conjunction with its energy efficiency service subsidiaries. This approach enables EDF to earn energy savings certificates ("CEE") and thus meet its statutory obligations;
- the services offered respond to customer expectations: audits, engineering and detailed studies, equipment delivery and installation, operating services and maintenance of newly installed equipment, financing options and remote monitoring of energy-efficient performance, etc.

To strengthen its expertise and best respond to its customers' investment projects, EDF has sought out partners, more than 450 companies committed to energy efficiency and the reduction of CO<sub>2</sub> emissions, to:

- support customers in the "low carbon" strategy: highlighting the value of commitments to renewable energy, diagnostics, carbon reduction and offsetting, and monitoring and assessing savings made;
- promote remote monitoring solutions for customer energy consumption developed in partnership with NetSeenergy. NetSeenergy is a wholly owned subsidiary of EDF. It produces the "Télé-Suivi Courbe de Charge"

service, which gives customers access to an online graph of their consumption load curves. Since 2010, the Company has broadened its range of remote energy efficiency services, with the use of the latest developments in smart metering technology. Diagnostic and advisory services provided by a specialised team of energy experts are offered in addition to the remote services.

Finally, its research continues to guide it towards new areas of innovation, such as smart grids, a cutting-edge and growing field. Its research into equipment enabling remote electrical usage disruption contributes to research on smoothing peak loads.

In order to be ever closer to the varied expectations of its customers, EDF in 2010 set up differentiated services devoted to large industrial customers, specifically with:

- custom electricity and gas supply offers;
- the development of interruption capacity for their customers;
- assistance on a European level through entities of the EDF Group. EDF has a "Large Corporates and Key Accounts" marketing network for managing large corporate customers who operate on a European scale and have a centralised purchasing structure. This coordinated network spanning seven European countries (Belgium, Italy, the United Kingdom, Austria, Hungary, Slovakia and Poland) thus offers multi-country energy solutions;
- support for controlling their energy consumption and CO<sub>2</sub> emissions through the implementation of Energy Productivity Contracts (PPE). These contracts rely upon EDF Entreprises' expertise in terms of eco-efficient solutions in processes and utilities, proposing initiatives to be implemented and guaranteeing the resulting savings. These initiatives lead to energy savings investments that benefit the CEE system;
- CO<sub>2</sub> trading for companies subject to the French national quota allocation plan (PNAQ).

In addition to supplying electricity and services, EDF markets a full range of offers for the supply of natural gas intended for its customers. It offers them a single contact and simplified management of electricity and gas contracts. EDF has reorganised its sourcing activities and natural gas development offers to improve reaction time and thus offer its customers quickly customised solutions based on market opportunities and their expectations. The natural gas offer features management and advisory services, including online monitoring, annual consumption assessments, energy savings check-ups and other services.

With its business offers, EDF aims to make its customers' lives easier by offering them advice and solutions for better control of their energy consumption, optimising their bills, providing repair services and ensuring the continuous functioning of their electrical and plumbing systems.

### Relational system

EDF uses a full relational system to stay close to its customers, their issues and their expectations. Its employees in its eight regional sales divisions and one Key Accounts national division put EDF's expertise to work supporting and processing customer requirements.

With efficiency and proximity at the heart of the customer relationship, EDF employees use solutions that suit customers, according to their profiles and consumption habits, with the intent of encouraging dialogue and making it easier to access information. Accordingly, in addition to classic communication channels, EDF has also developed:

- a website specifically dedicated to companies. On the site they can perform standard operations, find a simplified presentation of offers, read the energy magazine or access a Frequently Asked Questions page classified by theme;

- The energy monitoring organisation, which was set up in 2009 with the aim of offering customers a place to talk about corporate behaviour in an ever-changing energy context and to offer issues to reflect on in terms of the adjustments required to cope with the new challenges of energy.

## Customer satisfaction

Since 2011, EDF Entreprises has been committed to a programme to improve customer satisfaction. The "S9" programme is based on nine projects (one per operational entity) and nationwide guidance to share best practices, analyse and communicate unit results and implement nationwide policies.

In 2012, a decision was made to emphasise improvement of claims processing. A new, simpler and more efficient policy was implemented, and new tools and training to help support staff handle a customer filing a claim were also deployed.

The programme contributed to a vast effort in improving satisfaction both regionally and nationally:

- increased visibility of Customer Satisfaction on the business market;
- contribution to the development of a customer-oriented culture;
- mobilisation of managers and business lines;
- emulation, discussions and sharing between regions.

Since this strategy was launched, results for satisfaction for customers contacting the company were up 12 points, due in large part to a marked improvement in satisfaction of customers filing a claim.

The effort will be continued in 2013, and its goal will be to increase not only customer satisfaction but encourage customer loyalty.

## C. Local authorities, low-income housing agencies, Local Distribution Companies (LDCs) and public service providers

Law No. 2009-967 of 3 August 2009 regarding implementation of the Grenelle environmental action plan gives local authorities a major new role in local energy policies. In this context, EDF has strengthened its links to the local community by offering each authority and public institution with decentralised decision-making powers (hospitals, universities and major graduate schools, CROUS student service centres, chambers of commerce and industry, ports and airports), a designated local contact person.

EDF acts in five areas for these customers: supplying electricity at the regulated sale and market rates and gas at the market rate, responding to customer energy problems (proposing customised offers and solutions for energy needs), help with their various plans (national climate plan, green neighbourhoods, sustainable cities, etc.), signing supply concession agreements in connection with ERDF and developing sustainable mobility offers with local authorities.

EDF thus manages more than 55,400 customers in this market: local authorities including municipalities and public institutions for inter-municipality cooperation (cities, metropolitan areas, inter-municipal associations); regional and general councils; public institutions (secondary schools and sixth-form colleges, nursing homes, etc.); 2,754 regional public institutions, 956 public and private agencies for public housing (low-income housing agencies); and 159 LDCs (137 electric, 19 combined gas and electricity and three gas).

All of these customers account for about 1.2 million electricity sites, of which 266,000 are for low-income housing agencies, with an annual consumption of 29.3TWh, and 4,700 natural gas sites with an annual consumption of 1.7TWh. Coupled with that are 17.8TWh of electricity sold to LDCs in 2012.

In 2012, overall customer satisfaction increased by 3 to 5% for local authorities and even more for low-income housing agencies and LDCs. They were asked questions about the quality of their interaction with customer service, the advice given, responses to claims, and actions to relieve energy poverty.

## Customer solutions and offers

IEDF enhanced its range of electricity offers by adding more targeted offers according to sector of activity ("Winter Sports" offer, "Secondary Schools-Sixth-Form" offer, and "Public Lighting" offer). This complemented the "Balance" (*Équilibre*) offer, produced using renewable energy sources. In 2012, these offers were made in a version whose rates were indexed to changes in the ARENH.

EDF also offers:

- customised management services to municipal and low-income housing agency customers, specifically web-based cost and consumption monitoring, *di@lège*, e-billing, customised bill consolidation or billing data sent electronically;
- a "cost amount offer" ("CAO") designed for low-income housing agencies. Its aim is to enhance energy efficiency in low-income housing and allow EDF to earn energy savings certificates. In 2012, some 150,000 low-income housing units were assisted thanks to this offer;
- the signing of agreements with local authorities to control their energy consumption. Some local authorities have been granted responsibilities in the area of energy, and they coordinate specific initiatives in Energy Demand Control ("EDC") and renewable energy sources ("ENR") in their geographical areas;
- high-performance energy efficiency offers, such as the "Infrastructural Energy Analysis" offer allowing governments and housing agencies to categorise and prioritise energy savings and CO<sub>2</sub> reduction initiatives for their infrastructure through a multi-criteria approach (energy and environmental criteria, technical standards, etc.); a range of EDC and ENR-related advice permitting assembly of an optimal building programme through detailed energy analysis of selected buildings; and the "Development-related Energy Analysis", which enables upstream land-use planning and evaluation of local energy solutions optimised according to societal, economic and environmental criteria;
- low-carbon solutions for evaluating, reducing and compensating for energy consumption-related carbon emissions of a building or of the organisation of an event;
- assistance in raising awareness through innovative communication tools and events such as training courses and green toolkits.

### 6.2.1.2.3 For sustainable Cities and Territories

Energy development of cities and territories is now naturally associated with sustainable development objectives: environmental impact, local economic activity and job insecurity are major concerns of local communities.

To accompany this transformation of communities and stakeholders in cities, EDF, with the help of its R&D expertise and field experience, has developed energy solutions that promote renewable energy and are economically relevant, low-carbon, reproducible, adaptable to the specificities of each territory or urban project.

Accordingly, EDF and its subsidiaries and partners offer:

- advice for identifying renewable energy potential in a territory, defining local energy strategies, and making comparison among possible energy solutions;
- innovative energy networks such as thermal energy networks using heat pumps;
- renovation of public buildings and individual houses;
- the implementation and operation of electric transport (recharging infrastructures, electric vehicle car sharing solutions, etc.);
- innovative solutions for local energy production (photovoltaic, biogas, biomass, etc.), depending on the character and potential of each project;

- educational activities for saving energy on a daily basis as well as energy management services based on measurement and analysis of consumption and the actions needed involving all stakeholders.

All of these components (upstream advice, implementation and operation) constitute the foundation of an approach for sustainable cities and territories, in both new neighbourhoods and existing urban areas.

Through balancing a pragmatic approach based operational projects in response to the needs of communities and stakeholders in the city and innovations in research and development, EDF is a unifying benchmark reference for sustainable cities and territories.

#### 6.2.1.2.2.4 Public electricity distribution concessions

Public electricity distribution concessions cover two separate assignments:

- development and operation of public distribution networks for which ERDF is responsible (see section 6.2.2.2.2 ("Distribution activities"));
- the supply of electricity to all customers at regulated rates throughout the concession territory, the responsibility of EDF (EDF Commerce) for the entire territory of metropolitan France, excluding LDCs. This assignment consists of providing electricity to all Blue, Yellow, Green and TPN tariff customers in compliance with the concession specifications commitments (such as subscription, payment, and delivery terms and contracts).

Each concession agreement is co-signed by EDF, ERDF and by the licensing authority, which is a municipality or group of municipalities. The public distribution of electricity is carried out under 665 concession agreements, of which 45 are within the boundaries of a single department.

About 50 concessions will expire by 2015. Discussions are currently underway with Niort and Orléans, and discussions with the city of Lyon have already resulted in the signing of a rider to extend. An organisational structure was established to, among other things, renew the concession agreements, mobilise both national and regional expertise, develop and improve the Concession Activity Summary Reports (CRACs) each year and meet the oversight demands of the licensing authorities.

#### 6.2.1.2.2.5 Promotion of electric vehicles

The momentum for electric vehicles, to which the EDF Group has been committed for a long time, is now irreversible in industrialised countries. Based on its years of experience and advantages in the field, the Group has since 2011 been clearly oriented towards a role of industrial operator.

The Group's commercial offer as an industrial operator includes:

- a range of advice intended primarily for local authorities and B-to-B for the positioning and sizing of recharging infrastructures;
- installation of recharging infrastructures for all customer segments, from individual consumers to communities and B-to-B and supermarket parking lots;
- remote management and supervision of recharging stations;
- small-scale car-sharing solutions in urban neighborhoods;
- continuation of the "on-board energy" service, i.e. rental and maintenance with performance guarantees for batteries for heavy vehicles (buses, trucks and electric river shuttles).

The expertise of the EDF Group in terms of charging infrastructures helped its subsidiary Sodetrel to be awarded the call for tenders launched by the Metropolitan Government of Nice Côte d'Azur, alongside Veolia Environnement, for the delegation of a public service for electric vehicle self-shares. Autobleue was inaugurated in April 2011, and includes 210 electric vehicles and 70 charging stations in early 2013.

The Group is also developing technology partnerships with automakers and is involved in ambitious experimental vehicles programmes. As a result, it has partnered with French participants such as Renault ("*Seine Aval Véhicules Electriques*") experiment with about 100 vehicles launched in April 2011 and December 2012 in the north of the department of Yvelines), other European participants such as BMW (50 experimental electric Minis in Paris between June and December 2011), and Japanese participants such as Toyota (experiment with 70 rechargeable hybrid vehicles in the Strasbourg region begun in 2010).

The Group has also initiated a discussion process to develop a commercial offer to allow both corporates and municipalities to discover electric vehicles without having to purchase them.

#### 6.2.1.2.2.6 Service subsidiaries supporting energy efficiency development

Subsidiaries help the Customer Division fulfil its goals in various customer categories (Residential, Business, Corporate and Local Authorities) and cover a broad scope of activities, including studies, construction, equipment maintenance, investment financing and backing in obtaining authorisations and subsidies.

The portfolio of service subsidiaries is the result of successive investments made in existing companies, as well as from the spin-off of businesses that EDF developed itself. These subsidiaries are backed by Edev (see section 6.4.1.7 ("Other equity interests") and Chapter 7 ("Organisational charts")).

#### Integration of energy efficiency services

##### EDF Optimal Solutions (EOS)

EDF Optimal Solutions brings EDF energy efficiency services to companies and local authorities. It implements global solutions that reduce energy costs and CO<sub>2</sub> emissions, such as improvements to industrial processes, the design and creation of energy power plants and fluid generation, and improvements to industrial and service buildings. Its 2012 revenue was €103 million.

Climatic and electrical engineering, renewable energies, insulation, heating, cooling and lighting systems, user-targeted communications, and performance management and control are all notable examples of the technical solutions offered.

The main competitors of EOS include vertically integrated players such as the GDF Suez group or public housing / construction players, as well as groups involving important public housing / construction players and energy services like Eiffage, Vinci or Schneider.

##### Everbat

Everbat, wholly owned by EDF, acts as a package builder for the technical aspects (heating, cooling, hot water, photovoltaics, etc.) of public and private calls for tenders from local authorities, property developers, low income housing agencies and industrial companies.

##### Heating specialists

##### CHAM (formerly Fahrenheit)

Wholly owned by EDF, CHAM performs maintenance work on central heating and hot water systems for residential customers, offices, low-income housing managers, and for jointly owned property managers. CHAM is expanding its presence throughout the country through targeted external growth operations. Its 2012 revenue was €62 million.



## Engineering firms

### Bastide-Bondoux, ETC and ICR-LBE

These engineering firms wholly owned by EDF (97% for ICR-LBE) conduct thermal studies and provide advisory and optimisation services for all new or existing residential, service or industrial buildings.

## Financial services

### Domofinance

Domofinance was created in 2003 and licensed as a financial company by the *Comité des établissements de crédit et entreprises d'investissement* ("CECEI") on 29 September 2003, pursuant to Articles L. 511-9 to L. 511-14 of the French Monetary and Financial Code.

EDF holds a 45% equity interest in Domofinance; the remaining 55% is held by BNP Paribas Personal Finance (a subsidiary of the BNP Paribas group).

Domofinance meets the financing needs of EDF residential customers who wish to integrate efficient energy solutions in their home renovation projects. In particular, it markets and finances the EDF Bleu Ciel® renovation loans.

In 2012, Domofinance granted more than 52,700 loans.

### Waste treatment

See section 6.4.1.5 ("Tiru").

## Downstream integration of smart electrical systems

Thanks to the opportunities offered by smart electrical systems, the role of electricity, an "intelligent energy" as a vector for transition towards a low carbon society specifically built around sustainable cities is another major priority around which the Group's marketing strategy is based.

Recently-created subsidiaries are now working in this strategic area.

### Netseenergy

Netseenergy, which is wholly owned by EDF, has historically developed and produced the range of services for remote monitoring of load curve (formerly "Adviso") which gives customers access to an online graph of their consumption load curves. Its 2012 revenue totalled €6 million. Since 2010, the company has been marketing a new range of energy-efficient voice-activated services in the business market.

Based on the latest technological developments in the field of smart metering, these services make it possible to identify and display energy and water consumption in buildings on an ergonomic web portal. Diagnostic and advisory services provided by a specialised team of energy experts are offered in addition to the remote services.

Netseenergy also directs a growing part of its research to new areas of innovation, in particular the growing and cutting-edge field of smart grids, and more specifically the remote electrical usage disruption to smooth peak loads (smart building). As a result, the Company is engaged in multiple demo projects in metropolitan France and the overseas departments, including the "Nice Grid" project in Provence Alpes Côte-d'Azur.

### EDEV Téléservices (Edelia)

Edelia, which is wholly owned by EDF, oversees the deployment and operation of prototypes within smart electronic systems (including the "Une Bretagne d'avance" experiment in Brittany of scattered disruption of residential customer usage, as part of the Brittany's Electricity Pact). Edelia conducts and develops full industrial solutions (such as screens, home equipment

management and experimental rate offer management) for up to as many as 100,000 customers. Its 2012 revenue amounted to €12 million. As part of pilot projects, Edelia is developing an interconnected solution with Linky solutions that is compatible with all energy savings systems installed by their customers.

## Electric vehicles

### Sodetrel

Sodetrel is wholly owned by EDF. It implements all electric vehicle projects for local authorities, businesses or individuals. As such, it continues its "on-board energy" activity, i.e. rental and maintenance with performance guarantees for batteries for heavy vehicles (buses, trucks and electric river shuttles) with offers based on lithium batteries and develops offers in the field of recharging infrastructures – installation, operation and supervision of recharging terminals. Sodetrel, in collaboration with its eco-mobility partners, also offers simple, economical and ecological car-sharing solutions.

## 6.2.1.3 Upstream/downstream optimisation - trading

### 6.2.1.3.1 Role and activities of the Direction Optimisation Amount/Aval & Trading

The primary function of the Upstream/Downstream Optimisation & Trading Division (*Direction Optimisation Amont/Aval & Trading*, or "DOAAT") is to ensure a balance for electricity between upstream resources and EDF downstream outlets in France, and to maximise the gross margin of the integrated upstream/downstream entity:

- resources: generation fleet, long-term electricity supply contracts, wholesale purchasing, purchase obligations from decentralised generating companies, contractual disruption capacity;
- outlets: long-term supply contracts, end customer sales, wholesale market sales, sales to alternative suppliers in France.

Optimisation consists of making short and medium-term economic arbitrages between the various resources available to satisfy EDF's supply commitments to its customers, while controlling risks linked to uncertainties related to generation, consumption, market events, and their financial consequences.

DOAAT's objective is to secure and maximise the gross electricity margin of the "generating-supply" entity through optimal use of upstream or downstream asset flexibility and by permanently seeking the best wholesale market purchasing and sales options.

DOAAT deals with supply in terms of fossil fuels – gas, coal and oil – for EDF's plants.

For the longer term, DOAAT is planning and proposing structural changes in the upstream and downstream asset portfolios, based on anticipated changes in the market and Company strategy in France.

For transactions on wholesale markets, DOAAT relies exclusively on EDF Trading, a wholly owned EDF subsidiary (see section 6.4.1.1 ("EDF Trading")).

DOAAT had 429 employees in France at the end of December 2012.

### 6.2.1.3.2 Upstream/downstream balance optimisation activities

DOAAT is responsible for the management of physical risks to EDF's upstream/downstream electricity portfolio and the financial consequences therein.



It maximises the Generation and Marketing gross margin by using available flexibility leverage of upstream, downstream and wholesale market portfolios, and proposing changes in value and structure of these portfolios over different time periods.

In the medium-to-long term, DOAAT's role is to create an optimised and balanced view of EDF's Generation-Marketing portfolio, by determining the financial trajectories and the landscape of acceptable physical and financial risks. The main levers of the portfolio are: (i) seeking new maintenance or operating policies with a view to improving the availability or flexibility of generation resources and adapting the fleet mix (DOAAT works in support of the DPI in this respect); (ii) segment-based market share strategies, tariff changes, scaling interruptibility and seeking new sales offers (DOAAT works in support of the DCO in this respect); (iii) adapting existing long-term contracts and seeking suitable new structured contracts; (iv) contributing to the preparation of the generation investment programme and, notably, the renewal of the fleet in parallel with the development of long-term downstream market opportunities.

Management of the electricity supply/demand equilibrium can also be considered in shorter periods (three years to one month), within the framework set by extreme risk (volume risk) and price risk policies drafted in accordance with directives of the Corporate Risk Management Division and approved by the Company's Executive Committee. From a physical point of view, the main risks for energy are variations in temperature, water availability, availability of the generation fleet and market shares. Thus, for example, a decrease in temperature of 1°C in winter leads to an increase in consumption of electricity in France of approximately 2,300MW<sup>1</sup> and, in two extreme years, the difference in available hydropower loads can reach approximately 15TWh. DOAAT also manages the exposure of EDF's upstream/downstream portfolio to price variations on energy wholesale markets (electricity, gas, coal and oil products) and the CO<sub>2</sub> emission rights market.

In order to deal with the "volume" risk, DOAAT ensures that it has sufficient power margins over all time scales to allow it to meet its commitments in almost all situations. DOAAT has a group of leverage actions: scheduling of facility maintenance operations (especially nuclear), inventory management (fossil fuels, hydropower reserves and customer disruption capacity), and wholesale market sales and purchases. DOAAT manages "price" risk through EDF Trading, which is exclusively tasked with market access on DOAAT's behalf. The sales/purchases made by EDF Trading on behalf of DOAAT are carried out in accordance with the "price" risk policy.

DOAAT is tasked with "balance responsibility" within EDF's scope in mainland France and with regard to RTE, i.e., EDF will compensate RTE financially in the event of a discrepancy within the scope of its balance management. Optimisation consists of informing RTE one day in advance of a balanced offer programme for the next day, which allows the supply costs of EDF's contractual commitments to be reduced. In order to ensure balance in EDF's scope, DOAAT can benefit from the flexibility of the customer portfolio (namely disruptions) or generation assets (assets that can be mobilised within a few hours, such as its fossil-fuel fired fleet, or within a few minutes as is the case for combustion turbines and hydropower plants), depending on their economic value and by hedging them with the "spot" sales and purchases of energy carried out by EDF Trading on the markets. Customer portfolio and generation flexibility also enable arbitrages within the same day.

In addition, DOAAT analyses and evaluates the impact of regulatory and institutional developments on the physical and financial balance of the upstream/downstream electricity portfolio: a system for allocating capacities at borders generation-marketing; reinforcement of environmental requirements.

## 6.2.1.3.3 Capacity auctions

Capacity auctions (or Virtual Power Plants – "VPPs") are the result of a commitment undertaken by EDF with the European Commission in early 2001, when EDF International acquired an interest in EnBW, to make part of its generating capacity available to the market. This commitment ended on 30 November 2011 following the buyout by the German state of Baden-Wurtemberg of EDF International's interest in EnBW in 2010.

This release from commitments did not, however, call into question the rights acquired during previous auctions. EDF will thus continue to deliver the volumes purchased to counterparts until mid-2015, at which time the delivery commitments for the longest contracts will expire. The volumes made available by EDF will thus decrease gradually to 1.5GW in 2013, 400MW in 2014 and 150MW in 2015.

## 6.2.1.3.4 Supplying electricity to alternative suppliers in France

By its decision of 10 December 2007, the Competition Council accepted and made mandatory the commitment proposed by EDF to make a substantial capacity of electricity of 1,500MW baseload available to alternative suppliers, i.e. a volume of approximately 10TWh/year over periods of up to fifteen years, at price levels allowing EDF offers to compete on the free mass market.

The initial price in current euros was set at €36.8/MWh in 2008, gradually increasing to €47.2/MWh in 2012.

These loads were made during three successive calls to tender open to all alternative electricity suppliers in France. The awards, which occurred in 2008 and 2009, enabled nine alternative suppliers to acquire 1,500MW which was the total amount of energy offered by EDF. However, the deliveries of energy relating to these auctions ended on 31 December 2012. Following the implementation of NOME, eight out of nine suppliers (four in 2012) waived the rights they acquired via this mechanism and terminated their contracts with EDF. The last supplier chose not to extend its contract beyond the first delivery term, which expired at the end of 2012.

In 2012, the total volume of electricity provided by EDF through this mechanism accounted for 5.8TWh.

## 6.2.1.3.5 Long-term electricity purchase/sales contracts

EDF has business relationships with European operators such as GDF Suez, Enel, EnBW, Axpo, EGL and Alpiq, through numerous energy purchase or sales contracts.

There are several types of contracts, relating to:

- rights to energy generated by plants, mostly nuclear, in which the counterparts hold a stake during the operation of the facility (see section 6.2.1.1.3.1 ("EDF's nuclear fleet" – "Generation allocation contracts"));
- drawing rights for electrical power, totally or partially guaranteed for a period typically between 15 to 25 years.

The portfolio of contracts represents the EDF generation fleet structure, mainly composed of nuclear facilities (EDF sells base load energy and purchases intermediate and peak load energy).

In 2012, the volumes sold and purchased represented 42.9TWh and 1.9TWh, respectively.

It should be noted that Enel's withdrawal from the EPR Flamanville 3 project, which took effect on 19 December 2012, will lead to the termination of anticipated access agreements under which Enel received 1,200MW in return for payment in 2012. This termination will occur gradually, with Enel receiving 800MW in 2013 and 320MW in 2014, under the commercial terms defined in these agreements.

1. Source: RTE.

## 6.2.1.3.6 Regulated access to electricity from the existing nuclear fleet ("ARENH")

ARENH, implemented under the NOME law, was introduced on 1 July 2011 for the benefit of EDF's competing suppliers. This system allows competitors, after signing a framework agreement, to supply their end customers located in mainland France through EDF and network operators to offset their losses.

The primary ARENH allocation mechanism is as follows: at regular intervals during the year ("windows"), EDF's competitors can make ARENH requests to the CRE for the following 12 months, based upon delivery load forecasts.

Competitors' ARENH requests distinguish between loads for large consumers (output above 36kVA, i.e. former customers on the "yellow" and "green" tariffs), for which EDF must deliver a flat product, and loads for small consumers (output below 36kVA, i.e. former customers on the "blue" tariff), for which EDF must deliver a combined product.

The CRE determines the ARENH ex-ante rights of each provider based upon provider forecasts according to their customer portfolio and to established allocation methods. It then notifies each provider about its allocated load, and EDF's aggregated load. Delivered loads in total cannot exceed 100TWh for deliveries to end users; this ceiling will be gradually increased from 1 January 2014 to take account of ARENH rights that may be beneficial to network operators' losses. ARENH rights depend on the historic nuclear generation portion of end-user consumption in France, and as such do not cover consumers' total supply. There is a possibility of revising the balancing coefficients (which guarantee that the ARENH loads match the proportion of nuclear power generation in national consumption in France) before the start of a delivery year, for example in the event that a decision is taken by a competent authority that affects annual power plant generation.

At the end of each year, the CRE settles the ARENH rights of each supplier based on actual customer consumption, in order to guarantee the usefulness of the competition-driven mechanism to the benefit of end customers. An additional price component is then billed to every supplier whose actual rights are below those allocated based on their forecast.

Until 7 December 2013 and pursuant to Article L.337-6 of the French Energy Code, the ARENH price is set by order of the Ministers for the Economy and Energy after consultation with the CRE. After this date, the price will be set by ministerial order at the proposal of the CRE, based on the economic conditions of historic nuclear electricity generation in France. The methods used to identify and account for these costs will be set by decree of the Council of State.

The table below provides a summary of energy flows on the RTE network over the last three years:

(in TWh)	2010	2011	2012 <sup>(1)</sup>
<b>Injections</b>			
Generation	550.2	543	541.4
<b>Withdrawals</b>			
Energy withdrawn for pumping	6.5	6.8	6.7
Deliveries (including losses)	513.2	478.2	489.5
<b>EXPORT BALANCE OF PHYSICAL EXCHANGES</b>	<b>30.5</b>	<b>56.9</b>	<b>45.2</b>

(1) Provisional data (definitive data from the 2012 French Electricity Report will be available in July 2013 on the RTE website: [www.rte-france.com](http://www.rte-france.com)).

RTE gives special attention to supporting the development of renewable energy in France in the best possible conditions. The development of the transmission network and interconnections is an essential element for ensuring development of renewable energies, particularly wind energy, and their integration into the electrical system.

The ARENH price has been set at €42/MWh since 1 January 2012. No information on any new ARENH price decree for 2013 has been received at the time of writing. The loads delivered by EDF to its competitors in 2012 amounted to 60.8TWh.

On 31 January 2012, the Court of Auditors published its report on the nuclear power industry. Based on the methodology developed by the Court of Auditors including the post Fukushima impact the MWh output average cost amounts to €54.2 with 2010 financial conditions on the period 2011-2025, considering the return on the capital invested, on the basis of the "economic current cost" method. This method outlines all the costs related to the operating life of the fleet and enables to compare with other generation methods.

## 6.2.2 Regulated activities in France

### 6.2.2.1 Transmission – Réseau de Transport d'Électricité (RTE)

Established on 1 July 2000 and spun off as a subsidiary on 1 September 2005, RTE Réseau de Transport d'Électricité, known as RTE EDF Transport until 24 January 2012, is the manager of the French electricity transmission network, which it owns, operates, maintains and develops. With more than 100,000km of high and extra-high voltage circuits and 46 cross-border lines, this network is the largest in Europe. Its geographical position places RTE at the heart of the European electricity market. RTE is the entity responsible for the correct operation and safety of the electricity network. It guarantees free and fair access of all users of the network.

RTE was spun off in 2005; in 2010 EDF allocated 50% of RTE securities to its portfolio of assets dedicated to financing the decommissioning of nuclear plants. RTE remained wholly owned by EDF following this transaction, but the accompanying change in governance (see section 6.2.2.1.1 ("Organisation of RTE")) led the EDF Group to cease using the full-consolidation method for RTE, which has been consolidated by the equity method since 31 December 2010.

In 2012, the RTE Group recorded net income of €407 million (see section 20.1 ("Historical financial information"), note 23 to the consolidated financial statements for the year ended 31 December 2012 ("Investments in associates")).

Grouped together in the GO15 organisation: Reliable and sustainable electric networks ("GO15"), formerly known as the Very Large Power Grid Operators (VLPGO) and chaired by the Chairman of the Executive Board of RTE in 2012, the world's 16 largest transmission network operators signed a joint declaration at the GO15 Annual General Meeting in Paris on 6 and 7 November 2012. It contends that the development of robust power grids

is essential for economic development and social well-being. As such, the GO15 operators pledged to promote the transformation of the electricity sector, focusing on the development of a new energy mix and consumption patterns, and further strengthening their intercontinental collaboration to improve the reliability of electricity grids and reduce carbon emissions.

## 2012 Energy Balance<sup>1</sup>

Electricity consumption varies greatly between winter and summer.

2012 was in relative terms a cold year, and also a leap year, causing gross consumption to increase by 2.1% compared with 2011. This increase was higher than in other countries of Western Europe. Adjusted for meteorological differences and the extra day in February, consumption was down in 2012, mainly due to the reduction in the consumption of Eurodif. Adjusted for the energy sector, French electricity consumption, in relation to reference weather conditions, appears to have stabilised at approximately 480TWh per annum. In 2011 and 2012, large-scale industry consumption generally declined at a pace of 4% per annum (excluding the energy sector). The largest declines in 2012 were in the automotive and steel industries. Consumption is also declining in paper and cardboard, and, to a lesser extent, in rail transport. By contrast, slight increases were recorded in the consumption of the metals and chemicals sectors towards the end of the year, after the all-time lows reached in late 2011. In addition to the cyclical effects related to the crisis, this trend reflects a shift in French industry in favour of less electricity-intensive activities, probably as well as the effect of energy efficiency measures. The consumption of SMEs is on the same downward trend, although to a less pronounced extent.

At the same time, residential and small business consumption has grown steadily since 2002, at a rate of +2.4% per annum in 2012. This increase can be attributed to growth in the number of households, the development of new uses – such as computing and telecommunications – and growth in the use of electric heating despite a recent slowdown. These structural changes are reflected in the geographical analysis of consumption trends in the years 2006-2011. Thus, the most industrialised regions (North and East) saw their consumption decline, while consumption rose in residential regions and those where economic activity is focused on the services (West, South-West, South-East, Greater Paris). In February 2012, France experienced an exceptional cold snap – one of the three most severe in the last 30 years – in terms of both intensity and duration. Temperatures below -10°C were observed daily in many regions. Throughout the period, daily peaks consistently exceeded the previous high dating back to February 2010, with an all-time peak of 102.1GW at 7.00pm on 8 February. It is estimated that 40% of electricity consumption during the cold snap was directly attributable to the temperature, mainly due to the big use of electric heating. The sensitivity of consumption to the temperature is confirmed at approximately 2,300MW per degree Celsius in winter. At the same time, lows in consumption, in the depth of summer nights, remained stable at barely more than 30GW in 2012. The difference between winter peaks and summer troughs has never been so pronounced, reflecting an increase in the seasonal pattern of French consumption.

The development of baseload systems and mechanisms designed to moderate consumption continues. In the industrial sector, contract-based load-management capacity reached 400MW in 2012. Scattered load management on small sites reached more than 70MW in February 2012. More targeted systems were introduced in Brittany, particularly exposed due to the small amount of local generation. They complement the EcoWatt system, which also operates in the Provence-Alpes-Côte-d'Azur region. These systems are moderate in size in view of the growth in peak consumption. The capacity obligation mechanism under development aims notably to foster their development.

In aggregate terms, since January 2012 France remains the biggest exporting country in Western Europe, with 44TWh, and Italy the biggest importing country, with 35TWh. However, France's net exports were down compared with the previous year, when they totalled 56TWh. Despite the decline in the overall balance, volumes of French exports to Belgium were up sharply; those to England and Spain increased to a lesser extent. By contrast, Germany once again provided net imports, in each of the 12 months of the year due to spare generation capacity available from other sources.

2012 was marked by growth in the contribution of renewable energies to meet demand. Power generated from renewable sources, excluding hydropower, accounted for 4.6% of the total French energy mix:

- hydropower generation enjoyed a better year than in 2011, which was the driest of the last 50 years according to Météo France;
- hydropower generation was 27% higher than in the previous year, but still below the average over the last ten years;
- wind power was nearing the milestone of 7,500MW of installed capacity as of end-2012. A new record of wind generation of 6,176MW was achieved on 27 December. The coverage rate of consumption by wind generation was 3.1% on average, with a temporary maximum of 12% on 15 April. The pace of growth, however, was slower than in previous years, with 750MW connected in 2012, compared with more than 1,000MW per annum between 2008 and 2010. This can be explained by the various economic uncertainties and regulatory changes to which the industry has been exposed;
- the photovoltaic fleet continues to grow, also at a slightly slower pace than in 2011. It had crossed the threshold of 3,500MW of installed capacity as of end-2012. Photovoltaic generation covered an average of 0.8% of consumption;
- nuclear and conventional thermal generation was down compared with 2011: total generation in France was down 0.3% compared with the previous year, at 541TWh. This slight decline, despite the fact that gross consumption was above the prior-year level, resulted in a reduction in the export balance. This situation was partly attributable to the lower nuclear generation, down 3.8% compared with 2011;
- the generation of fossil-fuel thermal power plants was down 7%. However, the decline was contained by two factors: first, the use of these plants during the February cold snap, and second, the competitiveness of coal due to its low price in the world market in 2012.

CO<sub>2</sub> emissions from the electricity sector were 7% higher than in 2011 due to increased reliance on electricity from coal, which emits more CO<sub>2</sub> than gas.

### 6.2.2.1.1 Organisation of RTE

In accordance with its articles of association, approved by Directive No. 2005-1069 of 30 August 2005, RTE is a French public limited company (*société anonyme*) with both an Executive Board and a Supervisory Board.

RTE's Supervisory Board comprises 12 members divided into three nominating councils, including four employee representatives and up to four government representatives, with the remaining members appointed by the Shareholders' Meeting.

RTE's Executive Board is made up of four members exercising their duties under the control of the Supervisory Board, within the bounds set by the Energy Code and RTE's articles of association. Subject to the approval of the Minister for Energy, the Supervisory Board appoints both the Chairman of the Executive Board and, based on the Chairman's recommendations, the other members of the Executive Board.

1. Source: RTE, *Electric Power in France in 2012*.

Directive 2009/72/EC of 13 July 2009 confirmed the principle set down by Directive 2003/54/EC according to which the management of an electricity transmission network must be performed by a distinct legal person from those performing generation or supply activities, while substantially reinforcing the obligations of independence of the transmission system operator. France chose the independent transmission system operator template, allowing an integrated group to be maintained, at the cost of severe restrictions in terms of relations between RTE and the vertically integrated entity (see section 6.2.2.1.3 ("Institutional and legislative news")). On 26 January 2012, the French Energy Regulatory Commission (*Commission de Régulation de l'Énergie*, or "CRE") certified RTE as a transmission system operator (TSO). This certification shows that RTE complies with the requirements of neutrality that are applicable to independent TSOs.

#### 6.2.2.1.2 RTE's activities

In France, RTE manages a Public Transmission Network (PTN) in application of law No. 2004-803 of 9 August 2004 and performs its missions within the conditions set down by PTN concession model specifications. These specifications were approved by decree No. 2006-1731 of 23 December 2006. An amendment was signed on 30 October 2008; it will end on 31 December 2051.

Pursuant to the aforementioned Directive 2009/72/EC, transposed on this point into Articles L. 111-3 to L. 111-6 of the French Energy Code, transmission system operators must now be certified after a process involving the CRE and the European Commission, which aims to ensure that the entity has satisfied the conditions of independence imposed by the law. RTE lodged a request for certification in June 2011. The CRE's certification decision of 26 January 2012 was published in the *Journal Officiel* on 12 February 2012.

RTE thus manages the transmission infrastructure: it operates and maintains the public transmission network and is responsible for its development, minimising costs for the community and ensuring the safety of the system, people and property.

RTE guarantees access to the transmission network: it enters into contracts with transmission network users on the basis of network access tariffs and in accordance with non-discriminatory regulations.

RTE also manages energy flows: it ensures the supply/demand balance and makes adjustments, manages electricity flows, and manages access rights to international interconnections in collaboration with neighbouring network operators. It mobilises reserves and offsets losses, carries out necessary accounting adjustments and resolves discrepancies.

RTE must confront different challenges as operator of the electricity transmission network: integration of the European market, fundamental restructuring of the power generation fleet, societal changes enforcing restrictions on the integration of new public interest infrastructures and the maintenance of industrial resources to meet the needs of customers and local authorities. To meet these demands, RTE, with the CRE's approval, is entering a new phase in terms of investments: investments have enjoyed substantial growth since 2004, and were brought to more than €1 billion per year over the period 2009-2012. To finance its investments, RTE has its own resources, based primarily on the tariffs paid by network users. This tariff is calculated without discrimination to cover all of RTE's costs, insofar as they correspond to the efficient management of transmission, and a fair return on the capital committed to investment programmes approved by the CRE (see section 6.2.2.4 ("Tariffs for Using the Public Electricity transmission and distribution Networks ("TURPE")") below).

##### 6.2.2.1.2.1 Management of the transmission infrastructure

###### Maintenance

RTE maintains the transport network through daily maintenance, emergency repairs and replacement at the end of life or after damage.

Following the storms of 1999, RTE implemented a mechanical safety programme. Undertaken with numerous external subcontractors, the programme's objective is to protect against major climate events by strengthening the mechanical resistance of overhead lines to enable them to withstand wind speeds of up to 150km/h, and the transformation or installation of approximately 16,400 anti-fall pylons in order to prevent a domino effect when wind speeds are higher.

The installation of anti-fall pylons should be completed by the end of 2013. These special pylons present significantly improved mechanical resistance and are installed every three to five kilometres on extra-high voltage lines (between 225,000 and 400,000 volts). In 1999, tree falls were responsible for 50% of all damage to pylons. RTE has accordingly undertaken work to widen forest trenches. This work was 98% complete by the end of 2012.

By the time the programme is completed in 2017, RTE will have spent a total of €2.4 billion on making its network mechanically secure. This represents an average rate of expenditure of around €160 million per year. The programme involves 45,000km of overhead lines on the RTE network.

Heavy snowfall in December 2010, and the Klaus, Xynthia and Joachim storms in 2009, 2010 and 2011 respectively, which were stronger in certain areas than the 1999 storms but resulted in less damage, demonstrated the soundness and results of RTE's mechanical network security programme.

By 2017, this security work will ensure that each RTE customer delivery point will be connected to the network by at least one line capable of withstanding wind speeds equivalent to those of 1999, in compliance with the new more rigorous mechanical resistance standards.

2012 confirmed the good results achieved in recent years in terms of power quality. Outage times for RTE customers were accordingly equal to 2 minutes and 18 seconds excluding exceptional events. This reflects efforts to limit the number of incidents and their consequences implemented within the framework of development, maintenance and system operation policies.

#### Development and realisation of new investment in the transmission network

In addition, RTE is continuing to develop the network. These projects are part of a trend towards a growing need to meet the challenges of the energy transition. RTE every year prepares a multi-annual investment programme submitted to the CRE. In 2012, RTE invested a total of €1,361 million, of which €1,232 million for network facilities. The construction of the direct-current line between France and Spain and that of that 400kV Cotentin-Maine line accounted for most of this. In 2013, RTE's investment programme amounts to approximately €1,440 million, an increase of approximately €80 million compared with 2012. The increase corresponds mainly to plans to reinforce regional networks. RTE's investments are part of a trend towards a growing need to meet the challenges of the energy transition. In 2012, the regulated asset base (RAB) increased by €368 million, from €11,302 million at 1 January 2012 to €11,670 million at 1 January 2013. For the record, the RAB is remunerated by the WACC tariff of 7.25% before tax. It represents RTE's industrial asset base, after deduction of investment subsidies, and is calculated excluding assets in progress (which are remunerated at the tariff of 4.8%).

##### 6.2.2.1.2.2 Management of energy flows

###### Cost allocation

The costs corresponding to the "balancing offers" activated by RTE as a result of negative imbalances are passed on to the balance responsible entities (generators, traders, suppliers, etc.) in proportion to their imbalance. In the event of positive imbalances, RTE financially compensates the balance responsible entities.



## Interconnections

RTE manages access to international interconnections in collaboration with the transmission system operators of neighbouring European countries.

The European electricity transmission networks are interconnected and ensure that energy can be transmitted from one country to another. These interconnections are used to ensure the operating safety of the electricity transmission networks (in particular using neighbouring electricity generation or transmission equipment to compensate for a major generating or transmission unit outage in France and vice versa) and to develop the European electricity market by enabling an electricity supplier to sell its energy to a customer in another country in the European Union. Moreover, these interconnections, by working on the basis of time differences between peak-loads on different sides of borders, enable generation capabilities to be better shared at a European level.

### Interconnection between France and Spain

INELFE (Interconnection Electrique France Espagne) is a Franco-Spanish company created in October 2008 to carry out the whole of the interconnection project between France and Spain, from the initial feasibility studies through the completion of the actual construction work. It will guarantee that the technical and environmental solutions selected by France and Spain for this project are consistent. INELFE is a French simplified limited company 50-50 owned by RTE and its Spanish counterpart REE (Red Eléctrica de España), which benefits from the structures and expertise of both its parent companies as regards the design and construction of the link. In October 2009, the Ministry for Ecology, Energy, Sustainable Development and the Sea confirmed the route (area of least impact) proposed. By order of 22 April 2011, the French part of the Baixas-Santa Llogaia underground direct-current link, and part of the France-Spain project, was declared to be of public utility. The declarations of public utility for the "Baixas substation" and "service gallery" were also signed by the Prefect of the Pyrénées-Orientales department on 4 May 2011. The work will last three years, with commissioning planned in 2014. With this in mind, an agreement signed on 6 October 2011 between BEI, INELFE, REE and RTE provides for the participation of BEI in financing the France-Spain underground interconnection link in the form of a €350 million loan granted to the two system operators, REE and RTE. This funding will represent half of the project's total budget of €700 million.

As part of the EEPR (European Energy Programme for Recovery), €225 million of the interconnection's financing will also be subsidised by the European Union. It will also benefit from a loan of €350 million granted to the two systems operators, REE and RTE. This funding will represent half of the project's total budget of €700 million. The main aim of this new interconnection is to double the electricity exchange capacity between the Iberian peninsula and the rest of Europe, from 1,400MW to 2,800MW.

### European Network Coordination

In December 2008, RTE and ELIA created a joint venture called Coreso, operational since February 2009, with the aim of coordinating the operation of electrical grids covering France and Belgium. The creation of Coreso meets the needs of strengthening operational cooperation between transmission system operators (TSOs) as expressed both by the European Commission and by the actors on the electricity market. Coreso should enable a better integration at the regional level of output from renewable sources and guarantee a secure management of cross-border flows, which are rising sharply.

National Grid became a Coreso shareholder in May 2009, followed by Terna and 50Hertz, TSOs in Italy and north-eastern Germany, on 26 November 2010. The integration of these TSOs enabled the technical coordination centre to greatly expand the scope of its European network monitoring. The expansion is part of RTE's desire to contribute to the affirmation of European electricity networks' "common interests", and makes cooperation with other TSOs a key performance component in the dynamic of its industrial project. Coreso is now being recognised more widely as a stakeholder in the European coordination processes.

## Market coupling

Because of existing limitations in transnational exchange capacity, EC regulation No. 714/2009 establishes new European-level rules to handle network congestion problems for interconnection capacity allocation (see section 6.5 ("Legislative and regulatory environment")). In practice, there are two methods that allow for compliance with this regulation:

- interconnection capacity allocation by open auctions: the sale of exchange programming rights;
- allocation by implicit auctions: interconnection access priority is given to the least expensive energy blocks.

In the latter case, markets couplings are established. Market coupling is based on the performance of energy markets and relates to merging the order books (purchases/sales) of two neighbouring markets and creating a common price for both markets, within the limits of import and export capacities.

Trilateral market coupling of the French, Belgian and Dutch electricity markets was started in November 2006. This was a first in Europe (apart from Noordpool), and is today a success. Since 2007, electricity markets and transmission system operators in Belgium, France, Germany, Luxembourg and the Netherlands have made significant progress in electricity market coupling in the Central and Western Europe (CWE) region, and improved supply security coordination. In October 2008, seven TSOs (RTE, Elia, TenneT, Cegedel Net, EnBW, E. On Netz and RWE TSO) created a joint venture called the Capacity Allocation Service Company (CASC-CWE) to offer one-stop transmission capacity auction allocation to CWE zone country borders (France, Benelux and Germany). After more than three years of work, on 9 November 2010, RTE and its partners in the CWE region, systems operators and markets successfully launched market coupling in the France-Germany-Benelux region. Market coupling in the region enabled simultaneous optimisation of cross-border interconnection capacity for generation in all the countries within the region. Barring interconnection congestion, this will enable a flat price in all these countries.

Since the launch, a flat price has also been set throughout the day in the zone, reflecting the gains in network infrastructure usage facilitated by market coupling.

This coupling marked an important step towards creating a single European energy market. Work is currently underway to expand regional coupling to north-west Europe, including France, Germany, Benelux, the Scandinavian countries and the United Kingdom, by the end of 2013.

### 6.2.2.1.2.3 RTE's international activities

RTE International, a subsidiary of RTE created in September 2006, is RTE's interface for all engineering and consultancy services outside France, either in response to calls for tender or by privately negotiated contracts. RTE International's revenue made up a minor part of that of RTE. In 2012, RTE carried out a strategic study on the development of its international services.



### 6.2.2.1.3 Institutional and legislative news

Directive 2009/72/EC of 13 July 2009 confirmed the principle set down by Directive 2003/54/EC according to which the management of an electricity transmission network must be performed by a distinct legal person from those performing generation or supply activities, while substantially reinforcing the obligations of independence of the transmission system operator.

As part of the transposition of this directive, France decided to use the so-called "independent transmission system operator" model. This model allows an integrated group to be maintained, at the cost of high restrictions in terms of relations between RTE and the vertically integrated entity ("VIE"), including Group entities in charge of generation or supply.

These restrictions, set down in Directive 2009/72/EC, were transposed into domestic law and codified in Articles L. 111-9 *et seq.* of the French Energy Code. They mainly cover the conditions governing the exercise of the mandates of RTE's directors within the VIE<sup>1</sup>.

As regards relations with other VIE entities, Article L. 111-18 of the French Energy Code sets out the principle of prohibiting the provision of services by these entities for the benefit of RTE, with the exception of those required to ensure the safety and security of the transmission network. Confusion of image is also prohibited, requiring RTE to specifically own its brand.

Pursuant to Article L. 321-6 of the French Energy Code, RTE drafts a ten-year network development plan outlining the main infrastructure that must be built or substantially altered within ten years, investments already agreed to and new investments that must be made within three years. This plan is sent to the CRE, which checks that it covers all requirements. Every four years, it is submitted for approval to the Minister for Energy. In addition, in order to apply this ten-year plan, the Chairman of the RTE Executive Board submits the investment programme for the public electricity transmission network to the CRE on an annual basis, in accordance with RTE's medium-term financial plan.

Lastly, pursuant to Articles L. 111-34 *et seq.* of the French Energy Code, RTE must designate a Compliance Officer, who must ensure that the principle of independence is respected, and specifically check that the ten-year network development plan is correctly carried out.

### 6.2.2.2 Distribution – Électricité Réseau Distribution France (ERDF)

ERDF's main purpose is the operation and development of the public distribution network, guaranteeing its safety and security and ensuring the balance of electricity flows at all times. ERDF is a wholly owned subsidiary of EDF resulting from the spin-off of distribution activities. It has been operational since 1 January 2008. It serves approximately 34,000 of France's 36,500 municipalities. This represented 95% of the volume of electricity distributed in France, 5% being distributed by local distribution companies ("LDC").

In 2012, ERDF distributed electricity to more than 35 million points of delivery (POD) in mainland France via a network of approximately 1.3 million kilometres.

At 31 December 2012, ERDF employed 38,211 people.

In 2012, volumes of electricity carried on the ERDF network were as follows:

(in TWh)	2011	2012
Injections by RTE	338.2	351.1
Injections by decentralised suppliers	25.0	29.5
<b>TOTAL INJECTIONS</b>	<b>363.2</b>	<b>380.6</b>
Delivery	340.1	355.7
Losses	23.1	24.9
<b>TOTAL WITHDRAWALS</b>	<b>363.2</b>	<b>380.6</b>

Injections and withdrawals: ERDF delivers electricity to the installation terminals (meters) of network customers, where the withdrawals are made. A number of different operators feed power into the distribution network. It is mainly through RTE, which is responsible for transmission in France (see section 6.2.2.1 ("Transmission – Réseau de Transport d'Électricité (RTE)")), and generators, in their capacity as facilities whose size enables direct injection into the distribution network, that corresponding injections occur at source substations throughout the distribution network. These injections must compensate, at all times, for customer withdrawals and network losses. Failure to do so may result in deterioration in the quality of the supplied product (quality of the wave, voltage and even the continuity of supply).

Losses: the distribution network generates losses, which are in part due to physics (the Joule effect) and depend directly on the quantity of electricity transmitted. ERDF must compensate for these losses in order to supply the quantity of electricity required by the end-users. In 2012, the loss rate was 6.5% of electricity fed into the network, i.e. 24.9TWh. The cost to ERDF was €1,566 million in 2012. To compensate for these losses, ERDF purchases the corresponding electricity on the market by means of calls for tender, placing approximately 20 qualified suppliers in competition. From 2014 on a gradual scale, ERDF may, as other network operators do, use the ARENH programme to buy its losses for around 80% of its loss purchases.

Technical characteristics: at 31 December 2012, the distribution network for which EDF is the concession holder (see section 6.2.2.2.2 "Distribution activities", subsection "Concessions") comprises approximately:

- 618,000km of 20,000V high-voltage lines (HVA);
- 697,000km of 400V low-voltage lines (LV);
- 2,240 HVB/HVA source posts; and
- 758,000 HVA/LV transformers.

Upstream, network boundaries are generally the source substation, the operational portion of which is ERDF property, which ensures the interface between the transmission and distribution networks. In some cases, the substation connected to generation installations in turn directly connected to the distribution network and, downstream, the circuit breaker installed at the customer's premises, fall within the scope of the concession.

#### 6.2.2.2.1 Organisation of ERDF

Since 1 January 2008, the EDF Group's distribution activity in France, in accordance with the legal framework, has been almost exclusively provided by ERDF, a French public limited company (*société anonyme*) with an Executive Board and Supervisory Board responsible for managing the public electricity distribution network.

1. In particular, the compensation of directors and employees must be based on indicators specific to RTE. They cannot hold any interest in or receive any financial benefit from the companies forming the VIE, except, for employees, holdings as of 1 June 2011, in respect of bonus share plans and profit-sharing or incentive agreements.

# 6 | Overview of activities

## Presentation of EDF group's business in France

In accordance with Directive 2003/54/EC including principles from Directive 2009/72/EC of 13 July 2009, which stipulates that when the distribution network operator is part of a vertically integrated entity, its organisation and decision-making must be legally independent of other activities unrelated to distribution, EDF and Gaz de France, today GDF Suez, opted to spin off their systems operators; their two subsidiaries, ERDF and Gaz réseau Distribution France ("GrDF"), share a common service pursuant to the legal framework (see section 6.2.2.2.4 ("Shared service and international")).

Pursuant to the law of 9 August 2004, a partial asset transfer agreement allowed EDF to transfer the assets and liabilities related to its electricity distribution activity (such as the rights, authorisations, obligations and contracts related to managing its public electricity distribution network) to ERDF.

The ERDF Supervisory Board is made up of 15 members, of which eight are appointed by the Shareholders' Meeting, five are employee representatives elected according to French law No. 83-675 of 26 July 1983 relating to the democratisation of the public sector, and two are French government representatives. The ERDF Executive Board includes five members since January 2013 (against two members in 2012) who exercise their functions under the control of the Supervisory Board.

### ERDF's role in France

ERDF operates the public electricity distribution network according to conditions set in the concession bid specifications (see section 6.2.2.2.2 ("Distribution activities" – "Concessions")), and provides other public services assigned by French law. To accomplish this mission, ERDF:

- draws up and implements operating, investment and expansion policies for its electricity distribution network;
- ensures user connection and access to these networks in an objective, transparent and non-discriminatory manner, and also provides interconnections with other networks;
- gives users the information needed to access its networks efficiently (information protected by regulations or law excepted);
- handles relations with energy regulatory bodies (e.g. the French Energy Ministry, the French Energy Regulatory Commission, and government

ERDF's investments have changed as follows:

Gross investments (in € millions)	2010	2011	2012
User and street connections	1,206	1,309	1,380
Intentional investments (reinforcement, security, quality, IS, etc.)	1,354	1,512	1,689
<b>ERDF's total investments</b>	<b>2,560</b>	<b>2,821</b>	<b>3,069</b>
Facilities handovers by third parties and local authorities <sup>(1)</sup>	940	932	878
<b>TOTAL NETWORK INVESTMENTS</b>	<b>3,500</b>	<b>3,753</b>	<b>3,947</b>

(1) After deducting PCT and Article 8.

The additional resources committed were allocated to ensuring network security, safety, environmental protection and quality of transmission, fields in which customers' and local authorities' expectations are particularly high.

Increased investment allows ERDF to pursue asset replacement programmes, namely:

- a "climate contingencies" action plan was developed and launched in 2006 in accordance with the Public Service Contract (see section 6.5.2 ("Public Service in France")), based on a comprehensive assessment of the network's potential weaknesses in relation to climate events. The plan was completed by a "life extension" programme for the overhead high-voltage network in the amount of €43 million, with the provision

of remote switching equipment allowing customers' connections to be restored quickly in case of power cuts;

- handles relations with local authorities;
- negotiates, signs and manages concession contracts;
- operates, repairs and maintains electricity distribution networks;
- oversees the design and construction of network infrastructure, and provides project management for these networks;
- provides metering for users connected to these networks, in particular the supply, installation, checking, maintenance and replacement of meters, as well as data management and all tasks relating to the above activities;
- provides services to the LDCs, distributors and organising authorities referred to in III and IV respectively of Article L. 2224-31 of the French Local Authority Code;
- and, more generally, engages in industrial, commercial, financial or property transactions relating to the above tasks.

### 6.2.2.2.2 Distribution activities

ERDF operates through the following businesses: ensuring the management of concession assets, managing and maintaining the network to ensure continuity of supply, carrying out work on the network (in particular, the work of connecting, strengthening and renewing the network), providing access to the network for all users within the framework of existing contractual arrangements and managing meter units, acquiring, processing and transmitting network user consumption data.

### Change in investments

In 2012, ERDF invested €3.1 billion, of which €1 billion allocated chiefly to the connection of new customers and producers. The continued investment dating back to 2008 resulted in an increase of €756 million in investment on the distribution network between 2009 and 2012. In addition, licensing authorities invested €878 million in 2012. In total, €3.9 billion were invested on distribution networks in mainland France in 2012.

of remote switching equipment allowing customers' connections to be restored quickly in case of power cuts;

- the replacement of old underground HVA and LV networks in major cities has also begun, with more than 1,100km of underground HV networks replaced in 2012;
- a programme of substation modernisation (checks of digital command equipment, replacement of switchgear, etc.)

In addition to its investments, ERDF continues to increase budgets allocated to preventive maintenance of networks, especially for pruning.

(in € millions)	2010	2011	2012
Preventive maintenance budget	230	242	264

## Departmental conferences

Investment programmes are broken down every year on a regional basis during departmental conferences organised and chaired by the Prefect. These departmental conferences, established by the so-called NOME law of 7 December 2010, aim to strengthen dialogue between contractors who invest in the public distribution network in order to achieve greater efficiency in the capital expenditure devoted to the safety and quality of electrical power.

## The Public Service Contract, and environmental and aesthetic concerns

In order to comply with the Public Service Contract's objectives as well as with environmental and aesthetic objectives, ERDF has also undertaken to bury 90% of new high-voltage lines and to apply "discreet techniques" to install two-thirds of new low-voltage lines (LV). ERDF is not seeking to bury its entire network. A buried network would effectively be as vulnerable to outage risks as an overhead one: it may be subject to external shocks (heat waves, floods, construction, etc.), and the time required to locate incidents and re-establish the customers' supply is generally longer than in the case of an overhead network.

In 2012, ERDF built over 98% of new medium-voltage lines using the underground technique, and over 79.6% of new low-voltage lines using the underground or discrete technique (twisted cable). It thus exceeded its commitment to the French government to reduce the visual impact of the networks established under its contractorship. Also, as part of its climate contingencies plan, ERDF laid more than 5,100km of overhead high-voltage lines (HVA) in 2012.

## Quality of service

Quality of service is a major objective for ERDF. In 2012, the average outage time excluding transmission incidents and exceptional events was 75 minutes, confirming the improvement undertaken since 2010. Quality of service is also reflected by maintaining steady voltage, as close as possible to the value set by regulation, and by minimising the number of power cuts.

Decree No. 2007-1826 of 24 December 2007 sets out the quality of service thresholds to be respected by distribution network operators. This decree aims to ensure over the long term a minimum level of quality for users structurally subjected to significantly more unfavourable power conditions than the vast majority of French users. It mainly concerns rural areas. It dovetails with provisions adopted by the regulator in the Tariffs for Using the Public Electricity transmission and distribution networks ("TURPE") to encourage network operators to maintain and improve the trend in average quality. The thresholds are specified by order of 24 December 2007, as amended by order of 18 February 2010, updated after a trial period designed to set certain mechanisms. Regarding the quality of voltage, over 99% of customers in 2012 were considered "well supplied" under existing regulations.

In order to cope with major incidents, ERDF established a special rapid-response task force ("FIRE") that can send at any time, to any region, teams from other regions in order to restore electricity to customers as quickly as possible.

To insure the overhead distribution system against the consequences of large-scale "storms", ERDF concluded a contract with Natixis on 11 August 2011,

for a period of five years. With capacity of up to €150 million, this cat-bond type mechanism triggers compensation in the event of damage based on a parametric index built on wind speed. This coverage was reinforced by a contract signed on 16 December 2011 with Swiss Re, bringing the total coverage to €230 million.

## Renewable energy development

Within the scope of ERDF, the number of connections made to photovoltaic generation facilities again increased: as of end-2012, 3,126MW of photovoltaic facilities were connected (compared with 2,321MW as of end-2011), representing some 262,850 facilities (229,000 were connected in 2011). The development of wind-farm generation connected to the public distribution network also continued, with over 6,820MW connected as of end-2012.

As of end-2012, ERDF had connected total photovoltaic and wind generation capacity of around 10GW, breaking down as 3.1GW of solar power plants and 6.8GW of wind generation. This generation is rounded out by other types of power, including "established" hydropower (1.4GW) and cogeneration plants (1.8GW). In total, ERDF had connected an installed base of approximately 14.6GW as of end-2012. Such generation is no longer marginal; in 2012, it accounted for approximately 8% of the energy managed within ERDF's scope.

## Electricity market

The French market for electricity supply has been open on a competitive basis to all customers since 1 July 2007.

22 electricity suppliers operate in the French market. They have signed a contract with ERDF, defining terms of operation between the supplier and the distributor when the customer subscribes to a single contract encompassing electricity supply and delivery.

## Concessions

ERDF and EDF manage 665 concessions covering approximately 95% of the population.

In France, public electricity distribution is generally undertaken in connection with concession contracts. The licensing authorities own the distribution networks for the portion corresponding to return property<sup>1</sup>. Concession contracts are generally entered into for a period of between 20 and 30 years. The average end date of active concession agreements is 2024.

The development and operation of public electricity transmission and distribution systems (rational coverage by public distribution, connection and access systems under non-discriminatory conditions) is entrusted, pursuant to the French Energy Code (Article L. 121-4), to ERDF, to EDF in areas not connected to the mainland grid and to LDCs in their exclusive service areas.

Pursuant to Article L. 334-3 of the French Energy Code, concession contracts in progress are deemed to be signed jointly by the licensing authority (local authority or cooperative public establishment), EDF (or the territorially competent LDC) for the portion supplied at regulated rates, and by ERDF (or the territorially competent LDC) for the networks portion. At the time of their renewal or modification, concession contracts are co-signed according to these terms.

1. Return property is that which is essential to the exercise of the licensed service. Such property is deemed from the outset to belong to the licensing authority. The concession contract provides for its mandatory return to the licensing authority at the end of the concession.

## The concession contract model

A framework of concession contract and specifications was adopted (with adjustments, depending on whether the contract was entered into with an urban municipality or a syndicate of municipalities) in June 1992 following negotiations between EDF and the National Federation of Licensors and Local Utilities (FNCCR) and was validated by the public authorities. It was updated in July 2007 to account for new French legislation and regulations (see section 6.5.5 "Public electricity distribution concessions").

The main provisions of the concession specifications cover the following points:

- the purpose and scope of the concession: the licensing authority guarantees to the concession holder the exclusive right to operate the public service missions of development and operation of the public electricity distribution network in a given area and supply at regulated sales tariffs. The concession holder is responsible for the operation of the service, and operates it at its own risk; It collects from users a tariff compensating it for the obligations imposed upon it;
- the payment of royalties by the concession holder to the licensor;
- the obligation for the concession holder to perform industrial depreciation and constitute renewal provisions taking into account the cost of replacing facilities needing to be renewed;
- the rights and obligations of the parties in case of renewal of the concession;
- the rights and obligations of the parties in the event of non-renewal of the concession (or its early termination) should continued service no longer be of interest as a result of economic or technical circumstances of a permanent nature, or because of scientific progress;
- verification of the correct fulfilment of the public service mission set by the licensing authority in the concession specifications: this verification is exercised by an agent designated by the licensing authority and separate from the public distribution system operator.

Additionally, as part of the implementation of the French Solidarity and Urban Renewal ("SRU") and Town Planning and Housing ("UH") acts, ERDF and FNCCR signed an agreement on 26 June 2009, called PCT, organising payment to licensors of the delivery tariff fee for financing a connection when the licensors manage the project. This agreement was renewed on 18 July 2012.

Network project management (the contractor is responsible for the organisation, implementation and financing of the work) is determined in accordance with the terms set out in each of the specifications, generally as follows:

- with respect to connection (network extensions and creation of connections) and facilities modification (network improvements as a result of an increase in electricity demand or to improve service quality), ERDF and the licensor share the contracting of work by connection type (consumers) in municipalities that are part of the rural electrification networks (i.e. those where the licensor, who is also the main contractor, can benefit from grants from FACE). In urban networks, ERDF is generally responsible for contracting the work;
- ERDF is the main contractor for maintenance and renewal work (maintenance, pruning, renewal, displacement and compliance);
- the licensor is the main contractor for integrating existing installations into the environment (burying work, improvement of aesthetics, etc.).

## Main fees and contributions

The contracts provide for the payment of fees by the concession holder to the licensing authority.

In compensation for the funding provided by the licensing authority for the facilities it manages and which are included in the concession, for the authority's own share of works for which the concession holder is the contractor, or for any expenses incurred by the licensing authority for the public service covered by the concession, ERDF pays a fee to the concession authority broken down via its calculation methods as an R1 (operational) fee and an R2 (investment) fee.

As a network operator, ERDF must pay charges for use of public land by electricity facilities. Pursuant to a decree of 26 March 2002, charges paid to local authorities are capped according to their population. They are paid to municipalities or to certain local authority groups, as well as to departments.

ERDF, like local distribution companies, pays into an electricity depreciation and amortisation expense fund ("FACE") based on the number of kilowatt-hours delivered. FACE redistributes the collected funds to the licensing authorities to fund their rural network electrification expenditure.

ERDF and local distribution companies also pay into an electricity tariff balancing fund ("FPE"), which splits the equalisation charges among the distribution network operators. Equalisation charges relate to the obligation to ensure that all customers across the domestic market benefit from the same electricity delivery tariff.

### 6.2.2.2.3 Institutional and legislative news

The regulatory framework aimed at reinforcing safety work in the vicinity of networks was used in formulating the so-called "Grenelle 2" law of 12 July 2010. The new system came into force on 1 July 2012, following the publication of the order on 15 February 2012. The reform focuses mainly on the location of existing underground networks prior to the completion of the work and a rebalancing of responsibilities between systems operators, owners and contractors. Mapping obligations imposed on operators have become more stringent, requiring positional accuracy of 50cm. Further investigation (excavation) is required for all work in the vicinity of networks whose location is not known with the required accuracy.

The regional renewable energy framework includes a chapter on the grid with the publication of the decree of 20 April 2012 on regional master plans for connecting renewable energy to the grid. These master plans provide the definition by system operators of the infrastructure needed to meet the objectives of the Regional Master Plans on Climate, Air and Energy (SRCAE), and the sharing of renewable energy costs between producers. The implementation of these master plans is in progress, and four had been published as of end-2012 (see also section 6.5 ("Regulatory and Legislative Environment")).

### 6.2.2.2.4 Shared service and international

#### Relations between ERDF and GRDF within the common service

Pursuant to Directive 2009/72/EC of 13 July 2009, the principle adopted in 2008 by EDF and Gaz de France, now GDF Suez, was that of the spin-off of their network operators and shared services department in accordance with the legal framework.

Pursuant to Article L. 111-71 of the French Energy Code, these activities are based on shared service with ERDF and Gaz réseau Distribution France (GrDF), a company created on 1 January 2008, and wholly owned by GDF Suez, which is responsible for the management of the public gas distribution network. Each company nevertheless manages the portfolio of clients independently.

In 2012, ERDF and GrDF took over 91.6 million meter readings and performed approximately 11.5 million customer visits.



## Organisation of the shared service

ERDF and GrDF's shared service is not an incorporated company. Its work, in the distribution of electricity and gas, includes construction and maintenance of electricity and gas networks, project management, network operation and management, and metering activities.

At 31 December 2012, ERDF employed 38,211 people<sup>1</sup> (see section 17.1.1 ("Group workforce")).

On 18 April 2005, EDF and Gaz de France, now GDF Suez, entered an agreement specifically setting out the shared service competencies and sharing of costs and revenue resulting from its activity<sup>2</sup>. This agreement, after the necessary adjustments, was transferred in 2008 to ERDF and GrDF, under the spin-off of the electricity distribution of EDF and GDF Suez. This agreement also specifies how the joint service will be governed (organised, monitored, and modified). Within this scope, organisation is being clarified in three areas: connection, territorial representation and delivery. Each company is free to develop its own activities within the shared service. In cases where one company's decisions, especially financial, are liable to impact the other's within the shared service, a study must be conducted. Any ensuing prejudice is compensated through the payment of financial compensation and/or the amendment of the agreement made between the two companies. Decisions regarding common activities are made together by the two companies. As such, neither ERDF nor GrDF can impose a decision without the agreement of the other party.

The agreement was made for an unlimited duration and may be terminated at any time with 18 months' notice, during which the parties must undertake to negotiate a new agreement. If a new agreement is not entered into at the end of this period, the parties will refer the issue to the mutual dispute resolution procedures, before any referral to the courts. The contract also includes provisions requiring the parties to negotiate in good faith, particularly in the event of a change in the applicable law or if new circumstances affect the economic aspects of the contract.

In November 2011, ERDF and GrDF signed a Memorandum of Understanding outlining each distributor's vision of the target organisation of the shared service. This led to change in the organisation of activities and a modification of the governance agreement between the two distributors.

## International

Through its subsidiary ERDF-I, ERDF continued to expand its international business in 2012, offering its customers its know-how, expertise and services.

Major events in 2012 included:

- the creation of a wholly owned subsidiary of ERDF-I in Russia, ERDF Vostok, on 16 January 2012, and the entry into force of the management contract for TRK, the manager of electricity distribution in Tomsk, in Russia, on 1 March 2012;
- creation of a branch of ERDF-I in Lebanon, ERDF Mashreq, on 23 May 2012, and the signing of two performance contracts with customers BUS and KVA on 12 March and 1 June 2012, respectively;
- in China: implementation of the cooperation agreement with the State Grid Corporation of China (SGCC) by the signing of two service contracts; signing on 27 February 2012 of a cooperation agreement with China Southern Power Grid (CSPG); signing of a Memorandum of Understanding with SPG, the leading electricity distributor in China's Shaanxi Province, on 29 May 2012, following initial contacts in 2011.

## 6.2.2.2.5 Future challenges (replacement, development and smart meters)

### Smart grids and communicative meters

Because it is responsible for the continuity of the electricity distribution public service, ERDF continuously invests in order to develop, modernise, automate and secure the electrical grid. Aligning the grid with society's new needs is a major strategic challenge. To this end, ERDF has developed the Linky system, based on a new generation of smart meters, known as "communicative meters". The Linky system represents the founding stone of the smart grid. After a successful experiment approved by the government, nearly 300,000 Linky meters are operating in Lyon and Touraine. ERDF is now preparing to roll out the system across France. This will consist of equipping 35 million French homes free of charge, with a total investment of €4.5 billion until 2020.

At the initiative of the Ministry for Ecology, Sustainable Development and Energy, a working group of all stakeholders (suppliers, manufacturers, consumer associations, licensors, regulator, etc.) was formed on 16 November 2012 to allow collective appropriation of the project's four key points: response to consumer expectations, the system's load-management capacity, the proposed rollout strategy and the funding arrangements. This shared work will enable the project to get underway in 2013, with operations launched in the field in the subsequent 18 to 24 months, the time needed for industrial suppliers to respond to calls for tenders and produce equipment.

Linky is a valuable tool for all consumers, as it will allow:

- billing based on actual consumption;
- remote performance of most operations in less than 24 hours without the presence of the customer (surveys, power changes, start of service, etc.);
- shorter response times in case of an incident;
- easier integration of new applications (electric vehicles) and renewable energy;
- secure access via the internet to information allowing customers to understand their use;
- a control device to manage home consumption;
- a simple and single tool to help in the development of interruptibility.

### Foster the energy transition

Simultaneously, ERDF is currently conducting large-scale tests of the following units, which will give consumers and businesses a profoundly modernised grid. This research and experimentation work bears on the exploitation of low- and medium-voltage grids, the integration of RES (renewable energy sources) and electric vehicles, storage management, maintenance of electrical voltage, etc. ERDF is managing or supporting 15 test units in France and Europe with various partners, including industry, SMEs, start-ups and universities. Its challenge is to foster the energy transition by modernising grids at the lowest cost to society. Thanks to new technologies, more granular and faster control is possible, based on a better understanding of consumption, production and grid status. This "intelligence" avoids oversized investments on peak demand while ensuring the reliability of the network, in accordance with the dual objective of public service entrusted to ERDF, namely performance and security.

1. For the electricity business out of a total of 48,813 as of end 2012.

2. The ERDF and GrDF agreement defines the rules on sharing common revenue stemming from the shared service and codes applied for distribution between ERDF and GrDF. The principal code, used by default in the absence of a specific contractual code, is the "network user" code, calculated from the totality of electricity and gas delivery points, regardless of the customer category. Other codes, whose nature is tied to their related activities, are applied.



## 6.2.2.3 Island Energy Systems

Island Energy Systems ("SEI") comprise the electricity networks operated by EDF that are not interconnected or only connected to a very small extent to the continent: mainly Corsica, the French overseas departments and overseas municipalities of Saint Barthélemy, Saint Martin, and Saint Pierre-et-Miquelon.

All these territories are known as "non-interconnected areas to the continental mainland network", as outlined in Article L. 121-3 of the French Energy Code. They share the following characteristics:

- they benefit from tariff equalisation with continental metropolitan France;
- the small size of their electricity networks and the lack or insignificance of their interconnection to a continental network means that generation costs are structurally far higher than those in mainland France and, for this reason, much higher than the portion reflected in the tariffs;

The table below gives the main specifications of the Island Energy Systems at the end of December 2012.

	At 31 December 2012	
	Total	of which Corsica
Number of EDF employees <sup>(1)</sup>	3,295	728
Number of clients/customers	1,064,349	237,573
Network length (in km)	34,167	11,127
Installed capacity of the EDF fleet (in MW)	1,924	463
of which hydropower fleet and other renewable energy sources	400	142
of which fossil-fired plants	1,524	321
Electricity generation (in GWh)		
EDF generation <sup>(1)</sup>	5,393	1,285
of which hydropower	1,310	285
Energy purchases from third parties	4,141	912
of which REN, including bagasse	1,121	189
of which others	3,020	723
<b>TOTAL ENERGY GENERATED BY EDF AND PURCHASED FROM THIRD PARTIES</b>	<b>9,534</b>	<b>2,197</b>

(1) Data including EDF Production Énergétique Insulaire (PEI) a 100% owned subsidiary in charge of renewing the fossil-fired plants in Corsica and French islands.

In these networks, given the existing imbalance between the MWh generation cost and the sale price at the equalised tariff, EDF's sales activities consist of spearheading energy efficiency actions, either alone or in partnership with ADEME and local institutions.

However, most of the Island territories are experiencing significant growth in their electricity consumption (high rate of population growth and/or late technological developments in household appliance adoption). This increase in demand must be met by the creation of new-generation plants, which are decided upon by the Minister for Industry within the scope of the Multi-Year Investment Programme ("PPI"), either by means of calls for tender or by authorising projects developed by private operators. The operators' interest, including EDF, in investing in SEI generation was strengthened by an order taken by the Minister for Industry on 23 March 2006 setting at 11% the nominal remuneration rate before tax of capital expenditures related to production investments made in Corsica, overseas departments, St-Pierre-et-Miquelon and Mayotte.

At the end of 2012, the French Energy Code was modified in respect of the compensation of energy efficiency measures, electricity storage costs and the cost of electricity imports from neighbouring countries under an amendment tabled during the debate on the France's third amended 2012 Budget Act (Article 60), promulgated on 29 December 2012. This compensation can only be made within the limits of production cost overruns that these actions help avoid. A decree by the Council of State and an order by the Minister for Energy are planned to govern its implementation.

- the obligation to entrust transmission and distribution to a separate legal entity from the one generating and supplying the electricity does not apply.

This situation results in the lawmaker considering additional SEI output costs to be a public service charge and therefore reimbursable through the Contribution to the Public Electricity Service (CSPE) (see section 6.5.2 ("Public service in France")).

EDF's organisation in each of these territories is therefore based on maintaining an integrated structure guaranteeing the majority of output, and all the management functions for supply-demand balance, network operator functions (HVB, HVA and LV) and supplier functions.

In these territories, EDF is the main actor in terms of electricity generation.

## Developments and outlook

### Investments designed to modernise and reinforce the electricity generation fleet with guaranteed capacity

The Multi-Year Electricity Generation Investment Programme has set an objective of implementing electricity generation at guaranteed capacity for Corsica and the French overseas departments of 1,166MW by 2020. This programme includes almost complete refurbishment of existing diesel-fuelled power plants.

On the basis of the strategy adopted, namely to remain the leading actor in each of these territories as regards installed capacity, the EDF Group has taken on the project of renewing its main power plants. Construction sites on four of these diesel-fuelled power plants have been started for a total capacity of nearly 740MW: Port-Est in Reunion Island, Bellefontaine B in Martinique, Pointe-Jarry in Guadeloupe and Lucciana B in Corsica. These new-generation facilities will enable the Group to deliver better industrial and environmental performances, and will contribute to meeting part of the emerging electricity requirements in these territories. The first two engines of the Port-Est plant in Reunion were commissioned in late 2012.

The refurbishment of the Saint-Pierre-et-Miquelon plant, with a capacity of 21MW, is also underway, as is extension work on the Saint-Barthélemy plant (two new engines).

The EDF Group also began developing two hydropower projects to extend the 14MW Rivière de l'Est facility in Reunion Island, which was commissioned in 2010, and construction of the Rizzanese facility in Corsica with 55MW of power, the first group of which was joined to the grid on 12 December 2012.

EDF invested €611 million in electricity generation in 2012, and plans to invest €380 million in 2013.

## Electricity network investments

Continued growth in electricity consumption in these areas, despite energy efficiency measures and the development of renewable energies, has led the EDF Group to further strengthen its electricity networks. Because of the abundance of natural parks in Corsica and the French overseas departments, some of the new high-voltage connections will be laid using underground and underwater techniques.

EDF invested €176 million in its networks in 2012 and plans to invest a further €170 million in 2013.

## Involvement in projects intended to better integrate renewable energies into the electricity generation mix and optimise electricity system management

The EDF Group supports the emergence and development of different ways of generating power from renewable energies that are tailored to Island Energy systems. The ways of choice are those that guarantee abundant, sustainable energy at competitive generation costs, making them credible alternatives to thermal generation: biomass, geothermal, marine and river energy, waste recycling and biogas. The use of LNG as a substitute to fuel oil is currently being researched.

EDF is also helping to develop the technical capacity to use intermittent renewable energies in island energy systems (developing forecasting tools with other producers and universities, commissioning a 1MW battery in Reunion Island, which is the first of this capacity in Europe, coupling photovoltaic generation and storage capacity) and participating in smart grid research projects in partnership with other producers, research laboratories and the French Agency for Environment and Energy Management (ADEME).

A plan to build a marine energy transfer pumping station (marine STEP of 50MW and 1GWh electricity storage capacity) in Guadeloupe was submitted in response to ADEME's call for expressions of interest regarding mass electricity storage.

The EDF Group's R&D expertise was called on for all these projects.

### 6.2.2.4 Tariffs for Using the Public Electricity transmission and distribution Networks ("TURPE")

TURPE are set in order to cover:

- the costs of transmission and distribution activities, while integrating the generation targets set by the regulator;
- financial compensation equal to the income of the regulated asset base, estimated at €11.3 billion at 1 January 2012 for transmission and €34 billion for distribution, and a fixed rate of remuneration corresponding to a nominal rate before tax of 7.25% for the tariff period in force (TURPE 3).

Pursuant to Article L. 341-3 of the French Energy Code, the TURPE are the subject of reasoned decisions of the French Energy Regulation Commission ("CRE"). Current TURPE (TURPE 3), which were approved by the ministerial

decision of 5 June 2009 (in accordance with the then institutional framework, which provided for the tariff proposal submitted by the CRE to be jointly approved by the ministers in charge of energy and the economy), published in France's *Journal Officiel* on 19 June 2009, came into force on 1 August 2009. The CRE drew up its proposal to enable the network operators to cover their costs over a period of four years as of 2009. The CRE's proposal provided for an increase in their costs when a 2% rise in the tariff for using the public electricity transmission and a 3% rise in the tariff for using the public electricity distribution came into force. Then, from 2010 to 2012, the tariff schedule had to be adjusted according to the rate of inflation plus 0.4% for the transmission network and 1.3% for the distribution network.

In addition, the CRE has set up a mechanism to compensate for the effects on the network operators' income and expenses of external factors that are difficult to predict and beyond the control of these network operators. This income and expenses adjustment account ("CRCP") takes off the balance sheet, on previously identified items, all or part of any excess or shortfall experienced by the network operator cleared by decreasing or increasing expenses to be recovered through the public electricity network tariffs over the following years. The annual rise in TURPE also takes into account this factor through clearance of CRCP, the absolute value of which may not exceed 2%. The application of these principles led to a transmission usage tariff increase of 2.79% and a distribution network usage tariff increase of 1.80% on 1 August 2012. Furthermore, in application of an indexation formula of its own, the catalogue price of ERDF's services increased by 1.9% in 1 September 2011 and by 2.5% in 1 September 2012.

The introduction of a tariff period of four years ensures better visibility for transmission system operators and distributors in respect of change in their revenues. This period also facilitates the implementation of measures allowing them to control costs and improve quality.

On this basis, tariff revenues were approximately €4 billion for ERDF's transmission network and approximately €12.2 billion for its distribution network in 2012.

Hoping that the network operators will improve technical and economic operational efficiency during the tariff period while ensuring compliance with their public service mission, the CRE adopted incentives to control costs and improve quality. To this end, the CRE has accepted the productivity gain levels on controllable operating expenses proposed by the network operator. If a network operator makes additional efforts during the tariff period, the additional load released will be shared between the network operator and end users. The CRE has also adopted a specific measure aiming to encourage network operators to control the costs associated with the compensation of network losses.

These provisions are accompanied by a regulatory scheme encouraging transmission and distribution network operators to improve the quality offered to users, in terms of both power supply and quality of service. This quality incentive scheme in particular helps to ensure that network operators do not make productivity gains at the expense of quality levels.

See section 6.5.3.2 ("French legislation: Energy Code") for the transportation and distribution of natural gas (law No. 2003-8 of 3 January 2003).

On 28 November 2012, the Council of State annulled the government decision of 2009 relative to the price of transport to networks (TURPE 3). It asked the CRE to make a proposal, and the relevant ministers to approve, a new tariff for network use, for the period from 1 August 2009, with delayed effect as of 1 June 2013.

On 5 February 2013, the CRE has conducted a public consultation on «the development of tariffs for the use of a public electricity network in MV and LV voltage following the cancellation by the Conseil d'Etat of the third tariffs for Using the Public Electricity distribution Network (TURPE 3).

## 6.3 Presentation of the EDF Group's international business

The EDF Group is positioned as an energy leader, with a priority aim of investing for sustainable and profitable industrial growth, based on the development of skills and the promotion of our technical expertise. The Group intends to continue to strengthen its international businesses as a complement to its activities in France.

The international activities of the EDF Group are an operational expression of the Group's strategic directions (see section 6.1 ("Strategy")); these strategies involve strengthening European positions, and the international rollout of nuclear activities and projects and other key projects.

The table below shows the installed capacities and outputs of the EDF Group's international operations at the end of 2012<sup>1</sup>:

	Installed capacity <sup>(1)</sup>		Output <sup>(1)</sup>	
	MW	%	GWh	%
Nuclear (excluding 100MW drawing rights on Chooz B)	11,603	35	80,575	49
Thermal	19,202	58	75,076	46
Hydropower	1,442	4	4,194	3
Other renewables	837	3	3,182	2
<b>TOTAL</b>	<b>33,084</b>	<b>100</b>	<b>163,027</b>	<b>100</b>

(1) without EDF Énergies Nouvelles international data amounting to 3,600MW and 7,280GWh respectively.

### European positions

The EDF Group has consolidated its European presence, the mature market that forms the foundation for its industrial presence.

Group activity in Europe is based upon a will to contribute to building a single market for both electricity and gas, encouraging the emergence of new technologies and innovative solutions that are customised to environmental, social and economic challenges, and lastly to respect natural and human resources, and the wishes of local stakeholders in their concerns over energy issues and associated services.

The principal events of the year illustrating this strategy were:

- in the UK: pursuing studies and investments to diversify local generating facilities;
- in Italy: EDF took exclusive control of Edison, thus reinforcing the Group's gas strategy and consolidating its position as pivotal player in Italy;
- in Poland: purchase of stakes in the subsidiaries owned by EnBW.

### The Group's ambitions in Europe

The EDF Group aims to consolidate the coherent industrial Group it has in Europe through organic growth and realising synergies at Group level. It will review any new opportunity of profitable development in Europe, which is its core market.

In addition, the Group intends to continue building its gas positions that are necessary to its ambition of becoming an active provider in both the gas and electricity sectors in Europe in order to secure provision of a multi-energy offer for its customers and to ensure competitive supply of the Group's electricity generation means through the use of gas.

The Group is also realising operational synergies among its various entities in France and Europe through the following actions:

- improving operational performance by sharing best practices observed within the Group;

- using the opportunity of the various subsidiaries' generation assets construction projects in order to standardise the design and to group the orders placed with equipment manufacturers;
- coordinating gas supplies and investments in order to further the Group's ambitions in the gas market; and
- developing upstream-downstream optimisation at a European level.

### International nuclear

As the world's largest nuclear generator, EDF has major technical assets (in operations and engineering) and solid experience in constructing and operating nuclear plants in France (58 pressurised water reactors), the United Kingdom (15 reactors) and the United States (through Constellation Energy Nuclear Group, LLC and its subsidiaries, "CENG"), which will allow it to be a major player in the revival of nuclear power internationally. In China, EDF and its partner CGNPC are building two EPR units in Taishan.

In the UK, through its subsidiary EDF Energy, EDF plans to build up to four EPR units, with an initial project of two units on the site of Hinkley Point. Despite the Fukushima accident in March 2011, some countries and electricity utilities have announced or confirmed their intention to launch or reactivate nuclear projects. This development is motivated by the search for energy independence combined with growing awareness of the environmental impact of the use of fossil fuels. It has led to the emergence of several models and new industrial partnerships.

EDF has set four criteria for its involvement in international nuclear projects. Priority targets are countries that:

- have chosen nuclear power in the short term;
- are known to EDF and where EDF is welcome;
- are learning the lessons from the Fukushima accident, specifically by placing at the core of their project the role of the future operator and safety management;
- offer favourable conditions to investors in nuclear energy (legislative framework, waste management, public opinion, etc.).

1. The figures shown reflect the consolidation method used for the entities.

EDF has thus identified a number of geographical opportunities in addition to China, focusing as a priority on the United Kingdom. EDF is also examining other opportunities both in Europe and other areas (see section 6.1.3 ("Strategic areas to 2020")).

In each of these countries, EDF adapts to the institutional context and the industrial and economic environment; the resulting organisational models may be different each time.

The EPR programme underway in France and China and planned for the United Kingdom is currently the benchmark programme of the Group.

However, it appears essential to strengthen the offer, within the framework of the guidelines laid down by the Nuclear Policy Council on 21 February 2011 and confirmed by the Nuclear Policy Council on 28 September 2012. On 19 October 2012, EDF, AREVA and CGNPC thus signed a cooperation agreement with a view to considering the development of a new third-generation, intermediate-size reactor (1,000-1,100MW). In cooperation with AREVA, EDF is also focusing on optimising EPR design as well as taking into account feedback received from EPRs under construction.

EDF is thus seeking to expand and develop its reactor and services offer for both the international markets.

## 6.3.1 United Kingdom

EDF Group activity in the United Kingdom ("UK") is represented by EDF Energy. The Group is active in oil and gas exploration production with EDF Production UK, in the North sea. (see section 6.4.2.2.3 ("Exploration – Production ("E&P")").

### 6.3.1.1 EDF Energy and the UK market

EDF Energy is one of the UK's largest energy companies, employing around 15,000 people at locations throughout the UK. In 2012, it retained its position as the largest generator of electricity (in TWh produced) and the largest generator of low carbon electricity<sup>1</sup> in the UK. Based on the most recent data<sup>2</sup>, EDF Energy also retained its position from the previous year as the number one supplier of electricity to non-domestic customers (as measured in TWh sold<sup>3</sup>) and remained the fifth largest supplier to domestic gas and electricity customers (measured in numbers of customer accounts<sup>4</sup>). Overall, EDF Energy is the leading electricity supplier in the UK, (excluding Northern Ireland).

At the date of filing this reference document, the final figures on the total production and consumption of gas and electricity in the UK in 2012 were not yet published by the Department of Energy and Climate Change. For information about price movements and electricity consumption in the United Kingdom, see section 9.2.1 ("Economic environment") of this reference document.

EDF Energy's main competitors in the generation sector in the UK are: Centrica, E. On UK, GDF Suez Energy International, RWE npower, Scottish Power and Scottish and Southern Energy ("SSE"). EDF Energy's main competitors in both the gas and electricity supply markets are British Gas ("Centrica"), SSE, RWE npower, E.ON UK and Scottish Power.

The high-voltage electricity transmission network is owned by National Grid in England and Wales, and by SSE and Scottish Power in Scotland. The UK transmission network is divided into regional areas managed by distribution network operators including UK Power Networks, Northern Powergrid, SSE, SP Energy Networks, Western Power Distribution and Electricity North West. The gas distribution network operators include National Grid, Scotia Gas Networks, Wales and West Utilities and Northern Gas Networks.

### 6.3.1.2 The strategy

EDF Energy operates in a complex market environment characterised by volatile commodity markets, high levels of competition and Government interventions to deliver energy policy objectives of energy security, decarbonisation and affordability. Notwithstanding the current economic downturn, demand for electricity is expected to return to growth in the long term as decarbonisation policies prompt fuel switching from gas and oil to low carbon electricity particularly in the heat and transport sectors.

EDF Energy seeks to add business value through continued operational excellence, achieving maximum value from its existing nuclear and coal assets, increasing downstream profitability based on a fair risk reward relationship with customers and by leading the revival of nuclear new build in the UK. The Group plans to build two to four new nuclear units in the UK: a twin at Hinkley Point in Somerset and a possible further twin at Sizewell in Suffolk (subject to ongoing studies). EDF Energy is working with the Government to agree a fair, balanced deal on revenue certainty via a Contract for difference ("CfD") to enable a final investment decision ("FID") for Hinkley Point C. The publication of the Energy Bill on 29 November 2012 and the Parliamentary scrutiny currently underway, demonstrates real momentum. However further work remains to be done to finalise transitional arrangements, an agreed strike price and detailed terms for Hinkley Point C. For further information see section 6.3.1.7.5 ("United Kingdom Legal Environment") of this reference document.

EDF group's existing nuclear power stations continue to provide the UK with safe and reliable low-carbon electricity, with the highest output in seven years achieved in 2012 at 60TWh. Lifetime extensions for our plant, where safe and commercially viable, allow the UK to continue to benefit from nuclear output until new low-carbon capacity can come online at scale, in addition to providing employment opportunities and allowing for the maintaining of skills in the UK nuclear industry. Subject to the necessary formal reviews and approvals, EDF Energy expects to achieve life extensions of an average of seven years across the AGR fleet (relative to the scheduled closure dates assumed in 2009) and of 20 years for Sizewell B. As a step towards realising this expectation, in December 2012, EDF Energy announced the decision to extend the lives of Hinkley Point B and Hunterston B stations by seven years. For further information see section 6.3.1.7.2 ("Nuclear Generation business unit") of this reference document.

Other important strategic actions include delivering the new 1,305MW West Burton B Combined Cycle Gas Turbine ("CCGT") power station and a fast cycle gas storage project, optimising the lifetime value of our coal generation capacity affected by the Large Combustion Plant Directive ("LCPD") and the Industrial Emissions Directive ("IED"), and maximising output for existing nuclear plants, and continued delivery of renewable generation projects.

1. Source: Elexon Reporting.

2. Source: Cornwall Energy Associates Business Sector – Electricity as at 31 October 2012.

3. According to the available data, excluding Northern Ireland.

4. Source: Cornwall Energy Associates Domestic Regional Survey as at 31 October 2012.



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Downstream, the focus is to improve the profitability of its customer business through controlled margin management, increased cost efficiency and transformation of key processes, supported by investment in people and information systems. In order to ensure customers a reliable and transparent service, EDF Energy has introduced customer commitments to deliver fair value, better service and simplicity to customers. Supported by the Feel Better Energy brand strategy and the innovative, nuclear-backed Blue product, progress is being made towards being seen as different, and reached the record number of household customer accounts last year at 5.5 million accounts, with about 1 million accounts having switched to the Blue product. Blue is also behind the ten-year deal to supply Network Rail with 3.2TWh of low carbon electricity p.a. EDF Energy's industry leading commitment is to help the most vulnerable customers and to ensure that they will automatically benefit from the cheapest available tariff, even if they have never switched. For further information see section 6.3.1.7.1 ("Energy Sourcing & Customer Supply") of this reference document.

Future financial success will be highly dependent on the returns achieved by existing and new nuclear plants, which are driven largely by plant availability and for existing capacity, wholesale market power price development. It is focused on improving the risk profile of the portfolio to take any value creation opportunities from its combined nuclear and flexible generation assets, participating in the creation of a fit-for-purpose regulatory framework and helping to set up a rigorous investment framework.

In order to achieve its strategic ambitions, developing and retaining high performing people remains core values. EDF Energy has continued to invest heavily in the training and development of its people across the business, including through its own Campus Project to deliver specialist training. To support its substantial investment plan in the UK, EDF Energy expects to recruit nearly 4,000 talented employees from 2012 to 2015, of which 1,335 were recruited in 2012.

### 6.3.1.3 Operational results

In 2012, EDF Energy supplied 51.6TWh (versus 52.8TWh in 2011) of electricity and 31.1TWh (versus 25.7TWh in 2011) of gas to residential and industrial & commercial customers. At the end of 2012, the Group had 5.8 million customer accounts (versus 5.8 million in 2011), mainly residential customers (5.5 million customer accounts), with 0.3 million customers from small & medium-sized enterprises and major business.

At 31 December 2012, eight nuclear power stations and two coal-fired power stations are operated and total generated 82.7TWh (72.1TWh in 2011) of electricity in the year, around one fifth of the UK's electricity.

In 2012 EDF Energy achieved our best ever safety performance with an about 12% reduction in total recordable incidents compared with 2011. The combined employee and contractor incident rate stands at 1.58 incidents per million hours worked.

The following table shows EDF Energy's key figures for the financial year ended 31 December 2012.

	31/12/2012	31/12/2011
Electricity supplied (GWh) <sup>(1)</sup>	51,595	52,819
Gas supplied (GWh)	31,092	25,747
Number of customer accounts (thousands)	5,768	5,790
<b>Total capacity (MW)</b>	<b>14,150</b>	<b>12,956</b>
Nuclear <sup>(2)</sup>	8,741	8,756
Coal <sup>(3)</sup>	3,987	4,020
Gas <sup>(4) (5)</sup>	1,306	82
Renewables <sup>(6)</sup>	116	98
<b>Total output (TWh)</b>	<b>83.4</b>	<b>72.4</b>
Nuclear <sup>(2)</sup>	60.0	55.8
Coal	22.8	16.3
Gas <sup>(4) (5)</sup>	0.3	0.03
Renewables <sup>(6)</sup>	0.4	0.2
Number of employees <sup>(7)</sup>	15,153	15,536
Total Recordable Incident Rate <sup>(8)</sup>	1.58	N/C

(1) Power supplied to final consumer including previous year metering cut-offs.

(2) The figures shown represent 100% of nuclear capacity and generation output, shared 80/20% by EDF Energy and Centrica.

(3) Capacity represents "transmission entry capacity".

(4) 2012 and 2011 figures exclude Sutton Bridge power station following implementation of the Hold Separate Arrangements (see section 6.3.1.7.4 ("Commitments under European Commission Merger Regulation ("ECMR")"). 2012 and 2011 figures relating to gas include a co-generation programmes capacity.

(5) This includes the new Combined Cycle Gas Turbine, West Burton B, that connected to the grid as part of its pre-commissioning activities.

(6) When EDF Energy holds more than 50% of assets, the capacities shown are 100% of the installed capacity and generation output.

(7) Includes staff on maternity leave.

(8) Total Recordable Incident Rate – Annual total combined number of Lost Time Incidents, fatalities, Restricted Work Injuries and Medical Treatment Injuries (excluding First Aid) / number of million hours worked. This covers all employees, agency and contractor staff. Excludes EDF Energy Renewables.

### 6.3.1.4 EDF Energy's Sustainability Commitments

Sustainability Commitments are as a set of targets focused on reducing carbon and waste, building a world-class culture, serving communities, helping customers and delivering low-carbon nuclear power responsibly. Six of the sustainability commitments were due to be delivered in 2012. Two of them have been achieved in 2011. As previously reported, two of the commitments were achieved ahead of target in 2011, namely commitment that 2.5 million young people in the UK will have participated in the EDF

Energy Sustainable Schools initiatives and commitment to cut CO<sub>2</sub> emissions from its transport by 20%. Two further commitments had target to reduce CO<sub>2</sub> from EDF Energy's commercial buildings by 30% and involvement of EDF Energy's employees in sustainable development. Steady progress was made throughout 2012 towards meeting these commitments. From the investments made in 2012 we expect that the target to reduce CO<sub>2</sub> from commercial buildings will be met in 2013. In 2012, employee involvement was high and should increase further as new sustainability commitments will be rolled out in 2013.



### 6.3.1.5 EDF Energy's People

EDF Energy is a responsible employer of over 15,000 people. The annual employee engagement survey, once again in 2012, shows that employee engagement levels are higher than those of other UK and global energy sector benchmarks. Some 87% of our employees completed the survey.

EDF Energy's focus on Health, Safety and Wellbeing, Diversity & Inclusion and the investment we continue to make in the training and development of its people are all considered to be important drivers of business performance and are a key feature of the EDF Energy culture. Health & Safety is seen by 93% of employees as a priority for the company. EDF Energy has been recognised externally by the award of the prestigious Diversity Works for London Gold Standard<sup>1</sup> in November 2012 and Campus, our world class training facility in Somerset, will open in 2013.

When business needs require change to be implemented, it is done so in an open and transparent way, partnering with employee representatives and Trade Union colleagues, widely communicated and consulted upon and with support offered to those affected.

### 6.3.1.6 London 2012 Olympic and Paralympic Games

EDF was an official partner and the official electricity supplier to the London 2012 Olympic and Paralympic Games. EDF Energy supplied electricity to the Olympic Park which was backed by low carbon sources 80% from nuclear and 20% from renewables.

EDF Energy was the highest profile domestic sponsor for four months in a row<sup>1</sup>. The "Energy of the Nation" campaign conducted at the EDF Energy London Eye during Games time was the first ever social media driven light show and helped drive awareness of EDF Energy's sponsorship of the landmark to an all time high.

### 6.3.1.7 Structure of the EDF Energy group

The Group is organised into three main business units: Energy Sourcing and Customer Supply; Nuclear Generation; and Nuclear New Build.

Since 2009, Centrica plc ("Centrica") has held a 20% shareholding in Lake Acquisitions Limited, the company within which the Nuclear Generation business unit sits. Centrica also held a 20% stake in NNB Holding Company Limited, the company which has been created to undertake the pre-development activities for a nuclear new build programme in the UK. On 4 February 2013 Centrica announced its decision not to participate in the UK nuclear new build. This decision does not affect the continuing partnership between the two companies in the Nuclear Generation business.

#### 6.3.1.7.1 Energy Sourcing and Customer Supply business unit ("ESCS")

ESCS has the responsibility for maximising the long term value of EDF Energy's residential and business customers' portfolios, gas storage assets, fossil fuel fired and renewable generation assets, and optimisation of the company's exposure to energy markets within an agreed risk mandate. ESCS employs around 8,000 people.

ESCS optimises EDF Energy's wholesale market risks centrally and takes advantage of combining energy sourcing and customer supply activities from all EDF Energy business units.

### Energy sourcing

#### Nuclear generation

The power generated by the Nuclear Generation fleet is sold through intra-group transactions between Nuclear Generation and ESCS in order to allow a single point of optimisation of the company's wholesale market exposures. Since April 2010, 20% of the generation output from Nuclear Generation is separately sold to Centrica at a price based on Heren's prices under the agreements made at the time of the Centrica transactions.

#### Thermal energy generation and gas storage

The part of EDF Energy's generation business that is held within ESCS (which excludes Nuclear Generation and Sutton Bridge) comprise two fossil fuel generation power plants in the UK with a total generation capacity of 4.1GW, namely:

- Cottam: located in Nottinghamshire, Cottam is a coal-fired power plant with a capacity of 2,008MW generated by four units. The final unit was commissioned in 1970; and
- West Burton: located in Nottinghamshire, West Burton is a coal-fired power plant consisting of four coal-fired units and two 20MW Open-Cycle Gas Turbines ("OCGT"), with a total capacity of 2,052MW. The final unit was commissioned in 1970.

In the year ended 31 December 2012, Cottam and West Burton power plants generated 22.8TWh of electricity, one of the strongest outputs ever achieved on the back of a very high availability factor and high dark spread.

EDF Energy also owns a 1.4MW Combined Heat and Power ("CHP") Scheme, it has an operation and maintenance agreement for a 9.0MW CHP site and it also has an 18.6% shareholding in Barking power station, located in the London area.

EDF Energy is constructing a new Combined Cycle Gas Turbine ("CCGT") plant at West Burton (over 1,300MW), consisting of three 435MW units, which is expected to start commercial operations gradually across 2013 and will then be managed by ESCS. Unit 2 has started reliability runs on 4 February 2013.

On 29 June 2012, EDF Energy completed the sale of District Energy ("DE"), a portfolio of four gas-fired, network connected, electricity generation sites based in Kent, Somerset and South Wales, to UK Power Reserve Limited ("UKPR").

EDF Energy has developed and is in the process of delivering a fast cycle gas storage facility alongside EDF Trading's existing Hole House gas storage facility in Cheshire. Two cavities with a total capacity of 9.6 million therms have been commissioned with commercial operation commencing in 2013. Up to eight additional cavities could be commissioned between now and 2017.

#### Renewables

Through EDF Energy Renewables ("EDF ER"), a joint venture between EDF Energy and EDF Énergies Nouvelles. EDF Energy is developing its own onshore and offshore assets, signing power purchase agreements with renewable generators and supporting independent developers to ensure a balanced approach for compliance with its Renewables Obligations ("RO") and the provision of renewable electricity to its customer base. The RO has been subject to various reforms and in 2010 the end date was extended from the current end date of 2027 to 2037 for new projects.

1. Source: Ipsos September 2012, Olympic Sponsorship Tracker Report.

During 2012, the renewables operational portfolio increased by 36MW, with Green Rigg wind farm commencing operations in the last quarter of 2012. At the end of 2012, EDF Energy Renewables operated 21 wind farms with a total capacity of 304MW. These are primarily located in the north of England and in Scotland.

In addition, EDF Energy Renewables has 225MW of capacity under construction. This includes three onshore wind farms: Fallago Rig, Boundary Lane and Glassmoor and EDF Energy Renewables' first offshore wind farm, Teesside. The Teesside wind farm will have an installed capacity of 62MW and is scheduled to enter commercial operation in first half 2013.

EDF Energy also has joint ventures with:

- Eneco, a Dutch energy utility, to develop an offshore wind project to the west of the Isle of Wight, Navitus Bay. This is part of The Crown Estate Round 3 offshore wind programme and the proposed development could deliver between 900MW and more than 1,100MW of capacity;
- AMEC, a construction group, to develop a wind farm at Stornoway on the Isle of Lewis. This project to construct a more than 130MW wind farm received approval from the Scottish Government in September 2012.

## Optimising and managing risks

### General principles

The policies surrounding EDF Energy's energy purchasing and risk management are compliant with EDF Group's policies and ensure that EDF Energy's activities are optimised and its services delivered at a competitive price while limiting its gross margin volatility. EDF Energy buys and sells power, gas, coal, carbon and other commodities on the wholesale markets to fulfil the needs of its generating plants and customers.

### Electricity sourcing

Over and above its own generation, EDF Energy also sources electricity through export power supplied from power purchase agreements which are mainly renewable and CHP generators. In 2012 EDF Energy acquired approximately 2.8TWh through this channel.

For delivery in 2012 EDF Energy's net position on the wholesale market was a sale of approximately 18TWh (including structured trades).

### Gas, coal and carbon rights procurement

Coal and gas contracts (physical and financial) are entered into by EDF Energy, as well as contracts to procure financial carbon rights, to hedge the fuel requirements of its power plants and gas consumers.

Purchases are based on coal and gas asset generation forecasts and target minimum gas and coal stock levels. In 2012, EDF Energy sourced coal equally from domestic UK suppliers and international suppliers through EDF Trading.

ESCS Business units has a need for gas to supply its residential gas and dual fuel customer portfolio, its OCGT units and its new West Burton B CCGT power station. The current approach followed by ESCS is to source all the required gas from the wholesale gas market through purchases mainly on the forward market executed by EDF Trading.

### Customer Supply

EDF Energy sells energy to two major customer segments: residential customers, described as the Business to Customers segment ("B2C"); and business customers, described as the Business to Business segment ("B2B") with the size of business customers ranging from large industrial

businesses to small privately owned businesses. EDF Energy adopts different risk management strategies for B2C and B2B.

At the end of December 2012, EDF Energy had 3.9 million customers and 5.8 million customer accounts across those two segments. During the year it supplied 17TWh of electricity to 3.5 million B2C accounts, 203,195 B2B Small and Medium Enterprise ("SME") accounts and 35.0TWh<sup>1</sup> of electricity to 108,300 B2B Major Business accounts. It also had 2.0 million B2C gas customer accounts and supplied 30.9TWh of gas to these customers in 2012.

### B2C

B2C tariffs tend to follow the overall trend of commodity prices over the long term, but do not reflect their short term volatility. This is the result of a hedging strategy that efficiently smoothes market volatility and is regarded as a key competitive factor for all electricity and gas suppliers in the UK market.

On 26 October 2012 Ofgem published its detailed Retail Market Review ("RMR") Updated Domestic Proposals. The aim of the RMR is to enable consumers to get the best deal in the energy market and to rebuild trust and confidence in the market. The proposals will require suppliers to provide consumers with simpler choices, clearer information about prices, products and available savings and fairer treatment of customers through the introduction of Standards of Conduct backed by licence conditions. These are all in line with EDF Energy's own ambitions synthesised in our Customer Commitments to Simplicity, Fair Value and Better Service. The aim of which is to earn the trust of our customers. Subject to the outcome of the statutory consultation Ofgem aims for these proposals to come into legal effect through supply licence conditions by summer 2013. EDF Energy has anticipated most of the proposed changes and will be at the forefront of UK energy companies in implementing these licence requirements.

EDF Energy was the first of the major suppliers to announce a price cut in January 2012, reducing gas by 5% in February. A second round of price changes began in the UK market in August 2012, as a result of significant increases in electricity network, social and environmental costs, coupled with movements in wholesale energy prices. On 26 October 2012 EDF Energy became the fifth of the six major suppliers to announce a price increase of (on average) 10.8% for both electricity and gas customers. During 2012, EDF Energy introduced a new fixed price product with Blue+ Price Promise. This product was unique to the industry with electricity backed by low carbon nuclear generation, an innovative price promise, no termination fees, a Thank You reward every month and a promise to notify the customer if a competitor launches a product that's cheaper by more than £52 per year, i.e. £1 per week. Since EDF Energy launched its first Blue+ Price Promise product in April 2012, over 1 million customer accounts have switched to this innovative product.

EDF Energy continued to lead the market in helping vulnerable customers. It was the only supplier to introduce a new rebate scheme for our most vulnerable elderly customers who are identified by the Department of Work and Pensions as most in need. This will ensure they automatically benefit from our cheapest tariff. This strategy of trust, transparency and fairness allowed EDF Energy to successfully grow its residential portfolio across 2012, with B2C customer accounts now totalling 5.5 million, the highest ever year-end level.

Across 2012 EDF Energy has successfully transferred the whole of its customer portfolio onto a new Customer Relationship Management platform which will allow the company going forward to significantly enhance customer experience while reducing management cost per product.

Churn rates in the United Kingdom B2C market (the net result of customer losses and acquisitions) remained relatively high compared to other countries,

1. Power supplied to final customer including previous year metering cut-offs.

even though there has been a downward trend from the high of 2008. At the end of September 2012, 16.2 million (62%) of UK B2C electricity customers and 12.7 million (58%) of UK B2C gas customers were no longer with their original supplier at the time of market liberalisation<sup>1</sup>.

## Smart Metering

UK energy suppliers are mandated to deliver the Government's Smart Metering Programme which requires all reasonable steps to be taken to deploy smart electricity and gas meters to 97% of residential and small business customers by 2019. This will require EDF Energy's supply business to install meters, including communications hubs and in-home displays, to its 3.9 million domestic and small business customers. The purpose of the deployment is to enable customers to reduce their usage, cut end-use carbon emissions and unlock supplier savings through more efficient billing and meter reading.

EDF Energy has already commenced smart meter installations through a series of trials and pilots to test smart grid technology with UK Power Networks, through the Low Carbon London trial.

## Carbon Emissions Reduction Targets ("CERT") and Community Energy Saving Programme ("CESP")

EDF Energy was required to participate in the Government's CERT programme which aimed to reduce the carbon footprint of energy consumers' homes by promoting low carbon energy solutions. CERT was extended to December 2012, setting an increased lifetime carbon dioxide ("CO<sub>2</sub>") savings target of 293 million tonnes of CO<sub>2</sub> across all suppliers. EDF Energy's share of the CERT obligation was 31MtCO<sub>2</sub> which was delivered in full within the required timeframe. We have installed a total of 900,000 insulation measures all over the country, helping to keep homes warmer and fuel bills lower across the UK. Within the total number of insulation measures installed 430,000 and 80,000 were delivered against the sub-targets of both the Priority Group, those aged 70 and over and receiving state benefits because they are on a low income and the Super Priority Group, which is a sub-set of the Priority Group and includes those who have children under five or a person who is disabled in the household. EDF Energy was also required to participate in the Government's CESP programme which required gas and electricity suppliers and electricity generators to deliver energy saving measures to domestic consumers in specific low income areas. EDF Energy also complied in full and within the timeline for this obligation and has installed over 24,000 insulation measures.

CERT and CESP both expired in 2012 and were replaced by the Energy Company Obligation ("ECO").

## B2B

The B2B division is the largest supplier of electricity to the non-domestic market (SME and major business) in the UK, supplying 36.8TWh and holding a 20% share of the market<sup>2</sup>. B2B supplies businesses across all Industrial and Commercial ("I&C") sectors including public sector buying groups, large multi site customers, manufacturing businesses and SME.

There have been some significant contracts won over the year, with EDF Energy being selected as the sole supplier of electricity to the Scottish Procurement Services. This follows the successful conclusion of the English Government Procurement Service contract in 2011. B2B also established contracts to power several iconic buildings in support of the 2012 Olympic Games: Tower Bridge; The London Eye; and the Olympic stadium itself, which were all powered with Blue low carbon power sourced from our nuclear generation. More recently EDF Energy announced a ten-year deal to supply Network Rail with 3.2TWh of low carbon electricity a year. We will power a rail network which carries three million passengers and tens

of thousands of tons of freight a day. As a result, the business continues to be well established in the large, national and multi-site customer segment.

However competition across I&C sectors remains fierce. This is demonstrated by the continued erosion of the combined market shares of large suppliers by smaller entrants and the increasing influence of Third Party Intermediaries. This resulted in putting supply margins for business contracts under pressure. B2B is responding to this with significant emphasis on creating additional value from customer relationships through low carbon energy purchasing agreements and energy services products.

B2B continues to focus on improving products, processes and systems designed to enhance the customer experience. In particular, B2B invested a significant amount of resources to implement a new integrated pricing, billing and metering platform. Full migration of customers and prospect data will be phased over several stages across 2013.

### 6.3.1.7.2 Nuclear Generation business unit

EDF Energy owns and operates eight nuclear power stations (Nuclear Generation Fleet) in the UK with a total capacity of 8,741MW. The Nuclear Generation business unit employs over 5,500 people.

## Nuclear Generation fleet technology

Seven of the eight nuclear power stations are Advanced Gas-Cooled Reactor ("AGR") power stations (Dungeness B, Hartlepool, Heysham 1, Heysham 2, Hinkley Point B, Hunterston B and Torness) and the eighth is a Pressurised Water Reactor ("PWR") power station (Sizewell B). Each of the AGR power stations has two reactors and two turbines; the PWR has one reactor and two turbines.

An AGR differs in many respects from a PWR. Whereas the AGR design is unique to the UK, the PWR design is the most common reactor type in the world:

- an AGR has a graphite moderator which helps to control the reaction. The reactor is encased in a steel-lined pre-stressed concrete pressure vessel several metres thick which also acts as a biological shield. The steam generator in which water is heated is situated inside the pressure vessel. An AGR uses enriched uranium dioxide encased in a stainless steel pin for its fuel and CO<sub>2</sub> as its coolant;
- a PWR is contained inside a steel pressure vessel filled with pressurized water which acts as the moderator and coolant. The pressure vessel is located behind concrete biological shield walls within a steel-lined, reinforced concrete containment building. The fuel used is enriched uranium dioxide and is contained in zirconium alloy tubes.

## Regulation

The operation of nuclear power stations is subject to extensive regulation in a number of areas, including nuclear safety and security (in particular, in relation to the construction, operation and decommissioning of nuclear installations and the protection of workers and the public against ionising radiations), electricity market and environmental regulation.

## Safety

Nuclear safety is our overriding priority and EDF Energy has no greater responsibility than to protect the public, the environment and its employees from the potential adverse effects of our stations. Having a strong safety culture embedded in the organisation is crucial to achieving these goals and we continue to invest in the training and development of our staff.

The actual and potential significance of individual nuclear events is measured against the International Nuclear Event Scale ("INES"). These are categorised

1. Source: Department of Energy and Climate Change, quarterly energy prices, December 2012.

2. Cornwall Energy Associates, 31 October 2012.

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between Level 0, which has no safety significance and Level 7 which represents a major accident. During the year ended 31 December 2012, EDF Energy had no nuclear event rated higher than INES 1 and 12 INES Level 1 events.

EDF Energy operates to strict procedures to minimise and control the radiation doses received by employees and contractors at all of EDF Energy's existing nuclear power stations. Any worker required to enter a radiological controlled area is issued with an electronic personal dosimeter, which measures radiation dose and warns the wearer if pre-determined dose levels are exceeded.

Radiation doses are measured in millisieverts (mSv), and the legal dose limit is 20mSv per year. In calendar year 2012, the average individual dose received by all workers on EDF Energy's existing nuclear sites was 0.061mSv. The highest individual dose received in 2012 was 8.2mSv.

### Impact of the Fukushima accident on Nuclear Generation

After the events at Fukushima, the Office for Nuclear Regulation ("ONR") carried out an independent review of UK nuclear power plants. This concluded that the "UK nuclear facilities have no fundamental weaknesses". These findings were supported by EDF Energy's Japanese Earthquake Response ("JER") Programme on completing an internal review and challenge across the entire fleet of nuclear power plants which showed "there is no challenge to nuclear safety for within design basis events". Over 18 months after the events in Japan, EDF Energy is still committed to enhancing the capability of their fleet of eight nuclear power plants to withstand and recover from an extreme natural event. The process of reviewing the fleet over this period has fed into both the ONR and European Nuclear Safety Regulators Group ("ENSREG") with Nuclear Generation focusing on analysing current safety margins and exploring the vast variety of options of how safety could be further enhanced. It has been widely and positively noted that EDF Energy is committed to continuing to learn from Fukushima by reviewing operating experience and responding to the ONR and ENSREG whilst also supporting

the WANO Corporate & Station review. EDF Energy is now in the delivery phase where enhancements have been agreed and are being made across the entire fleet. The JER Programme has developed a fully integrated solution that enhances the capability of the fleet by incorporating improvements to on-site resilience, the purchase of back-up equipment and enhancements to emergency arrangements to support current procedures.

### The operating lifetime of power plants

The potential lifetime of each of the power stations is determined primarily by the technical and economic practicability of supporting an agreed safety case for that power station in accordance with its nuclear site licence. Any decision by EDF Energy to extend the operating life of a power station beyond its current scheduled closure date would be based, in large part, on a combination of economic factors and the engineering judgments reached in respect of technical and safety issues. Lifetime extensions will require the consent of the Nuclear Decommissioning Authority ("NDA") if the extension will result in an increase in the Costs of Discharging Liabilities (as defined in the Nuclear Liabilities Funding Agreement).

The adequacy of the safety case for each power station is confirmed at each statutory outage for the following period by undertaking appropriate inspection, maintenance and testing of the plant and reviews of its operating performance. The results are reported to the ONR, which must give its formal consent under the nuclear site licence before the reactor concerned may be restarted. A reactor may only be operated following restart for the period determined by the safety case. This period is normally three years for AGR power stations and eighteen months for the PWR power station.

In addition, every ten years EDF Energy is required to undertake a Periodic Safety Review ("PSR") for each power station. PSRs also require ONR acceptance in order to secure continued operation of a power station.

The current station lives (as formally declared by the company and approved by the NDA) and corresponding current scheduled closure dates of the power stations in the Nuclear Generation Fleet are set out in the following table:

Power Plant	Type of reactor	Start of Generation	Power Station Lifetime (Formally Declared)	Life Extensions (Already Formally Declared)	Associated Scheduled Closure Date	Scheduled Periodic Safety Reviews <sup>(1)</sup>
Hinkley Point B	AGR	Feb. 1976	47 years	22 years	2023	2017
Hunterston B	AGR	Feb. 1976	47 years	22 years	2023	2017
Dungeness B	AGR	Apr. 1983	35 years	10 years	2018	2018
Heysham 1	AGR	Jul. 1983	35 years	10 years	2019	2019
Hartlepool	AGR	Aug. 1983	35 years	10 years	2019	2019
Torness	AGR	May 1988	35 years	10 years	2023	2020
Heysham 2	AGR	Jul. 1988	35 years	10 years	2023	2020
Sizewell B	PWR	Feb. 1995	40 years	–	2035	2015

(1) ONR's response expected.

The table shows that the lives of the AGR stations have already been extended by between 10 to 22 years compared to their original lives. These formal extensions were declared following completion of the necessary technical and economic evaluations and receipt of the relevant external consents.

In February 2012, EDF Energy announced that it will continue to seek life extensions for all its nuclear power stations where it is safe and commercially viable to do so. Based on a technical review of the potential life limiting plant areas, which was completed in 2011, and subject to the necessary formal reviews and approvals, EDF Energy expects in due course to achieve

further life extensions of an average of seven years across the AGR fleet relative to the scheduled closure dates assumed in January 2009 (including the extension of Hartlepool and Heysham 1 by 5 years to 2019 declared in December 2010 and 20 years for Sizewell B).

In December 2012, EDF Energy announced that having completed the necessary technical, safety and economic evaluation and receiving the relevant external consents, the decision has been made to extend the lives of Hinkley Point B and Hunterston B power stations by seven years. This decision moves the formal scheduled closure date to 2023 and meets the



company's Lifetime Programme expectations. Consideration of the formal lifetime extensions for other stations will be completed around three years before the scheduled closure date of each station. The next station to be considered is Dungeness B.

## Capacity and output

The table below shows the last two years' actual capacity and output of each of the nuclear power stations.

Power Plant	Capacity (MW) <sup>(1)</sup>	Output <sup>(2)</sup> (TWh) Year ended 31 December	
		2012	2011
AGR Power Plants			
Dungeness B	1,040	4.1	1.3
Hartlepool	1,180	8.8	7.4
Heysham 1	1,160	6.6	8.6
Heysham 2	1,220	9.4	8.5
Hinkley Point B	870	6.3	6.1
Hunterston B	890	6.9	6.3
Torness	1,190	8.6	9.0
PWR power plant			
Sizewell B	1,191	9.3	8.6
TOTAL	8,741	60.0	55.8
LOAD FACTOR <sup>(3)</sup>		78%	73%

(1) Capacities are stated net of all power consumed for the power stations' own use, including power imported from the Grid. Capacities are subject to review each year end. The capacities shown reflect the benchmark generation of units from 1 January 2012. In particular, Hinkley Point B and Hunterston B power stations have been adjusted to reflect planned operation at approximately 70% load, due to boiler temperature restrictions.

(2) Output in each year reflects any re-fuelling, planned and unplanned outages.

(3) Load factors are obtained by dividing the actual output by the output that would have been achieved had each power plant operated at its stated capacity appropriate for the period.

## Operational review of the existing Nuclear Generation fleet

Output from the Nuclear Generation fleet for the year ended 31 December 2012, was 60.0TWh, which meets the performance objective of consistently achieving nuclear output above 55TWh and which was 4.2TWh higher than nuclear output of 55.8TWh for the year ended 31 December 2011. The increase principally reflects Dungeness B fuel route improvements, resolution of the Heysham 1 Reactor 2 hot box dome temperature restriction and a shorter statutory outage programme.

During the year ended 31 December 2012, a programme of planned outages was carried out on the Nuclear Generation fleet. Statutory outages were completed on Dungeness B Reactor 22, Heysham 1 Reactor 2, Hinkley Point B Reactor 3, Hunterston B Reactor 3 and Torness Reactor 2. This programme of outages reflects the continued focus on investment to improve the long-term reliability and safe operation of the Nuclear Generation Fleet by proactively targeting investment designed to deliver equipment reliability and to reduce the risks of future losses.

### Plant status

#### Dungeness B

Following work during 2011 on the fuel route plant, which provides a means of removing spent fuel from the reactors and inserting new fuel, both units at Dungeness B were able to return to full power operation during 2012.

#### Heysham 1 Reactor 2

Load was reduced on Heysham 1 Reactor 2 to approximately 80% of its full load in October 2006 to reduce the surface temperature on an area within the reactor, known as the Hot Box Dome. Following a modification to create additional cooling paths and further analysis to enable improvements

to be made in the accuracy of the calculation of the Hot Box Dome upper surface temperature, Heysham 1 Reactor 2 was able to return to full power operation during 2012.

## Costs relating to radioactive waste management and decommissioning – Restructuring agreements of British Energy Group

Restructuring Agreements were originally entered into on 14 January 2005 as part of the restructuring of the former British Energy Group of companies (hereafter referred to as "the EDF Energy Nuclear Generation Group") carried out from 2002 under the aegis of the UK Government in order to stabilise the financial situation of the EDF Energy Nuclear Generation Group.

By virtue of these restructuring agreement:

- the Nuclear Liabilities Fund ("NLF"), an independent trust set up by the UK Government as part of the restructuring exercise, agreed (at the direction of the Secretary of State) to fund, to the extent of its assets: (i) qualifying uncontracted nuclear liabilities (including liabilities in connection with the management of spent fuel at the Sizewell B power station); and (ii) qualifying costs of decommissioning in relation to the existing nuclear power stations owned and operated by EDF Energy Nuclear Generation Limited;
- the Secretary of State agreed to fund: (i) qualifying uncontracted nuclear liabilities (including liabilities in connection with the management of spent fuel at the Sizewell B power station) and qualifying costs of decommissioning, in each case in relation to the existing nuclear power stations owned and operated by EDF Energy Nuclear Generation Limited, to the extent that they exceed the assets of NLF; and (ii) subject to a cap of £2,185 million (in December 2002 monetary values, adjusted accordingly), qualifying contracted liabilities for the EDF Energy Nuclear Generation Group's spent fuel (including in particular liabilities for management of AGR waste from spent fuel loaded prior to 15 January 2005); and



- EDF Group is responsible for funding certain excluded or disqualified liabilities (mainly liabilities incurred in connection with an unsafe or careless operation of the power stations) and the potential associated obligations of its subsidiaries to the NLF and the Secretary of State are guaranteed by the principal members of the EDF Energy Nuclear Generation Group.

Certain companies in the EDF Energy Generation Group including EDF Energy Nuclear Generation Limited entered into a separate contract, now with the NDA for management of AGR spent fuel loaded from 15 January 2005 and have no responsibility for this fuel after it is received at Sellafield.

The Secretary of State and EDF S.A. agreed to limited amendments to the Restructuring Agreements in connection with the acquisition of the EDF Energy Generation Group by Lake Acquisitions. The amendments, among other things and subject to limited exceptions, restrict the majority of rights and obligations imposed by the Restructuring Agreements only to EDF Energy Nuclear Generation Group Limited and its subsidiaries and subsidiary undertakings and accordingly, do not extend similar rights and obligations to EDF, or its other subsidiaries and subsidiary undertakings. The amendments do not impact on the contractual funding commitments of the Secretary of State or NLF to the EDF Energy Nuclear Generation Group.

Certain amendments have been made to the Restructuring Agreements, reflecting the EDF Energy Nuclear Generation Group access to an improved credit rating following the acquisition. In particular, EDF Energy Nuclear Generation Group Limited is required to maintain a minimum cash reserve. The amendments reduced the minimum level to £290 million. The cash reserve may be further reduced to nil provided the EDF Energy Nuclear Generation Group achieves and maintains an investment grade rating or irrevocable Committed Facilities of the same amount are put in place between third party financial institutions or a member of the wider EDF group with an investment grade rating and a member of the EDF Energy Nuclear Generation Group.

### 6.3.1.7.3 Nuclear New Build business unit ("NNB")

#### Nuclear New Build business unit activity

##### Introduction

EDF Energy aims to build up to four new EPR nuclear reactors in the UK: twin reactors at Hinkley Point and possibly a further twin at Sizewell. The plans are conditional on the necessary consents being received and a robust investment framework being in place.

Safety is a key focus of the EPR design and for the NNB business unit. The same EPR technology is already being deployed at the new nuclear power station being constructed by EDF at Flamanville in France and at Taishan in China (as part of a joint venture) (see 6.2.1.1.3.5 ("Preparing for the future of the nuclear fleet in France")). Using the same technology, adapted for UK requirements, will enable the efficiencies that come with standardisation of design in the construction and operation of a series of plants. In December 2012, NNB passed 2,900,000 hours without a Lost Time Incident ("LTI"), this achievement was especially significant as over 30% of man hours were worked on Hinkley Point C ("HPC") nuclear new build and Sizewell C ("SZC") nuclear new build sites.

##### Hinkley Point C

##### Planning and Consents Progress

Significant progress with environmental permits has been achieved through the year. Applications for the Construction Water Discharge Activity Permit ("CWDAP"), which is required to construct HPC, and for the three main environmental permits required to operate HPC were submitted in the

summer of 2011. On 29 February 2012 the CWDAP permit for the HPC project was granted with pre-operational conditions. In August 2012 the Environment Agency ("EA") issued draft decisions on the three operational permits. These are the Radioactive Substances Regulation ("RSR") Environmental Permit which sets limits on the safe and controlled discharge and disposal of small amounts of radioactive waste from the operation of the facility, the Combustion Activity Environmental Permit which regulates discharges from backup diesel generators and the Construction Water Discharge Activity Permit which regulates the discharge of cooling water and associated trade effluents from the operation of the power station.

Before an RSR permit is granted for any planned new nuclear power station, Article 37 of the Euratom Treaty requires the UK Government to make a submission to the European Commission enabling it to determine whether the plan is liable to result in radioactive contamination of another member state. The EA cannot grant an RSR permit until the Commission has given its opinion. In the case of HPC, following Article 37 submissions by the UK Government, the Commission provided its opinions in February and May 2012 that the plans for HPC are not liable to result in such radioactive contamination. In its draft decision, the EA noted "our overall conclusion at this stage is that there are no reasons why we should not issue all three permits. We consider that the limits and conditions in the draft permits are suitable to protect people and the environment". Public consultation on the draft decisions ended on 9 November 2012 and following the results of the consultation, the three operational permits were formally issued on 13 March 2013.

The Planning Inspectorate ("PINS"), is an executive agency of the Department for Communities and Local Government. It deals with planning appeals, national infrastructure planning applications, public examinations of local development plans and other planning-related and specialist casework in England and Wales. PINS appointed five inspectors (the "Examining Authority") to assess the HPC application during the six-month examination phase, which ended on 21 September 2012. The Examining Authority then had three months within which to make its recommendation to the Secretary of State for Energy and Climate Change ("SoS"), which it did on 19 December 2012.

On 19 March 2013, the Secretary of State ("SoS") for energy and climate change has approved the Development Consent Order giving EDF Energy the planning permission to build a new nuclear power station at Hinkley Point C.

In August, the European Commission approved EDF's investment plans for HPC under Article 41 of the Euratom Treaty concluding that it "fulfils the objectives of the Euratom Treaty and contributes to develop a sustainable national energy mix". Under the treaty developers of new nuclear power stations are required to notify the Commission of any investment projects. EDF Energy submitted its documentation in January 2010.

In summer 2012, the temporary jetty applications were granted and the relevant Orders authorising construction and operation of the jetty came into force. The jetty will play a major role in bringing construction material to the HPC site by sea and in doing so reduce the impacts of the construction period on the local road network and the associated environmental effects. Dean & Dyball Civil Engineering was appointed at the end of the year to construct the jetty.

EDF Energy and Somerset councils signed a landmark agreement in August 2012 which resolves all the Councils principal issues relating to the planning application for HPC and which will deliver nearly £100 million for local communities to mitigate the impact of the proposed HPC power station. Under the arrangement, known in planning terms as a section 106 agreement, more than £64 million will be spent on supporting local communities and services such as education, training, transport and housing. This is addition to about £30 million committed by EDF Energy in January 2012 in relation to site preparation works.

## **Revenue Arrangements**

The Energy Bill including the Contract for Difference ("CfD"), is a key milestone for the project and the implementation of the reforms it introduces is expected in 2013-2014. As such an Investment Contract (an early form of CfD) is being negotiated with the Department of Energy and Climate Change ("DECC") for HPC. The conclusion of these discussions remains a key step for the HPC Final Investment Decision ("FID").

## **Funded Decommissioning Programme ("FDP")**

Operators of new nuclear power stations are required under the Energy Act 2008 to have a FDP in place and approved by the SoS before nuclear safety related construction begins. The overall objective of the FDP is to ensure that operators make prudent provision for:

- the full costs of decommissioning their installations; and
- their full share of the costs of safely and securely managing and disposing of their waste; and that in doing so the risk of recourse to public funds is remote.

A preliminary version of FDP was formally submitted in draft form to DECC in March 2012. There have been a series of subsequent discussions with DECC and their advisers, including the independent Nuclear Liabilities Financing Assurance Board. EDF Energy and DECC are working to an overall review and discussion programme to achieve an approvable FDP in time for FID and on 17 December 2012, EDF Energy received a letter from the Managing Director of the Office for Nuclear Development in DECC confirming that DECC and NNB had reached agreement in principle on the FDP.

## **UK EPR Generic Design Assessment ("GDA")**

On 13 December 2012, the Health & Safety Executive ("HSE") issued a "Design Acceptance Confirmation" ("DAC") and the EA issued a "Statement of Design Acceptability" ("SODA") thereby signifying their acceptance that the UK EPR design is capable of meeting the licensing requirements for design, construction, operation and decommissioning of a nuclear power station in the UK. This marked the end of the GDA process that commenced in 2007.

The granting of the DAC and SODA resulted from Office for Nuclear Regulation ("ONR") and EA being satisfied that the requesting parties (EDF and AREVA) had satisfactorily resolved the outstanding "GDA Issues" that remained after ONR and EA had issued an interim DAC and an interim SODA in July 2011. The work to achieve these resolutions was progressed in accordance with the published "Resolution Plans". This has involved a huge effort both from the requesting parties and from the regulators (ONR and EA). Granting of the DAC and SODA are important milestones that form part of the process for allowing the start of Nuclear Island construction at HPC.

## **Nuclear Site Licence ("NSL")**

Since the 2011 HPC NSL Application and throughout 2012 NNB has continued to develop its Licence Condition compliance and organisational arrangements to meet NSL requirements. During this time EDF Energy has also assisted the ONR in its intervention activities and assessment of site specific technical justifications, NNB arrangements and overall organisational capability to be a nuclear site licensee.

EDF Energy undertook its own readiness review to become a nuclear site licensee and reported the findings to the ONR. ONR concluded its overall assessment of NNB capability and a positive outcome to the assessment resulted in the HPC NSL being granted on 26 November 2012.

Moving forward further development of arrangements is needed to maintain the NSL. This will include arrangements for commissioning and operation.

## **Main Construction Contracts**

The contractor for the early enabling Earthworks contract was appointed earlier in 2012 and is currently completing the contractor design phase, ready for mobilisation of construction activities

The preferred bidders have also been selected for the four major construction contracts – Main Civil Works, Conventional Island, Marine Works and combined Nuclear Steam Supply System and Instrumentation & Controls. Contract documents are currently being finalised ready for signature in case of a positive final investment decision. A number of these selected contractors are being engaged on Early Contractor Involvement activities, including inputting into the HPC Engineering and Pre-Construction Planning teams to help de-risk the project and better secure the construction schedule. Procurement also continues on other critical path contracts including the early Associated Development enabling works (Road Improvements, Bypass, Logistic Facilities & Worker Accommodation) and also with the key Electrical & Mechanical Equipment supply contracts for the main site.

## **Land Deals**

Land acquisition has mirrored the planning progress and reflects those sites applied for in the PINS process.

In 2012 the land required at the main site for the construction of HPC has been secured with negotiations concluded with relevant parties to allow the putting in place of three 999 year leases of the HPC main site. This supports the security of tenure requirements for a NSL.

## **IT implementation**

Work to prepare the technical infrastructure required to support the project has continued with the implementation of a secure, flexible IT network dedicated to New Nuclear Built which received ONR (Civil Nuclear Security) accreditation in June 2012.

## **HPC Site Activities**

In the first quarter of 2012, New Nuclear Built Division ("NNB") became the tenant of the full HPC site. EDF Energy also took over as principal contractor under the HSE's Construction Design Management regulations 2007. This allowed HPC to wholly align with NNB working procedures.

A contract was signed at the start of the year with Kier Bam to undertake preparatory works. Phase 1 of the Site Preparation Works commenced in March 2012, EDF Energy having discharged all the related conditions and undertaken preparation of documentation and working arrangements for the work. Phase 1 activities included the completion of construction of site fencing and perimeter access road, establishment of diversions of public rights of way, archaeological works and the removal of specific trees and hedgerows. Remediation works at HPC found significantly more asbestos materials than initially expected. The asbestos was left over from the construction of the A and B stations in the 1960s and 1970s. Information was submitted to West Somerset Council to keep them informed of the situation, however remediation of the majority of the site has been achieved with the completion of the first two of four remediation work phases. The completion of the remediation works is now subject to the granting of planning permissions and final construction sequencing approval.

## **Sizewell C**

On 21 November 2012 EDF Energy started its formal public consultation for a new proposed nuclear power station at Sizewell.

## 6.3.1.7.4 Commitments under European Commission Merger Regulation ("ECMR")

The British Energy Acquisition was subject to certain conditions, including Approval from the European Commission under the ECMR. On 22 December 2008, the European Commission announced its decision to approve the acquisition, subject to certain commitments by EDF. Specifically, EDF has committed to the following: (i) to divest EDF Energy's gas-fired power plant at Sutton Bridge; (ii) to divest British Energy's coal-fired power station at Eggborough; (iii) to sell minimum volumes of electricity on the UK wholesale market, ranging from 5 to 10TWh per year during the period from 2012 to 2015; (iv) to divest, without conditions, one site potentially suitable for the construction and operation of new nuclear generation facilities situated adjacent to existing British Energy stations at either Heysham or Dungeness, at the option of the potential purchaser; and (v) to give up one of the combined group's three grid connection agreements at Hinkley Point. Commitments (i), (ii), (iv) and (v) have been met. For item (iii) EDF energy has begun the sale of electricity on the wholesale market for the period 2012-2015. These sales are carefully monitored by the European Commission.

In accordance with these commitments undertaken with the European Commission, Sutton Bridge was operated under Hold Separate Arrangements under the management of a Hold Separate Manager during 2012. Moreover, EDF Energy put in place a Virtual Tolling, by which a third party toller receives the benefit of the plant's output and any associated benefits or liabilities.

On 12 December 2012 EDF Energy announced that it had reached agreement for the sale of Sutton Bridge power station to a Macquarie led consortium of investors. As part of the divestment of Sutton Bridge power station, EDF Energy also redeemed the Sutton Bridge Financing Limited bonds on 29 January 2013. Following the approval of the European Commission, the sale of Sutton Bridge power station was completed as of 27 March 2013, and the Virtual Tolling ended.

## 6.3.1.7.5 United Kingdom Legal Environment

### Electricity market reform and planning environment ("EMR")

Following the Government's consultation on EMR in March 2011, the UK Government published a White Paper on 12 July 2011 that set out its position on how it intended to move forward in reforming the UK's electricity market. As well as confirming the arrangements for the carbon price floor (announced at Budget 2011 and introduced as part of the Finance Act 2011), the White Paper focused on the three other policy elements of its EMR package: a feed-in tariff with Contracts for Difference ("CfD"); a capacity reserve mechanism; and an Emissions Performance Standard ("EPS").

The "carbon price support rate" that underpins the carbon price floor is set two years in advance, alongside indicative rates published for two further years. The carbon price support rate for 2014-2015 was therefore determined at Budget 2012 on 21 March 2012, together with indicative rates for 2015-2016 and 2016-2017.

On 22 May 2012 the Government published the draft Energy Bill comprising the legislation required to implement its EMR package. The draft Energy Bill was subject to pre-legislative scrutiny by the Energy and Climate Change Select Committee. After considering written evidence from stakeholders and conducting oral evidence sessions, the Committee published a report with its findings on 23 July 2012. This included a number of recommendations for the Government that the Committee believed would help develop a robust and effective bill.

The Government considered the Committee's report, and following continued active discussions with stakeholders, the Energy Bill was introduced to the House of Commons on 29 November 2012 by the Secretary of State

for Energy and Climate Change. The Energy Bill is intended to establish a legislative framework for delivering secure, affordable and low carbon energy. The EMR proposals dominate the Energy Bill and contain provisions for the Government's proposals from the White Paper, namely:

- Contracts for Difference – long-term contracts between a CfD counterparty and eligible generators, funded by contributions from licensed electricity suppliers to provide stable and predictable incentives for companies to invest in low-carbon electricity generation;
- Investment contracts – long-term contracts broadly similar to CfDs to enable early investment in advance of the CfD regime coming into force;
- Capacity Market – to ensure security of electricity supply;
- Emissions Performance Standard – to limit carbon dioxide emissions from new fossil fuel power stations.

The Government has also identified two areas where it believes action may become necessary and has proposed backstop powers in the Energy Bill:

- Firstly, while recognising the improvement in liquidity seen in the near term, it recognises that it may be necessary to introduce regulation to promote liquidity in general.
- Secondly, the Energy Bill provides powers for the Secretary of State to make changes to promote the availability of Power Purchase Agreements ("PPAs").

The Energy Bill will provide the legal certainty required for robust and durable CfDs, with a single Government-owned counterparty which will offer stability and value for customers, as well as long term assurance for investors. EDF Energy also welcomes confirmation that there will be a Capacity Mechanism with an intention to run the first auction in 2014, which will help maintain security of supply. EDF Energy is examining the detail of the Energy Bill and will continue to work with the Government and other stakeholders to deliver these reforms in a way that offers the best value for customers.

Following the normal Parliamentary scrutiny process, the Government's indicative EMR Roadmap expects Royal Assent of the Energy Bill towards the end of 2013.

## 6.3.2 Italy

### 6.3.2.1 EDF Group's strategy in Italy

The Italian energy markets have a strong strategic interest for EDF: the Italian gas market is the third largest in the European Union and the electricity market, the fourth largest European Union market, is connected to the French market and until now has benefited structurally from an average level of high prices.

Italy has long been a target market for EDF, as a source of long-term contracts with Enel, commercial development and energy services with the takeover of Fenice in 2001.

Also in 2001, EDF acquired an indirect stake in Edison. In 2005, EDF and Delmi, whose majority shareholder was AEM Milano Spa, the Milan regional electricity board, decided to take joint control.

On 24 May 2012, EDF took exclusive control of Edison Spa by purchasing Delmi's stake for €784 million in TdE (the holding company). EDF thus saw its shareholding in Edison increase from around 50% to 80.6%, obtaining exclusive control of Edison with the termination of the shareholders' agreement with Delmi. At the same time, Delmi acquired Edison's 50% stake in Edipower for €684 million.

EDF issued a mandatory tender offer on the remaining ordinary shares not owned by EDF, i.e. 19.36%, at the price of €0.89 per share: since

6 September 2012, following the mandatory tender offer, EDF has held 99.48% of Edison's ordinary shares.

As a result of the mandatory tender offer, the Italian stock exchange decided to delist Edison's ordinary shares with effect from 11 September 2012.

The current position and ambitions for growth of Edison allow the Group to implement a balanced strategy in Italy based on Edison's ambitions to manage its power generation fleet and develop its customer portfolio and its gas business.

The takeover of Edison provides EDF with a major player of the electricity market in Italy and a real International gas platform.

Following the takeover, EDF intends to give Edison a new outlook, with:

- development in Exploration and Generation (oil and gas), a sector in which the EDF Group can draw on Edison's substantial internal expertise;
- development of gas infrastructures: access to an LNG terminal (Rovigo) and import gas pipeline projects (ITGI/IGB, Galsi) additional to Group projects (South Stream, Dunkirk LNG terminal) with the objective to build from Italy a potential gas hub for Europe;
- international development in the Mediterranean basin (Balkans, Greece, Turkey, Egypt, etc.) and the Caspian Sea region, mainly through Edison's engineering skills in fossil-fuel fired and hydropower generation.

## 6.3.2.2 Presentation of the Group's business in Italy

The EDF Group operates in Italy mainly through its shareholding (97.405% at 31 December 2012) in Edison, which is a key operator on the Italian electricity and gas markets.

The remaining share capital, made up of savings shares, is still listed on the Italian stock exchange<sup>1</sup>.

Furthermore, the EDF Group operates in Italy through the following subsidiaries and shareholdings at 31 December 2012:

- EDF Fenice: the Group wholly owns EDF Fenice, a company specialised in energy and environmental services and efficiency. EDF Fenice, whose registered office is in Turin, has an international presence with subsidiaries in Spain, Poland and Russia. Its main activities are the generation of electricity and/or heat (from gas, coal, hydropower, biomass and waste), the operation and maintenance of energy assets, the treatment of solid and liquid industrial waste and environmental engineering (see section 6.3.2.6 ("Energy efficiency in Italy"));
- the Dalkia and EDF Énergies Nouvelles groups also own subsidiaries and holdings in Italy.

## 2012 Installed capacity and output of the EDF Group in Italy

### Electricity

2012 installed capacity (in MW)	Edison <sup>(1)</sup>	EDF Fenice	Total	%
Thermal	5,818	501	6,319	77
Hydropower	1,358	3	1,361	17
Other renewables <sup>(2)</sup>	490	-	490	6
<b>TOTAL</b>	<b>7,666</b>	<b>504</b>	<b>8,170</b>	<b>100</b>

2012 Output (in GWh)	Edison <sup>(1)</sup>	EDF Fenice	Total	%
Thermal	19,550	1,162	20,711	81
Hydropower	3,881	4	3,885	15
Other renewables <sup>(2)</sup>	924	-	924	4
<b>TOTAL</b>	<b>24,355</b>	<b>1,166</b>	<b>25,521</b>	<b>100</b>

(1) 100% Consolidated data for the whole year of Edison group (excluding Edipower).

(2) Without EDF Énergies Nouvelles data in Italy amounting to 445MW and 623GWh respectively.

In 2012, the EDF Group's net electricity generation in Italy was 25.5TWh, which accounted for 9% of net electricity generation in Italy, whilst gas activities in Italy accounted for 15.8Gm<sup>3</sup> or 21.3% of Italian gas demand (15.2Gm<sup>3</sup> and 19.6% in 2011).

### Gaz and hydrocarbons

#### Gaz and Hydrocarbon production (Mm<sup>3</sup>)

	2012
Gaz in Italy	611
Gaz abroad	1,906
Oil in Italy	1,809
Oil abroad	1,738

The Group's hydrocarbon production activity through Edison in Italy and abroad rose from 2011 to reach 2.5Gm<sup>3</sup> for gas generation and 3.5 for oil production.

1. Savings shares do not confer any voting rights but entitle the bearer to a share in company profits and grossed up dividends.



## 6.3.2.3 Electricity generation

The Edison Group's installed production capacity was 7.7GW at 31 December 2012 with net electricity generation in Italy of 24.4TWh in 2012. Compared with 2011, installed capacity fell by 3.8GW and generation by 8.8TWh, mainly as a result of the sale of Edipower. Edison's current generation fleet is comprised of 47 hydropower plants, 22 thermal power plants, 32 wind farms, 9 photovoltaic power plants and one biomass plant. The mix of electricity generation is balanced between combined cycle gas (CCGT), hydropower, wind power and solar power.

Internationally, Edison has a well-established presence in Greece, where it is the second-largest electricity operator through ElpEdison, a 50/50 joint venture with Hellenic Petroleum.

ElpEdison owns a 390MW combined cycle power plant in Thessaloniki and a 422MW plant in Thessaloniki, built by Edison.

In Brazil, Ibiritermo, a 50%-owned subsidiary of Edison, operates a 226MW CCG power plant.

### Hydropower

Edison runs a capacity of around 1,339MW from large hydropower facilities (including 125MW in Switzerland), 20MW from small hydroelectric power plants (Edison owns 47 hydropower plants in total). Hydropower represents 17% of the electricity generated by Edison.

In the hydropower sector, Edison is renovating its current fleet and plans to expand by increasing its installed capacity through the development of small hydropower plants. Three small hydropower plants with a total capacity of 20MW have recently been acquired in this respect.

### Other renewables

Through its wholly owned subsidiary EDENS, Edison operates on the renewable energy market with an installed capacity of 13MW in photovoltaic power and 471MW in wind power.

EDF Énergies Nouvelles operates in Italy, and increased its generating capacity over the year to 525MW gross wind energy (343MW net) and 123MW gross solar photovoltaic energy at 31 December 2012, 102MW net (see section 6.4.1.2.2 ("EDF Énergies Nouvelles")).

EDF ENR Solare, specialised in photovoltaic roof panel installations, was sold in October 2012 to the non-controlling shareholder that previously held 35% of the company's capital.

## 6.3.2.4 Edison's hydrocarbon sector business

The takeover of Edison allows the EDF Group, in implementing its gas strategy, to benefit from the experience that has been developed over the course of many years by Edison along the entire gas value chain, from exploration/generation to the direct sale of natural gas.

Edison's gas supply portfolio includes long-term contracts and in 2012 comprised approximately 15.6Gm<sup>3</sup> in purchased output (around 12.3Gm<sup>3</sup> of which was via pipeline and LNG) and more than 0.6Gm<sup>3</sup> of own output in Italy. Change in inventory and network losses were 0.4Gm<sup>3</sup>.

In 2012, Edison supplied 1.7Gm<sup>3</sup> of gas to the industrial sector, 2.3Gm<sup>3</sup> to the residential sector and 8.8Gm<sup>3</sup> to the thermal power sector; the last volume included Edison's own needs.

In 2011, due to the difficult gas market situation, Edison, like all other players in the sector, asked in 2010 suppliers to adjust their contractual conditions.

On 11 September 2012, Edison obtained a favourable ruling on the revision of a liquefied natural gas supply contract in Qatar. This decision, issued by the Court of Arbitration of the International Chamber of Commerce (ICC), has

had a positive impact on the 2012 EBITDA of €438 million. The arbitration process with Rasgas began in March 2011, although renegotiations took place in October 2010.

Moreover, on 1 October 2012, the Court of Arbitration of the International Chamber of Commerce issued a ruling in favour of Edison on the revision of the supply contract with Eni for 4Gm<sup>3</sup>/year of Libyan gas. This decision has a positive impact on Edison's 2012 EBITDA of €242 million.

In exploration-production, (E&P), Edison had 58 concessions and exploration permits in Italy and 37 abroad, and had around 50 billion cubic meters equivalent of reserves at 31 December 2012. Abroad, Edison's biggest asset is the Abu Qir gas field in Egypt for which Edison bought the exploration, production and development rights for an initial length of 20 years in early 2009, extendable by ten years. This deposit produced 1.5Gm<sup>3</sup> of natural gas and 1.7 million barrels of oil and condensate in 2012.

Edison is pursuing its exploration activity, in Italy and abroad particularly in the Norwegian Sea where hydrocarbon resources were discovered at the start of the second quarter of 2012. On 16 April 2012, a significant discovery of light oil, with estimated recoverable reserves of 160 million barrels, was made in Block PL418 in the Skarjell field, where Edison is present with a 15% share. In late April 2012, the success of the exploratory well drilled in Block PL435 (Zidane 2) confirmed the presence of gas reserves estimated at 18 billion cubic metres for the Zidane 1 and 2 fields.

### Gas infrastructures

Edison owns a 7.3% share in Adriatic LNG Terminal, which operates the Rovigo offshore regasification terminal (8Gm<sup>3</sup>/year). This terminal is powered via Qatari gas. The other shareholders are ExxonMobil Italiana Gas (70.7%) and Qatar Terminal Company Limited (22%).

Under the terms of the contract signed with Ras Laffan Liquefied Natural Gas Company Limited II (RasGas II), Edison owns 80%, i.e. 6.4Gm<sup>3</sup>/year, of the terminal's capacity.

Edison participates in two gas import infrastructure projects: GALSI (in which Edison has a 20.8% share), a gas pipeline connecting Algeria and Italy via Sardinia (annual capacity of 8Gm<sup>3</sup>) and the ITGI (Turkey-Greece-Italy Interconnection with annual capacity of 10Gm<sup>3</sup>), a gas pipeline transiting gas from Caspian Sea countries through Turkey, Greece, and Italy. A second component known as "IGB" (Greece- Bulgaria Interconnection) will connect Greece with Bulgaria.

## 6.3.2.5 Sales and marketing structure

In 2012, Edison sold 51.1TWh of electricity (down 29.2% compared with 2011), including 22.5TWh generated and 28.6TWh bought on the markets. Sales to end customers amounted to 18.1TWh, a drop of 23.0% on 2011. Edison serve more than 870,000 electricity customers and about 584,000 of gas at the end of 2012 on the business and residential customers segments.

In terms of supply, at the end of 2008 Edison had already started, and aims to continue for the coming years, a significant development of its electricity and gas sales to residential customers and small and medium-sized enterprises. The development of an end customer portfolio is part of the Group's strategy to promote upstream-downstream balance of its positions.

## 6.3.2.6 Energy efficiency in Italy

The Group is involved mainly through EDF Fenice in the field of energy efficiency and outsourced management and operation of cogeneration and tri-generation plants, electricity substations, thermal power plants producing both superheated water and steam for industrial use or site heating, cold generation power plants, compressed air generation units, and internal electricity distribution units, as well as various energy streams (hot air,

refrigerated air, industrial compressed air and gas). It also has an indirect presence through Siram (a wholly owned subsidiary of Dalkia International) in the fields of energy efficiency and optimisation, and environmental activities (sanitation, continuous facility surveillance, environmental engineering, lab analysis, etc.).

### EDF Fenice

EDF Fenice, a wholly owned subsidiary of EDF (through WGRM 4), operates electricity, heat, and compressed air production plants and associated distribution networks in Italy, Spain, Poland and Russia, along with environmental assets historically linked to the industrial sites of the Fiat Group when EDF purchased Fiat's stake in Fenice. Since 2006, EDF Fenice has pursued a policy of diversifying its customer base, supplying electricity and environmental services to industry and public sector, alongside building new cogeneration (combined generation of electricity and heat) and tri-generation (combined generation of electricity, heat and cold) facilities. In 2009, EDF Fenice's site in Russia furthered its international expansion. EDF Fenice now focuses on energy efficiency project development and performance contracts.

In 2012, EDF Fenice generated revenue of €481 millions.

In terms of energy assets, the EDF Fenice Group had electricity generation capacities of 504MW and heat generation capacities of 3,265MWth as at 31 December 2012. EDF Fenice has 50 thermal power (steam, superheated water and hot water), electricity and compressed air generation sites.

### Italy

The contracts with the Fiat Group still account for the majority of EDF Fenice's business. These contracts were renegotiated at the end of 2006 and, as a result, their duration was extended until the end of 2012 and new development projects were agreed upon. In December 2012, Fiat and EDF Fenice renewed their agreements on the supply of energy and environmental services for the Spanish and Italian sites of Fiat Auto and Fiat Industrial for a term of five years. The new contract type differs from the previous one in that it concentrates the joint efforts of both parties on the development of energy efficiency and cost reduction.

### Spain

EDF Fenice has operated in Spain since 2001 through its wholly owned subsidiary Fenice Instalaciones Iberica. This company offers operators in industry and the service sector technical and economic solutions in the field of energy efficiency. EDF Fenice Instalaciones Iberica currently has 190 employees and operates a generation capacity of 200MW. In 2012, EDF Fenice Instalaciones Iberica consolidated its position on the market by purchasing 82% of the capital of VAG SL (Valoritzacions Agroramaderes des Garrigues), a cogeneration plant in Catalonia with an installed capacity of 16.4MW, and pursued growth with the incorporation of a new turnkey energy facility engineering and construction business.

### Poland

EDF Fenice has a wholly owned Polish subsidiary, EDF Fenice Poland S.p.z.o.o. This company is involved primarily in thermal plant operation and outsourced management with combined electricity, heat and cold production. It also provides various energy and environmental services (hot or cold, compressed air, industrial gas, and waste and liquid effluent treatment). EDF Fenice Poland begun diversifying beyond Fiat by winning several new customers and is currently forming a partnership in services with EDF Polska.

### Russia

EDF Fenice also fully owns a subsidiary in Russia, Fenice Rus, created in November 2009 with the aim of marketing services in the field of energy efficiency to industrial companies. Since its creation, Fenice Rus has signed seven contracts with Avtovaz, Russia's leading car maker and finalised the building phase of three of them for. They are now fully operational. These projects have become a benchmark for customers and public authorities and have the advantage that they can be duplicated on other sites and in different business sectors. Against a backdrop of growing demand, Fenice enjoys an excellent reputation and extremely favourable growth prospects.

The existing partnership (50/50) between Fenice and Inter RAO within the InterEnergyEffect joint venture must develop to profit from synergies and seize the opportunities presented by the Russian market. In 2012, the partners agreed on the merger of Fenice Rus with InterEnergyEffect. Inter RAO's resulting interest in the new company will be symbolic (less than 1%), but a shared principle for growth will be established.

## 6.3.2.7 Regulated activities in Italy

### Gas transport and storage

Edison wholly owns the gas transport and storage company Edison Stoccaggio.

The company also offers storage services through the Cellino and Collalto concessions, located in Abruzzo and Veneto respectively.

Edison also intends to increase its storage capacity in Italy by developing new concessions, including those of San Potito-Cotignola.

In addition to handling transport for other operators, Edison Stoccaggio manages the Cavarziere Minerbio pipeline, which connects the national network to some 8 billion cubic metres of gas.

### Distribution

Gas distribution in Italy is regulated and supervised by the AEEG, the electricity and gas authority that establishes quality and safety parameters and network access rules.

Edison DG (Distribuzione Gas) is the company within the Edison Group dedicated to natural gas distribution.

Every year, Edison DG distributes around 300 million cubic metres of natural gas to 145,000 users in the north and centre of Italy.

## 6.3.3 Other international

The table below shows the installed capacity and generation of the EDF Group by segment at year-end 2012<sup>1</sup>:

	Installed capacity		Generation	
	MW	%	GWh	%
Nuclear	2,862	27	20,553	38
Thermal	7,590	70	31,347	58
Hydropower	81	1	308	1
Other renewables <sup>(2)</sup>	231	2	1,867	3
<b>TOTAL</b>	<b>10,764</b>	<b>100</b>	<b>54,075</b>	<b>100</b>

(1) Figures presented are reflecting the consolidation method used.

(2) Without EDF Énergies Nouvelles in Other International amounting to 2,974MW and 6,268GWh respectively.

### 6.3.3.1 Continental Europe

#### 6.3.3.1.1 Central and Eastern Europe

The Group operates in three countries of Central and Eastern Europe ("CEE"): (i) Poland (power generation, cogeneration and marketing), (ii) Hungary (cogeneration, delivery and marketing) and (iii) Slovakia (delivery and marketing).

The EDF Group also operates in these countries through its subsidiaries Dalkia International and Fenice, mainly in cogeneration, major urban heating systems and energy efficiency.

##### 6.3.3.1.1.1 Poland

The Group operates through the following four main subsidiaries:

- The Group controls the electricity generation company EDF Rybnik (formerly Ersal<sup>1</sup>) in the Rybnik region, which has an installed capacity of 1,775MW. EDF Rybnik owns 100% of EDF Energia (formerly Everen), which markets the electricity generated by the EDF Group's plants in Poland;
- The Group controls the EDF Wybrzeze (formerly EC Wybrzeze<sup>2</sup>) cogenerator in the Gdansk region. EDF Wybrzeze has an installed capacity of 333MW and 1,199MWth;
- The Group also controls the cogenerator of the city of Krakow, EDF Krakow (formerly EC Krakow<sup>3</sup>), which has an installed capacity of 460MW and 1,118MWth;
- Lastly, the Group controls the Kogeneracja<sup>4</sup> cogenerator of the city Wroclaw. Its installed capacity is 363MW and 1,124MWth. Kogeneracja owns 98.4% of EC Zielona Gora, a heat and power generation company whose installed capacity is 221MW and 296MWth.

EDF Paliwa (formerly Energokrak), owned by EDF Rybnik, EDF Krakow, EDF Wybrzeze and Kogeneracja, oversees the supply of coal and biomass to all EDF Group sites in Poland.

In the field of environmental protection, the EDF Group is a leader in biomass power generation. A decision was made in 2012 to invest in pollution control facilities (desulfurisation and denitrification).

In September 2012, EDF EN (see section 6.4.1.2.2 ("EDF Énergies Nouvelles")) announced the acquisition of a development company in Poland with a portfolio of projects to generate electricity from renewable energy sources such as wind.

In November 2009, EDF and Polska Grupa Energetyczna (PGE, Poland's leading electricity player, listed on the Warsaw Stock Exchange) signed an agreement to conduct pre-feasibility studies for the development and construction of nuclear reactors in Poland. The conclusions of these studies confirmed the interest of including nuclear energy in Poland's energy mix. At the invitation of PGE, EDF and Areva are studying the prospect of making a joint offer in response to a potential call for proposals by PGE.

Transactions bearing on the acquisition by EDF of EnBW shares in Poland were finalised on 16 February 2012. They involved EDF International's (indirect) acquisition of 32.45% of the capital of EDF Rybnik, 15.59% of the capital of the Kogeneracja cogenerator and 25% of the shared EDF Polska CUW service centre.

On 18 December 2012, EDF Group suspended its plans for building a coal-fired, supercritical plant totaling 900MW in Poland. The project will be subject to a number of conditions before being restarted, such as obtaining CO<sub>2</sub> emissions permits, which were expected to be delivered at the outset of the project as well as developments in the regulation on coal and biomass co-combustion.

##### 6.3.3.1.1.2 Hungary

In Hungary, the Group operates in the generation of heat and electricity through its subsidiary Budapesti Erőmu Zrt ("BE Zrt"), and in the marketing and distribution of electricity and gas through EDF Démász Zrt.

In 2012, the continuing slowdown in global economic activity and the markets' growing distrust of Hungary due to the unpredictability of national policies pushed a fragile and heavily indebted economy into recession. Foreign companies, and especially those in the energy sector, where the government is trying to increase its influence, were hit particularly hard by the new package of measures imposed by the Hungarian government.

##### BE Zrt

At 31 December 2012, EDF owned 95.6% of BE Zrt, a company generating heat and electricity. BE Zrt has a net installed capacity of 405MWe and 1,267MWth, and supplies 60% of Budapest's urban heat needs.

Until the end of 2008, almost all of BE Zrt's electricity output (1.7TWh/year) was sold to a single Hungarian purchaser, Magyar Villamos Művek Zrt (MVM), through three long-term power-purchase agreements (PPAs). These contracts were cancelled by the Hungarian government with no compensation at the end of 2008, after the European Commission demanded their termination on the ground that they constituted State aid contrary to competition law.

1. At 31 December 2012, EDF had a 97.3% indirect interest in the capital of EDF Rybnik.

2. EDF has a 99.8% indirect interest in the capital of EDF Wybrzeze.

3. EDF has a 94.31% indirect interest in the capital of EDF Krakow.

4. EDF has a 49% interest in Kogeneracja. The company is listed on the Warsaw Stock Exchange.

As of 1 January 2009, BE ZRt was nevertheless still able to sell its electricity, partly through an eight-year commercial contract and partly through a regulated cogeneration support mechanism, which the Hungarian government terminated prematurely on 1 July 2011.

In addition, the government decided in October 2011 to set by decree prices for heat previously governed by a commercial contract. Faced with a critical situation due to very unfavourable prices, the company managed to obtain acceptable payment conditions from the regulator for the 2011-2012 heating season. The new heating decree issued at the end of 2012 once again set suitable heating prices, but also introduced ex-post monitoring arrangements and imposed drastic limits on the profitability of the company in 2013.

The ensuing forced termination of long-term electricity sale contracts having caused significant prejudice to its shareholder, EDF International filed with the Permanent Court of Arbitration at La Hague a statement of claim against the Hungarian government for compensation for the loss of the PPAs (see section 20.5 ("Legal proceedings and arbitration")) on 30 December 2011. The losses arising from heat prices in 2011 were mentioned in this statement as a precautionary measure. An arbitration ruling is expected to be handed down in late 2014.

#### EDF Démász ZRt

EDF Démász ZRt is wholly owned by EDF. It distributes and markets electricity.

Regarding its marketing activity, under the universal service concept (as defined by a Hungarian government decree pursuant to the Hungarian Electricity Act of 2007), EDF Démász ZRt supplies electricity to individuals, small businesses and public institutions in the south-east region of Hungary. Since 31 December 2009, the company has marketed electricity and, more recently, gas across Hungary to customers who opted for the open market. EDF Démász ZRt has two trademarks in the Hungarian market: "EDF Démász" for residential customers and "EDF Energia" for business customers. In 2012, EDF Démász ZRt sold 3,160GWh to about 770,000 customers, of which 1,500GWh on the open market.

Regarding its distribution business, EDF Démász Hálózati Elosztó Kft, a wholly owned subsidiary of Démász ZRt, began operations on 1 January 2007, in response to the legal requirement that network activities be separated from generation/supply activities. It owns the electricity network assets (about 32,000km of high-, medium- and low-voltage lines) and operates the regulated distribution business in Hungary's south-east region (19.6% of the country). In 2012, it supplied 4TWh to 775,066 delivery points. The introduction in January 2013 of a new network tax (€0.44 per metre) will weigh heavily on the company's results.

At the end of 2011, EDF Démász commissioned a 1.2MW power plant fuelled by biogas derived from pig manure. The EDF Démász group is aiming to consolidate its position and is looking into proposals to increase its generation capacity.

#### 6.3.3.1.1.3 Slovakia

The Group has been present in Slovakia since 2002 through a 49% stake in the capital of distribution and marketing company Stredoslovenská Energetika, a.s. ("SSE") alongside the Slovak National Property Fund.

In 2012, Slovakia's macroeconomic situation was satisfactory for the third consecutive year<sup>1</sup>.

SSE operates in central Slovakia in the province of Žilina, serving about a third of the country's area. In order to be in compliance with regulatory requirements in respect of the separation of network activities, SSE's regulated distribution activities were transferred on 1 July 2007 to its wholly owned subsidiary Stredoslovenská energetika – Distribúcia a.s. ("SSE-D"). At 31 December 2012, SSE-D owned nearly 33,400km of high-, medium- and low-voltage power lines and served 722,000 delivery points.

In 2012, SSE supplied 4,852GWh to about 630,000 customers<sup>2</sup> and launched a gas marketing business. SSE has a few small generation assets – solar power plants with a capacity of 10MW<sup>2</sup>, three small hydropower plants with a capacity of 3MW<sup>2</sup> and a 50MW<sup>2</sup> gas turbine dedicated to the sale of system services to transmission system operator SEPS.

SSE is aiming to consolidate its upstream position in the Czech and Slovak markets, and is looking into projects including power generation from renewable sources – small hydro, biomass and microgeneration plants.

#### 6.3.3.1.2 Russia

The EDF Group operates in Russia in the field of energy services, through EDF Fenice and its Russian subsidiary Fenice Rus, as well as in the field of electricity distribution, through ERDF-I and its Russian subsidiary ERDF Vostok, both wholly owned.

Fenice Rus was established in November 2009 to market energy services to industry, particularly in the field of energy efficiency. EDF Fenice also owns 50% of InterEnergioEffect, a joint venture with Russian company Inter RAO (see section 6.3.2.6 ("Energy efficiency in Italy")).

ERDF Vostok was established in January 2012 to house ERDF-I's operational activity in Russia. In 2011, through ERDF-I and MRSK, its Russian counterpart, ERDF finalised an agreement bearing on the management of TRK, the Russian electricity distribution company for the Tomsk region. After an initial agreement on 18 March 2011 covering the main terms and conditions, and after due diligence, ERDF and MRSK signed an agreement on strategic cooperation on 17 June 2011, to which are appended the final terms of the management contract. On 28 February 2012 ERDF Vostok and MRSK Holding signed a delegated management agreement entrusting TRK's general management to ERDF Vostok. On 21 June 2012, at the Saint Petersburg International Economic Forum, a tripartite cooperation agreement was signed between Tomsk Polytechnic University, MRSK Holding and ERDF. It governs cooperation in research and training.

The Group also continued its collaboration with other major players in Russia's electricity sector: Rosatom, Inter RAO, RusHydro and Gazprom.

With Rosatom, a cooperation agreement signed in 2010 laid the foundations for a strategic partnership. The four areas of cooperation are nuclear fuel, R&D, the sharing of expertise in the fields of generation and engineering (strengthened since the Fukushima accident), and possible shared projects in other countries. The work is coordinated by a joint Steering Committee.

Cooperation with Inter RAO, which resulted in the signing of a Memorandum of Understanding on 17 June 2011, continues in several areas: energy efficiency, optimisation of generation and distribution assets, marketing, and projects in other countries.

At the June 2012 Saint Petersburg International Economic Forum, EDF and Gazprom signed a cooperation agreement on gas-fired electricity generation in Europe. Lastly, in partnership with Gazprom, EDF is contributing to the development of the underwater part of the South Stream project in which ENI and Wintershall also hold shares (see section 6.4.2.2.2 ("Infrastructure")).

#### 6.3.3.1.3 Benelux

Benelux is an area that includes major interfaces with the Franco-German electricity marketplace, with proposals for new links with Germany and Great Britain being examined. It is also an important centre for the European natural gas market due to its significant import and transit infrastructure, the Zeebrugge hub and the LNG terminal under construction nearby in Dunkirk. The EDF Group has two subsidiaries in Belgium: EDF Belgium (which owns 50% of the Tihange 1 nuclear power plant) and EDF Luminus (number two player in the Belgian market, with a balanced upstream/downstream portfolio). In the Netherlands, EDF has been present since 2009 with a combined-cycle gas plant.

1. Source: Coface.

2. Figures on a 100% basis.



## EDF Belgium

Through a long-term cooperation agreement with Electrabel in nuclear energy, EDF holds 50% in undivided co-ownership of the Tihange 1 nuclear power plant through its wholly owned Belgian subsidiary, EDF Belgium. The capacity attributed to EDF represents 481MW (or approximately 3% of Belgium's generation capacity). Tihange 1's generation, which is attributed to EDF Belgium, is sold to EDF Luminus through a long-term contract that will expire in 2015.

In 2012, EDF Belgium experienced a decline in nuclear power generation at the Tihange 1 plant following an unplanned outage caused by a short circuit on the Tihange 1 alternator in early February. After a period during which it operated at 50% of capacity, the plant resumed full operation in June.

As part of an investment plan presented in July 2012, the Belgian government confirmed both the gradual exit from nuclear energy (as provided by the 2003 law) and its intention of authorising the extension of the lifetime of Tihange 1 by ten years, under conditions yet to be determined.

## EDF Luminus in Belgium as of end 2012

	Installed capacity		Generation	
	MW	%	GWh	%
Nuclear (excluding 100MW drawing rights on Chooz B)	419	21	2,548	48
Thermal	1,429	70	2,297	43
Hydropower	73	3	288	5
Other renewables	117	6	225	4
<b>TOTAL</b>	<b>2,038</b>	<b>100</b>	<b>5,358</b>	<b>100</b>

EDF Luminus owns 10.2% (419MW) of Belgium's Tihange 2 and 3 nuclear power plants (commissioned in 1983) and the Doel 3 and 4 plants (commissioned in 1995), which have a lifetime of 40 years. EDF Luminus also has 100MW in drawing rights on the French Chooz B nuclear power plant, on the basis of guaranteed baseload generation in accordance with the average availability of the French fleet.

In 2012, EDF Luminus saw its nuclear generation decline due to the unplanned outages of two nuclear tranches at Doel 3 and Tihange 2. Safety analysis following the discovery of micro cavities in the steel of the two reactors is ongoing, and a complete closure cannot be ruled out.

EDF Luminus's generation fleet consists mainly of power plants fired by natural gas, and a few run-of-river hydropower plants. In addition, two peak thermal power plants are operated in Monsin, Ham and Angleur. The Angleur plant has been commissioned, and represents a capacity of 128MW that reaches its maximum power in nine minutes. These plants are critical in meeting big variations in demand for electricity.

EDF Luminus also operates four combined-cycle power plants in Angleur, Ringvaart, Seraing and Ham. In the latter, recoverable heat from the steam turbine cycle is used for the district heating network. It is noteworthy that the Ringvaart plant set a record of more than 5,000 days without an incident in 2012.

## EDF Luminus

EDF owns 63.5% of EDF Luminus via its subsidiary EDF Belgium. The company's Belgian identity has been preserved, in accordance with EDF's wishes. Thanks to the presence of Belgian shareholders (36.5% of capital), representing the country's different regional balances, this position allows EDF to contribute to the development of competition in the Belgian market. To strengthen the subsidiary's local roots, EDF and EDF Luminus signed a tripartite partnership with the Province of Liège and the cities of Liège and Seraing on 13 July 2012, bearing on cooperation in the fields of electric mobility, energy efficiency, solidarity, training and R&D.

The regulatory environment in which EDF Luminus operates, both upstream and downstream, changed significantly in 2012. The key changes were:

- the introduction of a feed-in tariff as of 1 January 2012;
- a temporary freeze of indexed electricity and gas prices as of 1 April 2012;
- an increase in the nuclear tax from €250 million to €550 million for the sector as a whole.

EDF Luminus has the second-largest share of the Belgian energy market. It accounts for nearly 12% of the country's installed capacity, with 2,038MW.

EDF Luminus generated 5,358GWh of electricity in 2012. It employs approximately 1,000 people.

EDF Luminus is currently working on two new gas-fired power stations: Navagne (Wallonia) and Nest-Energy (Flanders) (each with potential installed capacity of 890MW).

In October 2012, EDF Luminus initiated a process aimed at selling the Nest-Energy project, in accordance with commitments made by EDF to the European Commission as part of the acquisition of Segebel (majority shareholder of EDF Luminus, formerly SPE) in 2009. Various procedures (see section 20.5 ("Legal proceedings and arbitration")) for a waiver of this commitment are pending. In addition, EDF sent the Commission a request for a waiver of its commitment in respect of Nest-Energy. EDF Luminus operates in renewable energy, with onshore wind turbines on 22 sites in Wallonia and Flanders. The company is among the leaders in wind power in Belgium, with an installed capacity of 117MW and a target of 225MW in 2015. In 2012, EDF Luminus acquired existing wind projects from Spy and Ciney, with a capacity of 20MW, and obtained a building permit in Thuin for a capacity of 38MW.

Under its "Luminus" brand, EDF Luminus delivers electricity and gas to approximately 1.7 million delivery points for business and residential customers in Belgium. In addition to its operations in Flanders and Wallonia, its entry into the Brussels residential market in 2012 offered EDF Luminus a new opportunity to strengthen its presence in Belgium.

## The Netherlands

Through a joint venture, Sloe Centrale BV, EDF and Delta own an 870MW gas-fired power plant in the south-west Netherlands, whose two 435MW units were commissioned in 2009.

In 2011, EDF and Delta explored the possibility of building a new nuclear power plant in Borssele, in the Dutch province of Zeeland. On 23 January 2012, Delta announced its decision to suspend the project for a few years, saying that the conditions for developing the project had not been met.

### 6.3.3.1.4 Switzerland

The Group is present in Switzerland through its investments in Alpiq Holding SA (25%) and in hydropower generation facilities in Chatelot (50%) and Mauvoisin (10%).

The EDF Group has a 25% stake in Swiss energy company Alpiq Holding SA (Alpiq). Alpiq is a leading player in the European energy market. It was born of the merger in 2009 of Swiss utilities Atel and EOS, and the contribution by EDF of its energy rights and its share of the capacity and loads of the Émossion dam in Switzerland. It is an electricity company of significant size at the heart of the European electricity market, active in the generation, sale and trading of energy, as well as in services. Alpiq is roughly supplying more than one third of the electricity in Switzerland.

Based on its 2012 revenue (CHF12,710 million), Alpiq is Switzerland's leading electricity company (137TWh sold in 2012, mainly in wholesale markets and to key European customers in southern Europe and in Central and Eastern Europe). Alpiq also supplies approximately 100,000 customers in north-west Switzerland. The business has major generation assets in Switzerland and in countries where Alpiq is developing its presence. In 2012, Alpiq had a total installed capacity of 6,441MW and output of 19,988GWh (excluding long-term contracts), as shown in the table below.

	Installed capacity <sup>(1)</sup>		Generation <sup>(1)</sup>	
	MW	%	GWh	%
Nuclear	775	12	5,751	29
Thermal	2,578	40	8,067	40
Hydropower <sup>(2)</sup>	2,804	44	5,696	28
Other renewables	284	4	474	3
<b>TOTAL</b>	<b>6,441</b>	<b>100</b>	<b>19,988</b>	<b>100</b>

(1) Figures on a 100% basis.

(2) Including small hydro.

As part of its restructuring plan, Alpiq sold to Delmi, on 24 May 2012, its 20% stake in Italian company Edipower for approximately €200 million. Similarly, Alpiq sold EVT, its German energy transmission technology subsidiary for a total of €305 million, including dividends and reserves, on 7 September 2012. On 20 December, Alpiq concluded a contract for the sale of 15% in the proposed pumped storage power plant in Nant de Drance, in which it will retain a 39% interest. Alpiq has also signed agreements bearing on the sale of its stakes in Romande Energie and Repower.

In addition, Alpiq scaled down its international sales activities, sold Finnish company Energiakolmio, decided to exit the retail market in Italy and Spain, and opted to close down the Spreetal plant in Germany at the end of the 2012. Alpiq is preparing for the sale of its foreign renewable energy assets.

The Board of Directors has appointed a new Chief Executive Officer, who took office on 1 January 2013, replacing the Chairman of the Board of Directors, who was previously acting CEO, and a new Chief Financial Officer in October 2012 following the retirement of the previous incumbent.

Pursuant to the law on electricity supply ("LApEl"), Alpiq transferred its 1,800km of high-voltage lines to Swissgrid on 3 January 2013, in consideration for which it received Swissgrid shares and a credit of more than CHF400 million, the repayment of which will be staggered over several years, with an initial payment of CHF220 million due in the first half of 2013.

However, despite the various measures taken and disposals carried out, market conditions remain difficult, and Alpiq closed 2012 with a loss of CHF1,086 due to further valuation adjustments in the amount of CHF1.4 billion.

As a result, a strengthened restructuring and cost-cutting plan, with target savings of more than CHF100 million per annum, has been adopted. A review is being performed to identify further prospective disposals, including lignite-fired plants in Kladno and Zlin in the Czech Republic, and

Alpiq has restructured by business line (generation, marketing & trading, energy services).

Other measures are being examined, particularly to reinforce equity through subordinated debt.

### 6.3.3.1.5 Austria

Austria is located in the centre of the electricity and, especially, gas interconnections of the European network. It is strongly integrated with the market in Germany, and is therefore of interest to foreign investors. Hydropower plants represent 70% of Austria's fleet of generation facilities.

EDF International owns 25% of the holding company ESTAG (corresponding to a non-controlling interest with blocking power in Austrian law). The Austrian state of Styria owns the remaining ESTAG shares, and has entered into a shareholders' agreement with the EDF Group, giving EDF greater powers than its non-controlling interest with blocking power. ESTAG heads a group of Austrian companies operating in the fields of energy, waste treatment and associated services. Centred around Styria, the ESTAG Group is also developing its business in the other Austrian states and some neighbouring countries. Its two main subsidiaries are Stewea-Steg, the leading electricity distributor and marketer in the state of Styria, and Steirische Gas und Wärme (STGW), which ensures the transmission, distribution and marketing of gas and heat in the same region.

### 6.3.3.1.6 Spain

On 31 December 2012, the EDF Group held 31.48% of the capital of Elcogas. Elcogas operates an innovative Integrated Gasification Combined Cycle ("IGCC") "clean coal" plant at Puertollano with a gross capacity of 320MW powered in IGCC mode by the gasification of local coal and petcoke. In

In addition to natural gas, this installation allows the use of coal and petroleum coke, which produce atmospheric emissions that are far below European standards. This facility is the largest solid fuel power plant of this type in the world. In 2012, Elcogas produced 1,207GWh<sup>1</sup>, of which 993GWh in IGCC mode. Since 2010, the Puertollano installation has included a pilot CO<sub>2</sub> capture and hydrogen production unit. It is the world's first industrial-sized pilot project associated with an IGCC. With a capacity of 14MWth, the pilot unit can handle 2% of the syngas produced by the gasifier, capturing 4.17 tonnes of CO<sub>2</sub> and producing between 83 and 207.5kg of H<sub>2</sub> per hour. The process involves capture before combustion, upstream of the combustion turbine, based on chemical absorption using activated amines.

The Group also operates in the Spanish market through companies belonging to Spanish subsidiaries: Fenice Instalaciones Iberica (see section 6.3.2.6 ("Energy efficiency in Italy")), Dalkia España (see section 6.4.1.3 ("Dalkia")), SIF Energías Iberica and Fotosolar (see section 6.4.1.2.2 ("EDF Énergies Nouvelles")). EDF Trading operates in this market from its trading platform in London (see section 6.2.1.3 ("Upstream/downstream optimisation – trading")).

## 6.3.3.2 North America

The EDF group operates throughout the North American continent, with a strong presence in the United States.

### 6.3.3.2.1 North American markets

#### 6.3.3.2.1.1 United States of America

With total electricity generation of 4,106TWh<sup>2</sup> in 2011, the USA is the world's largest energy market. According to the Energy Information Administration ("EIA"), demand should increase by 0.7% per annum between 2010 and 2035<sup>3</sup>.

In 2011, the US' energy mix was comprised of 42% coal, 25% natural gas, 19% nuclear, 13% renewable energy and 1% from other sources of energy. Natural gas and renewable energy (especially wind) accounted for the largest share of new capacity in 2012.

Many challenges are facing the US electricity sector, which must make significant investments in production and transmission.

The EIA estimates that future electricity needs will require the provision of additional capacity of 235GW between 2011 and 2035. Over the same period, the EIA is forecasting the removal of 88GW of capacity, of which 49GW is coal. Natural gas is expected to account for 60% of capacity additions, compared with 29% for renewable energy.

Meanwhile, the Environmental Protection Agency ("EPA") is set to issue in 2013 a finalised version of major new regulations on greenhouse gas, particle, mercury and coal dust emissions, as well as the environmental impact of water cooling systems. The entry into force of EPA regulations on SO<sub>x</sub> and NO<sub>x</sub> emissions, scheduled to take effect in January 2012, have been delayed by litigation. Plans to reduce carbon emissions do not currently have enough support in the US for regulation to be passed.

Energy prices remain low due to the low prices of natural gas, stemming from the recent increase in shale gas production and lower demand for electricity due to the economic recession. In May 2012, the Henry Hub natural gas price reached its lowest level since 1999. According to the EIA, the US hopes to become a net exporter of liquefied natural gas in 2016, and a net exporter of natural gas overall in 2021.

#### 6.3.3.2.1.2 Canada

In 2010, electricity generation in Canada totalled 589TWh. Hydropower plants accounted for the largest part of electricity generated in the country (61%). Electricity networks in Canada and the US are fully integrated. The Canadian electricity market is structured by province and is relatively fragmented.

It is a small but sound market, in which provincial policies on carbon emissions and renewable energy play a determinant role. Ontario and Quebec are the two largest markets. British Columbia is a promising electricity market with anticipated growth. Canada, due to its stable electricity market, compliments the "stop and go" development of the US market. In Ontario, energy policies have been strengthened by the election of the Liberal Party in the provincial elections. In Quebec, following her election as Premier of Quebec in September 2012, the prime Minister announced her intention of closing the province's only nuclear power plant, Gentilly 2, operated by Hydro-Québec. Prior to this announcement, Hydro-Québec was considering significant repairs. By contrast, in Ontario, reactor 1 of the Bruce A site was connected to the grid on 19 September 2012, after 15 years of reconstruction.

#### 6.3.3.2.1.3 Mexico

In Mexico, the public electricity system had an installed capacity of 62GW in 2010, and gross output of 257.3TWh. Most of Mexico's electricity generation comes from thermal power plants. The percentages of coal and natural gas in the generation mix have been reversed in the course of the last decade: in 2009, electricity generation was composed of 52% natural gas (15% in 1999), 17% oil (47% in 1999), 11% hydropower, 12% coal, 4.5% nuclear, 3.0% geothermal and wind energy, and 0.5% diesel. While natural gas is playing an increasingly important role in the Mexican energy mix, Mexico remains a net importer of natural gas, particularly from the United States.

The main player in the market is the Comisión Federal de Electricidad (Federal Electricity Commission or "CFE"), a state-owned company that owns approximately 75% of the country's generation capacity.

The high prices of electricity for business and industrial companies, together with the favourable conditions of bank loans, make wind energy competitive, without the need for subsidies. The federal government aims to increase the share of renewable energy in the energy mix to 7.5% by 2017. In the first half of 2012, the Oaxaca II, III and IV wind farms entered service. They were joined towards the end of the year by the Oaxaca I and La Venta III farms. The entry into service of each farm added generation capacity of approximately 100MW.

### 6.3.3.2.2 The EDF Group's activities in North America

#### EDF's strategy in the United States

The EDF Group's strategy focuses on the sectors of high added value in the US and, more generally, in North America, with the aim of reinforcing its existing positions, benefiting from the Group's expertise and resources, and improving financial performance.

To this end, in 2012, EDF reorganised its administrative functions to support its business lines and benefit from synergies and better coordination of the Group in North America.

EDF's activities in North America mainly comprise:

- nuclear power generation, through Constellation Energy Nuclear Group (CENG), 49.99% owned by EDF, which operates of five nuclear reactors in the US, with a total installed capacity of 4.1GW<sup>1</sup>, and UniStar, a wholly owned subsidiary of EDF, which focuses on new nuclear developments;

1. Figures on a 100% basis.

2. Source: U.S. Energy Information Administration, Monthly Energy Review, November 2012.

3. Source: Energy Information Administration, Annual Energy Outlook 2012, updated June 2012.

- renewable energy, in particular wind and solar power, mainly in the USA (through enXco, a wholly owned American subsidiary of EDF Énergies Nouvelles, which became EDF Renewable Energy on 20 August 2012 as part of the process of integration into the Group), and, to a lesser extent, in Canada and Mexico (through EDF Énergies Nouvelles), where the Group has 2.3GW of installed capacity. EDF Renewable Energy manages an additional 7GW through operation and maintenance (O&M) contracts;
- transmission and optimisation, across the entire value chain in North American gas and electricity markets, through EDF Trading.

The EDF Group has more than 4.3GW<sup>1</sup> of installed capacity. It also manages, on behalf of third parties, more than 33GW of installed capacity under operation and maintenance or optimisation services.

Moreover, UniStar Nuclear Energy ("UNE") is continuing its work towards filing a Construction and Operating License Application ("COLA") for a proposed new nuclear reactor on the site of Calvert Cliffs 3 in Maryland, using the US EPR technology. UniStar has recently reviewed the project's development costs and conditions to take into account the current uncertain and unfavourable market conditions. In December 2009, UNE suspended its COLA for the proposed new nuclear reactor on the Nine Mile Point 3 site (New York State). In addition, UNE provides services to Pennsylvania Power & Light ("PPL") under its COLA for Bell Bend (Pennsylvania). PPL operates two nuclear power plants (Susquehanna 1 and 2, Pennsylvania).

EDF no longer holds any shares in Exelon. The Group announced on 11 January 2013 the sale as of end-2012 of its 1.6% interest in the capital of Exelon Corporation for an amount of approximately USD470. It held this interest as a result of the merger between Constellation Energy Group ("CEG") and Exelon.

#### 6.3.3.2.2.1 Existing Nuclear business unit: Constellation Energy Nuclear Group (CENG)

On 6 November 2009, the EDF Group and CEG established Constellation Energy Nuclear Group (CENG). Since the merger between Exelon and CEG, the EDF Group and Exelon have owned stakes of 49.99% and 50.01% respectively in CENG. Aside from the financial dimension, EDF's holding in CENG enables EDF to participate in the American nuclear industry and to exchange best practices.

#### Organisation and governance rules of CENG

CENG is governed jointly by a Board of Directors of ten members, five of whom are appointed by the EDF Group and the other five, including the Chairman, by Exelon. CENG is jointly managed by Exelon and the EDF Group, excluding issues of safety, security and the reliability of nuclear facilities and compliance with environmental regulation, as well as the appointment of senior managers, for which Exelon has a casting vote as it appoints CENG's

Chairman. In addition to the Chairman, the Chief Nuclear Officer and the Chief Executive Officer of CENG are also required to be US citizens. The EDF Group appoints the Vice-Chairman of the CENG Board of Directors.

Pursuant to the operating agreement, the CENG's Board of Directors has a standing audit committee, a standing nuclear safety and operations committee, and a standing governance and compensation committee comprised of an equal number of Exelon-appointed and EDF Group-appointed directors.

Pursuant to the operating agreement and subject to certain exceptions and conditions, each of the parties in this agreement may transfer their interests in CENG to a third party, subject to the other party's right of first refusal.

Also, CENG solicits Exelon for the provision of various administrative services. The contract in force, which expires on 31 December 2017, comprises both a fixed part, subject to an annual increase, and a variable part based on consumption.

On 16 January 2012, Exelon, CEG, EDF and some of their subsidiaries finalised an agreement concerning a number of modifications to the CENG operating contract. The amendments to the operating contract comprise: the right for EDF to appoint CENG's CFO, restrictions for EDF and Exelon concerning the payment of indemnities to certain CENG directors, the obligation for Exelon not to hire CENG and EDF employees for a period of two years from the merger's finalisation date, to address questions concerning CENG's relations with providers of Exelon's goods and services liable to change the provisions of the operating contract relating to the commercial relations between CENG and Exelon, and finally EDF's and CENG's obtaining certain audit rights to validate the application of the provisions of the operating contract. The agreement with Exelon also includes the indexation terms of sums invoiced by CEG and Exelon to CENG for the supply of administrative assistance services.

#### CENG's nuclear activities (nuclear electricity generation and operation)

CENG's nuclear business is undertaken within an historically predictable regulatory environment, under the control of the US Nuclear Regulatory Commission.

#### Capacity

CENG owns and operates five nuclear reactors, spread across three operating sites. The power plants, which have a combined capacity of 4,140MW, are shown in the table below. The duration of licences for Units 1 and 2 of Calvert Cliffs, Unit 1 of Nine Mile Point and R.E. Ginna has been extended from 40 to 60 years. The duration of the licence for Unit 2 of Nine Mile Point has been extended from 40 to 58 years.

Reactors	Location	Capacity (in MW)	% interest	Company-owned capacity (in MW)
Calvert Cliffs 1	Calvert County (Maryland)	889	100	889
Calvert Cliffs 2	Calvert County (Maryland)	864	100	864
Nine Mile Point 1	Scriba (New York)	613	100	613
Nine Mile Point 2 <sup>(1)</sup>	Scriba (New York)	1,197	82	982
R.E. Ginna	Ontario (New York)	577	100	577
<b>TOTAL</b>		<b>4,140</b>		<b>3,925</b>

(1) CENG owns 82% of this unit (i.e. 982MW of the unit's total capacity of 1,197MW). The 18% of Unit 2 of Nine Mile Point not owned by CENG belongs to the Long Island Power Authority (LIPA). LIPA receives 18% of the capacity and electricity generated by Nine Mile Point Unit 2, in consideration for payment to CENG of its share of the costs incurred by the unit, and is responsible for its 18% share of costs of dismantling the unit. CENG and LIPA are each required to provide specific funding for Nine Mile Point 2.

1. Figures on a 100% basis.



# 6 | Overview of activities

## Presentation of the EDF Group's international business

### Output and technical performance

CENG's stations generated 24.9TWh of nuclear electricity on 31 October 2012.

(in TWh)	Generation		Load factor	
	2011	2012	2011	2012
Calvert Cliffs 1	7.6	6.1	100.9%	77.9%
Calvert Cliffs 2	6.8	7.5	91.7%	99.2%
Nine Mile Point 1	4.6	4.8	84.0%	89.0%
Nine Mile Point 2	7.8	6.9	95.4%	79.2%
R.E. Ginna	4.3	4.6	84.7%	91.2%

### Nuclear Safety

Nuclear safety is the highest priority of the operating and maintenance of CENG's nuclear power stations. The Steering Committee, managed by the Chief Nuclear Officer, is in charge of the rules of conduct and processes necessary for the company to meet its safety targets. These measures aim to promote model behaviour, personal responsibility, problem identification and resolution, risk analysis and appropriate decision-making, all to help create a safe working environment. CENG's nuclear power stations comply with the federal Clean Water Act.

### Nuclear fuel

#### Supply of nuclear fuel

The supply of fuel for nuclear generating stations includes the:

- purchase of uranium (concentrates and uranium hexafluoride);
- conversion of uranium concentrates to uranium hexafluoride;
- uranium hexafluoride enrichment;
- manufacture of nuclear fuel assemblies.

CENG has concluded long-term contracts for the purchase, conversion and enrichment of nuclear fuel, as well as for the building of fuel rod assemblies. These commitments should enable it to have sufficient quantities to meet its estimated needs for future years. These contracts extend from 2011 to 2028. The nuclear fuel markets are competitive markets and sometimes experience volatile prices, but the Group's management does not foresee any problems meeting its future supply needs.

#### Storage of spent nuclear fuel – Federal facilities

The Nuclear Waste Policy Act of 1982 (NWPAA) required the federal government, through the Department of Energy (DOE), to develop a repository for the disposal of spent nuclear fuel and high-level radioactive waste. In accordance with the NWPAA and with the standard contracts agreed between CENG and the DOE, CENG is bound to pay the DOE one thousandth (0.001) of one dollar per KWh of its net nuclear power output, to pay the costs of highly-radioactive waste (the DOE tax). This expense is recorded as "DOE tax of nuclear waste repository". However, even though the NWPAA and the contracts agreed between CENG and the DOE mention that the DOE should have taken charge of the highly-radioactive nuclear waste by 31 January 1998, at the latest, this deadline was not respected. The DOE's delay has meant that CENG has had to take measures with additional costs to arrange and maintain the storage of spent fuel on site at its three

nuclear sites. CENG has installed or plans to install independent spent fuel storage installations (ISFSI) at each of its sites.

In June 2012, the Court of Appeals for the District of Columbia, following requests by several states, asked the DOE to justify the collection of the tax on nuclear power generation aimed at replenishing the Nuclear Waste Fund. The same Court of Appeal overturned the 8 June 2012 Waste Confidence Decision.

#### Storage of spent nuclear fuel – On-site facilities

Calvert Cliffs has a licence from the NRC to operate an on-site independent spent fuel storage installation that expired in 2012. Sufficient storage capacity exists within the plant and currently installed independent spent fuel storage installation modules to contain the full contents of the core until 2015. Efforts are currently underway to renew the independent spent fuel installation licence and expand its capacity to accommodate operations until 2036.

The installation of an independent fuel storage unit at the Ginna plant was completed in 2010.

#### Cost of decommissioning nuclear facilities

CENG is obliged to decommission its nuclear power plants after these plants cease operation. In accordance with NRC Regulations and relevant state requirements, CENG has established reserves exclusively dedicated to cover the cost of plant decommissioning. CENG's Investment Committee decides on the general investment strategy of these reserves, including the allocation between the various asset classes.

#### 6.3.3.2.2 EDF Trading in North America

EDF Trading is one of the major players in the North American markets for electricity, gas, coal, freight, environmental products and optimisation of assets oil. EDF Trading is one of the largest providers of market services to wholesale energy and gas markets in North America, with production capacity of 26GW under management. It also sells about 2 million m<sup>3</sup> of gas per day and has storage capacity of approximately 1.3 million m<sup>3</sup>. The company actively trades renewable energy and biogas certificates in the US, on primary and derivatives markets. In addition, the company is a leader on the international coal market, with long-term contracts for operating coal terminals and rail and river transport for its exports to the East Coast and the Gulf of Mexico. In 2012, EDF Trading has strengthened its existing infrastructure for natural gas production capacity with the acquisition of natural gas fields and natural gas production capacity in Texas. EDF Trading is active in the marketing and transport of crude oil (see section 6.4.1.1 ("EDF Trading")).

1. Sources: IAEA and CENG's 2012 10-K.

### **North American electricity markets**

In North America, EDF Trading is a major player in the electricity market. It is one of the main providers of energy management services for energy generation companies in the US. EDF Trading manages generation capacity of over 26GW. It provides services in respect of fuel shipment, planning, sourcing and management, risk management as well as nodal pricing, and is active in North America's biggest electricity trading points. EDF Trading also optimises a portion of EDF's nuclear generation in the US.

In 2012, EDF Trading strengthened its presence in North America with power being delivered to 62 trading points, an increase of approximately 30% compared with 2011. EDF Trading has increased the number of its generation assets under contract on all deregulated markets in the United States. It has also signed its first energy management services contracts in the states of Colorado, Michigan and Maryland, and is a leading provider of energy management services in the United States in the Mid-West and the Rockies region.

### **North American environmental products market**

The company is very active in the US markets for environmental products, building on its experience in the European market. In the United States, its portfolio includes renewable energy certificates, biogas, carbon emissions and credits, and weather derivatives. In 2012, EDF Trading continued its partnership collaboration with EDF Renewable Energy through various business development opportunities related to renewable energy. EDF Trading also made preparatory steps for the introduction in early 2013 of a system of emissions quotas trading in California.

### **North American gas markets**

EDF Trading is a leader in the global gas and LNG wholesale markets, with extensive geographic operations. In 2012, it signed several new supply agreements in the US, and set up a new gas production business. It also expanded its commercial and industrial markets in North American gas.

### **North American coal and freight markets**

EDF Trading is a leader in global physical and financial coal markets. It is one of the leading importers of coal in Europe. The company has long-term contracts, coal terminals, a modern fleet of bulk carriers, rail and port capacity and long-term export capacity. EDF Trading operates a fully integrated freight and coal business, with numerous supply sources across the globe, including South Africa, Asia, the US and eastern Europe. It sources, stores, mixes, delivers and trades coal, and provides a comprehensive range of services spanning the entire supply chain, from the port of loading to the thermal power plant.

### **North American crude oil markets**

In 2012, EDF Trading has created a new line of logistics activities in the crude oil segment, complementing its business portfolio in North America. This new activity has made its first commercial transactions in five of the largest crude oil producing states in the United States (Texas, Louisiana, Oklahoma, North Dakota and Wyoming). In December 2012, EDF Trading purchased and transported crude oil by truck and pipeline. It aims to expand this activity in 2013.

#### **6.3.3.2.2.3 EDF Énergies Nouvelles in North America**

EDF Énergies Nouvelles, through its subsidiaries EDF Renewable Energy, EDF EN Canada and EDF EN Mexico, continued its expansion in North America, commissioning 1,035MW of wind, photovoltaic and biomass capacity. EDF

Énergies Nouvelles reinforced the visibility of its membership of the EDF Group by rebranding enXco as EDF Renewable Energy and enXco Service as EDF Renewable Services.

In addition, EDF Énergies Nouvelles continued its vigorous optimisation of its assets in North America by divesting of some of its assets with a total capacity of more than 320MW.

### **United States**

The Group is also present in the US through EDF Énergies Nouvelles' wholly owned subsidiary EDF Renewable Energy, an independent producer of renewable energy. EDF Énergies Nouvelles had 1,860.7MW of installed wind, solar and biogas capacity in the United States at 31 December 2012. In 2012, EDF Renewable Energy commissioned the following wind farms: Pacific Wind (140MW), Shiloh IV (102.5MW), Spearville 3 (100.8MW), Bobcat Bluff (150MW) and Spinning Spur (161MW). Meanwhile, EDF Renewable Energy completed the following solar projects: Eastern Long Island Solar (12.82MWp) and Pukana Solar (0.59MWp).

As part of its operations and maintenance business, EDF Renewable Services manages wind and solar facilities as a primary operator on behalf of third parties, with a total capacity of more than 7GW at 31 December 2012, with the gain of 3GW of new capacity in 2012.

### **Canada**

In 2008, EDF Énergies Nouvelles won a call for tenders issued by Hydro-Québec for the building of five wind farms with a total capacity of 954MW in Quebec. The Saint-Robert-Bellarmino farm (80MW) was commissioned in October 2012. Two other projects, Massif du Sud (150MW) and Lac Alfred Phase I (150MW), were commissioned in December 2012. The implementation programme continues until 2015. Construction of the Lac Alfred Phase 2 wind farm (150MW) began in late 2012.

Two other projects of a total capacity of 49.2MW are in development after a call for tenders by Hydro-Québec, won in December 2010.

EDF EN Canada also has a solar production fleet, Arnprior Solar Project, with a generation capacity of 23.4MW located in the province of Ontario.

### **Mexico**

In Mexico, a country with considerable wind development potential, EDF Énergies Nouvelles built and commissioned the La Ventosa wind farm in 2010. This 67.5MW site is located in the very windy region of Oaxaca, in southern Mexico.

In 2012, construction started on the Stinu Bii (164MW) and Santo Domingo (160MW) wind farm projects.

As of end-2012, the group has a total installed capacity in Mexico of 89.5MW.

### **6.3.3.3 Asia-Pacific**

The EDF Group's activities led by the Asia-Pacific division are focused on China and the fast developing countries in South and South-East Asia.

Investment in the electricity generation field in Asia and in China in particular is one of the EDF group's major industrial stakes. In nuclear power, in addition to the project to build and operate two EPR reactors, the new projects in this region are intended to give the Group access to technological innovations and, at the same time, allow it to develop its industrial expertise. EDF's goal is, thus, to maintain its competitive and technological advantages in the international arena for the global nuclear programme to equip the emerging countries and in order to renew the French fleet.

## 6.3.3.3.1 EDF Group's activities in China

The EDF Group has been operating in China for the past 30 years through advisory services in nuclear, thermal and hydropower technologies. Today it is one of the country's largest foreign investors in power generation, with investments in coal-fired thermal plants that have a total installed capacity of 4,9GW<sup>1</sup>. With the Taishan Phase I project (2 × 1,750MW), EDF became an investor in an electricity generation project of an EPR nuclear power plant in China. EDF has also formed partnerships offering new investment opportunities in nuclear power and the more technologically advanced coal-fired thermal facilities, as well as hydropower systems, electricity distribution, and renewable energies including wind power. To further its growth in China, in 2012 EDF decided to establish a holding company in China. The holding company should be in place at some point during 2013.

### Nuclear power generation activities

#### Daya Bay – Ling Ao Power Plants

After leading the design, construction and commissioning of two 1,000MW nuclear reactors in 1994, and then helping the Chinese Group China Guangdong Nuclear Power Holding Co., Ltd. (CGNPC) with the construction of two units of the Phase I Ling Ao plant (2 × 1,000MW), which came on line in 2002 and 2003, EDF now assists Daya Bay Nuclear Operation and Management with the operation of these facilities. The high level of performance achieved by these power plants since commissioning is one of the Group's main benchmarks in China.

EDF is currently helping one of CGNPC's subsidiaries, China Nuclear Power Engineering Company Ltd. (CNPEC), with Phase II of the Ling Ao project, which consists of building two additional 1,000MW units on the site. The two Ling Ao phase II units were commissioned in September 2010 and August 2011, respectively.

As at 31 December 2012, EDF owned 30% of the shares of Taishan Nuclear Power Joint Venture Company Limited (TNPJVC), the goal of which is to construct and operate two EPR technology nuclear reactors in Taishan, in the province of Guangdong. The duration of the company is set for 50 years, which is the current maximum permitted for a joint venture in nuclear power in China. Through this transaction, for the first time, the Group is an investor in nuclear power generation in this country. During 2012, CGNPC invited its local electricity partner to step in the project by selling him 19 of its 70% interests. On 26 November 2012, EDF International approved a capital increase, effective during 2013 to allow further project development.

The reactor dome for the second unit was installed on 12 September 2012. The reactor dome for the first unit was successfully installed on 23 October 2011, paving the way for electro-mechanical assembly. In particular, big components have been delivered and welding work on primary circuit ended in December.

Safety report has been sent to the Chinese Safety Authority in December 2012.

2013 will see further electro-mechanical assembly and the beginning of start-up trials.

### Partnership agreements

The general partnership agreement between EDF and CGNPC (Global Partnership Agreement or GPA) signed in 2007 was completed with a memorandum of Understanding on the implementation of this partnership signed on 29 April 2010. To this effect, EDF has established a facility in Shenzhen that houses all of its nuclear activities, very close to its Chinese partner. The objectives of this facility are to foster new investment projects in China and abroad and to promote EDF's model as an integrated A/E operator

while boosting French industry. To do this, experts are working, in particular, to further French codes and standards as well as its safety guidelines.

During 2012, EDF, Areva NP and CGNPC signed a cooperation agreement with a view to considering the development of a third generation nuclear reactor intermediate-size reactor.

EDF also signed a partnership framework agreement on 29 April 2010 with China National Nuclear Corporation (CNNC) to encourage cooperation on business management and certain technical areas.

In 2012, EDF renewed partnership framework agreements with Three Gorges and China Guodian Corporation, both of which are major players in the Chinese energy sector.

### Coal-fired thermal power generation activities

EDF has been involved in coal-fired power generation in China since 3 September 1997, the date on which the Laibin B power plant concession contract was signed and approved by the Guangxi government.

#### French Investment Guangxi Laibin Electric Power Company, Ltd. (Figlec)

As at 31 December 2012, EDF wholly owned French Investment Guangxi Laibin Electric Power Company, Ltd. (Figlec), the company that owns the Laibin B power plant (2 × 360MW of installed capacity) in the province of Guangxi and 85% of Synergie, the company responsible for its operation and maintenance, with the remaining 15% held by local partners. Laibin B was commissioned in November 2000 as part of a Build, Operate and Transfer (BOT) project, and will be transferred contractually to the Guangxi government in 2015.

#### Shandong Zhonghua Power Company Ltd. (SZPC)

As at 31 December 2012, EDF held a 19.6% stake in Shandong Zhonghua Power Company (SZPC), which owns three coal-fired power plants in the Shandong province, with a total capacity of 3,060MW. The other shareholders are Chinese companies including the Guodian Group and the Hong Kong electricity utility CLP. These power plants were commissioned progressively between 1987 and 2004.

#### Datang Sanmenxia Power Generation Company Ltd. (DSPC)

As at 31 December 2012, the EDF Group held a 35% stake in DSPC, owner of the Sanmenxia 2 (Province of Henan) power plant, commissioned in 2007, with installed capacity of 2 × 600MW, which uses a technology known as "supercritical coal". This investment is made through a joint venture with a lifespan set until 2039 by the Chinese authorities. The other shareholders are two Chinese companies including Datang, the majority shareholder in DSPC.

### New projects

Along with Chinese electricity generation operators, the Group is studying the opportunity of possible investments in new advanced technology coal-fired power plants known as "supercritical" or "ultra-supercritical".

### Activities in the gas sector

#### Beijing United Gas Engineering & Technology Company (Buget)

EDF made the decision to withdraw from BUGET. To this end, a share transfer agreement was signed with Tractebel Engineering SA on 16 September 2012. The sale will take place after approval of the Chinese authorities. As of 31 December 2012, EDF is still holding 20% of Buget.

<sup>1</sup>. Figures on a 100% basis.

### Hydropower generation activities

Present since 1985 in this segment, EDF is a recognised player. The Group operated as consultant on several structures installed in China and is looking again at investment opportunities or service offers that will respond to the needs of the Chinese party, which is developing an ambitious hydropower programme.

### R&D activities

EDF established an R&D facility in China. R&D activities pertain mainly to clean energy, energy efficiency, solar concentration, energy storage, carbon capture and storage, and digital simulation. During 2012 various R&D collaboration agreements were signed with prestigious Chinese universities and institutes and a service agreement was signed with China Metallurgical Group Corporation (MCC) in relation to "steel/concrete sandwich" construction technologies.

### Distribution activities

In keeping with the Group's policy, ERDF hopes to grow its business activities internationally, and especially in China. ERDF-I has had a presence in China since September 2011 and maintains the contacts and visits previously carried out with EDF China by promoting cooperation and potential projects with five main partners. ERDF-I hopes to bring its highly effective tools, methods and expertise to the table to support the management and performance of the network. The long-term goal is to get involved in managing the distributors to improve their performance.

#### 6.3.3.3.2 EDF Group's activities in South-East and in South Asia

The EDF Group's activity in South and South-East Asia is centred on the development of the electricity sector of the "Grand Mekong" area where Thailand and Vietnam are the economic engines and that offers "Independent Power Plants" (IPP) type opportunities, like the Nam Theun 2 complex in Laos and the combined-cycle gas plant Phu My 2.2 in Vietnam. EDF is also interested in design, construction and operation projects for new power generation plants, mainly thermal and hydropower in other South-East Asian countries.

##### 6.3.3.3.2.1 Vietnam

As at 31 December 2012, EDF owned 56.25% of Mekong Energy Company Ltd. (MECO), the owner of the Phu My 2.2 combined-cycle gas turbine power plant. Phu My 2.2 has a generation capacity of 715MW and was commissioned in 2005. It is the first Independent Power Producer ("IPP") project financed exclusively by foreign investors in Vietnam. MECO's other owners are international subsidiaries of Sumitomo Corporation (28.125%) and Tokyo Electric Power Corporation, Inc (Tepco) (15.625%), both Japanese companies. The term of the BOT contract (Built, Operate and Transfer) is 20 years. In 2005, EDF provided "turnkey" delivery of the power plant and today, MECO directs the operation.

The tender submitted by EDF on 28 July 2011 in response to an international call for tenders for the development, financing, construction and operation, for 25 years, of the 2 x 560MW Nghi Son 2 coal-fired power plant in northern Vietnam was not selected by the Ministry of Industry and Trade (MOIT), which named Marubeni/Kepeco the sole qualifying bidder on 23 March 2012.

EDF also expressed its interest in developing combined-cycle gas plants at the Omon site in South Vietnam.

##### 6.3.3.3.2.2 Laos

As at 31 December 2012, the EDF Group held 40% of Nam Theun 2 Power Company ("NTPC"), which owns the hydropower complex Nam Theun 2 with installed capacity of 1,070MW that was built by the EDF Group under a "turnkey" contract. NTPC's other shareholders are a Thai company, EGCO (Energy Generating Company) at 35%, and a Laos State company, LHSE (Lao Holding State Enterprise) at 25%. NTPC will operate the plant for 25 years under a concession contract entered into with the government of Laos. 95% of the electricity generated will be sold to Thailand and 5% to Laos. The Nam Theun 2 hydropower complex was commissioned in its entirety on 30 April 2010.

##### 6.3.3.3.2.3 Hydropower and thermal power generation activities

The EDF Group has expressed interest in participating in hydropower development studies and projects in Nepal, Cambodia, Laos, Myanmar, Papua New Guinea and the Philippines, as well as in thermal power projects in Thailand (natural gas) and Indonesia (coal).

### 6.3.3.4 Latin America, Africa and the Middle East

In Latin America, the EDF Group is present in the Brazilian market.

The Group aims to develop its operating modes in Africa and the Middle East, which vary from one geographic area to another, as a vector for growth in the new markets and rapidly developing countries. Additionally, it continues its work providing access to energy.

##### 6.3.3.4.1 Brazil

The EDF Group owns 90% of UTE Norte-Fluminense, the company which built and has operated the combined-cycle gas turbine at Norte-Fluminense in Macaé (the state of Rio de Janeiro), since 2004. This power plant has an installed capacity of 0.86GW. UTE Norte-Fluminense sells 725MW to Light under a Power Purchase Agreement (PPA) for a period of 20 years. The balance is sold on the open electricity market. UTE Norte-Fluminense sold 6,554GWh in 2012.

UTE Norte-Fluminense operates a solar power plant in the country, in Macaé, comprising 1,764 photovoltaic solar modules, which help to reduce CO<sub>2</sub> by around 250 tons a year. EDF plans to conduct other solar generation projects in Brazil.

To this end, on 23 February 2012 EDF Consultoria (a subsidiary of EDF) and Light Esco created a consortium for the design, construction and operation of a photovoltaic facility on the roof of the Maracã Stadium in Rio de Janeiro.

With a focus on long-term positioning, EDF signed a five-year cooperation agreement with Brazilian companies Eletrobras and Eletronuclear in the areas of hydropower and nuclear energy. The agreement sets the conditions for the joint conduct of feasibility studies for a new hydropower project in the state of Para in Brazil (a complex of five hydropower facilities on the river Tapajos, in Amazonia, with a total capacity of 10,682MW), and the sharing of experience and best practices for the rollout of the new Brazilian nuclear power programme.

The technical cooperation agreement signed between EDF, Eletrobras, Eletronorte and Camargo Correa that sets out the framework for the technical, economic and environmental feasibility studies for the hydropower complex in Tapajos was extended until July 2014. Specifically, it establishes



the organisation and division of roles and responsibilities between the parties and the schedule for each of the five facilities, up until the receipt of preliminary licences prior to public auctioning. The social and environmental studies related to the project, which are extremely important to the Group, began in 2012 after the Brazilian government adopted a temporary measure on 5 January 2012 to declassify certain protected areas. This measure was confirmed by a law on 25 June 2012. The agreement was then amended to include five new partners (GDF Suez, Néoennergia, Endesa, Cemig and Copel). Following this amendment, the nine partners created a research consortium on 1 August 2012.

The partnership with Eletrobras was reinforced with the signing of two supplementary cooperation agreements on 29 May 2012. One pertained to the development of international projects (outside Brazil) and the other to research and development activities.

### 6.3.3.4.2 South Africa

The South African government, which plans to double the country's installed power generation capacity (from 44 to 89GW), remains committed to the use of nuclear power in its future energy mix. The country's energy plan was enacted by the Ministry for Energy in May 2011, following the Fukushima accident. Under the plan, 9.6GW of nuclear power should be commissioned between 2023 and 2030. The nuclear power generation field requires technology of the highest level of safety possible. An interministerial committee met for the first time on 7 August 2012. Following this meeting, the office of the President named Eskom as owner/operator of the future facilities on 8 November 2012.

Eskom launched a call for tenders in June 2012 to educate future trainers as part of a future nuclear programme. In October the tender was awarded to the consortium between EDF and AREVA. The contract was signed in November 2012.

In the field of fossil-fuel fired power, a Memorandum of Understanding was signed on 2 March 2011 between EDF and Eskom to create the Eskom Power Plant Engineering Institute (EPPEI) in South Africa. Initial courses taken by the future engineers pertain to generation, while future courses will be expanded in the future to include electricity distribution and transmission.

In South Africa, EDF EN also gained a foothold in the wind power market when it was selected by the South African energy department for three wind power projects allocated as part of the second round of renewable energy tenders in South Africa, launched in August 2011. Construction of these three projects, representing a total capacity of 104MW, is scheduled to begin in 2013 (see section 6.4.1.2.2 ("EDF Énergies Nouvelles")).

### 6.3.3.4.3 Morocco

On 11 January 2012, in Rabat, EDF and the Moroccan National Electricity and Water Office ("ONEE") signed a general cooperation agreement concerning nine themes of common interest. The two operators aim to set up and develop a solid and lasting partnership in all areas of the value chain, including hydropower, thermal power and renewable energy generation. Their partnership also includes upstream-downstream optimisation, training and regional cooperation.

2012 marked EDF Énergies Nouvelles' entry in the Moroccan renewable energy market. The consortium headed by EDF Énergies Nouvelles, in partnership with the Japanese group Mitsui & Co, was selected in a call for tenders sponsored by Morocco's National Electricity and Water Office (the ONEE) for the 150MW Taza wind project. Located in northern Morocco, the Taza project will be equipped with 50 Alstom turbines, each having a 3MW unit capacity (see section 6.4.1.2 ("EDF Énergies Nouvelles")).

### 6.3.3.4.4 Senegal

The very serious crisis in the Senegalese energy sector led the government of this country to ask EDF to assist in diagnosing the situation and defining an emergency plan to permanently re-establish the quality of service.

In 2012 EDF continued its work under a cooperation agreement signed on 17 December 2010 that covers all segments: generation, distribution and supply.

EDF's efforts focus mainly on renovating the generation fleet of Sènelec (the Senegalese National Power Company), which will help to limit the use of the least well-performing producers.

### 6.3.3.4.5 Middle East

The Thermal Power Generation and Engineering Division with the Transmission System Engineering Centre (CIST) carries out engineering and consultancy activities for building transmission infrastructures and conducting studies of networks in the United Arab Emirates with its Abu Dhabi branch.

In addition, EDF is interested in developing combination power generation / seawater desalination plants (IWPPs) in this region.

#### 6.3.3.4.5.1 Saudi Arabia

EDF and Areva opened a joint office in Riyadh in June 2012 with a view to working with the Saudi government, which is planning to develop an energy policy that focuses on replacing fossil fuels with nuclear power and renewable energy sources (solar power). KACARE (King Abdallah City for Atomic and Renewable Energy) is the entity in charge of developing a programme that will entail 17.6GW of nuclear power and 41GW of solar power by 2032. The programme aims to cover 20% of the country's power needs.

#### 6.3.3.4.5.2 Israel

In 2012 EDF drew up an agreement with Israeli Electric Power (IEC) identifying possible areas of cooperation between the two companies. EDF had already been contracted to provide research and management assistance for the construction of two pumped storage plants in Gilboa (300MW) and Manara (200MW).

EDF Énergies Nouvelles operates in Israel through its subsidiary EDF Énergies Nouvelles Israel, which has entered into a strategic partnership with Arava Power, a pioneer in the Israeli solar energy industry. Following the 2011 acquisition of five projects in development totalling 39.3MWc, in January 2012 the subsidiary was selected in a 7MWc call for tenders launched by the ILA (Israel Land Administration). All in all, at year-end 2012 70MWc in facilities were in the construction stage and almost 120MWc were in the development stage for this rapidly developing country (see section 6.4.1.2 ("EDF Énergies Nouvelles")).

### 6.3.3.4.6 Access to Energy Mission

Since 2001, the Group has been developing a programme to provide access to energy in developing countries. In rural areas often far from electricity networks, the programme operates by setting up energy service companies that supply families and economic and administrative activities such as education, health, etc. (in Morocco, Mali and South Africa). In late 2012, six companies of this kind were created in five countries (Mali, Morocco, South Africa, Botswana and Senegal). Around 450,000 people benefit from the energy services provided by these companies.

In all of these operations, EDF acts in partnership with other industrial players such as Total or local companies such as Fres Calulo in South Africa, BPC in Botswana and Matforce in Senegal in an effort to enable local players to take over when conditions for profitable, sustainable operations are met.

In South Africa, the company KES (Kwazulu Energy Services) is 50% owned by EDF and 15% owned by local operator Calulo, with the remaining 35% being held by Total. Created in 2002, KES initially developed its business through photovoltaic kits in KwaZulu-Natal. Since 2007, KES has expanded its activity on the Eastern Cape. In late 2012, KES supplied electrical power and gas for cooking to around 125,000 people with a goal of 270,000 in the next three to four years in the two provinces.

In Botswana, EDF has been chosen by BPC, the national electricity network operator, to assist it as strategic partner in the implementation of its decentralised electrification programme, essentially using photovoltaic systems over the entire area. EDF holds 45% of BPC Lesedi, a local subsidiary owned jointly with BPC. This company is responsible for rolling out the programme (300,000 to 400,000 people over the next five years) relying on a network of franchises. It currently provides power to 3,000 people.

In Senegal, EDF has a 70% holding in the company ERA, alongside its partner Matforce. ERA operates the rural electrification concession of Kaffrine Tambacounda Kedougou, which began operation in late 2012 (objective: 180,000 people within three to four years).

## 6.4 Other activities and cross-divisional functions

### 6.4.1 Other activities

The table below lists the EDF Group's installed capacity and outputs in the Other activities segment at 31 December 2012<sup>1</sup>:

	Installed capacity		Generation	
	MW	%	GWh	%
Thermal	2,398	36	4,396	33
Hydropower	81	1	78	1
Other renewables <sup>(1)</sup>	4,190	63	8,656	66
<b>TOTAL</b>	<b>6,668</b>	<b>100</b>	<b>13,130</b>	<b>100</b>

(1) Including the entire EDF Énergies Nouvelles group.

#### 6.4.1.1 EDF Trading

EDF Trading is the interface between the EDF Group and the energy wholesale markets providing optimization and risk management services. The company is present on the European and North American electricity markets, the markets for natural gas (including LNG), coal and freight, oil logistics and environmental products. In 2012, EDF Trading reinforced its asset-backed business model through the acquisition of long term asset positions in order to secure sustainable revenue streams. In 2012, EDF Trading traded around 3,130TWh of electricity (Europe and the US), 445 billion therms of natural gas, 706 million tonnes of coal and 381 million tonnes of CO<sub>2</sub> (in emission certificates).

The trading activities of EDF Trading are integrated into DOAAT's optimisation strategy.

EDF Trading has offices in Europe, Asia and North America. Its registered office is in London. The company has a staff of around 1,000 employees.

A wholly-owned subsidiary of EDF, it is governed by the British financial market regulator, the Financial Services Authority.

##### 6.4.1.1.1 Electricity trading

EDF Trading is a leader in the European and North American electricity wholesale market.

In Europe, EDF Trading manages EDF's long-term electricity export contracts and has a major role in managing supply and hedging the production and sales portfolio of EDF in Europe. EDF Trading has a considerable portfolio of assets and, in addition, provides risk management services including short-term and long-term balancing and structured hedging instruments, to a diversified customer base.

In 2012, EDF Trading moved its Nordic positions to London in order to consolidate its trading activities. It also executed a greater number of long

term transactions out to 2025, began a new short term power optimization process for EDF Luminus and EDF Energy and extended its third party business.

In North America, EDF Trading is one of the main providers of energy management services for energy generation companies in the US. Its services include scheduling, fuel supply, market analysis, hedge execution, dispatching and management of fuel. The company is present in North America's largest electricity hubs. EDF Trading is also responsible for optimising a portion of EDF's nuclear generation in the US (see section 6.3.3.2.2.2 ("EDF Trading in North America")).

##### 6.4.1.1.2 Environmental products

EDF Trading is active across the carbon, biomass, biofuel and weather derivatives markets which constitute its environmental products offer.

EDF Trading holds a pivotal position in the carbon emissions market. The company manages EDF's carbon fund: €192 million committed for the purchase of carbon emission reduction (CER) credits (i.e. 66% of the maximum initial commitment of €290 million). This fund is managed by EDF with the purpose of diversifying its sources of emissions quotas and, thereby, honouring its environmental commitments. EDF Trading is actively involved in trading emissions quotas in Europe and carbon emission reduction (CER) credits, CER production and the clean development mechanism (CDM) on a global scale.

The company is also involved in the trading of renewable energy certificates (RECs) and biogas in the US and is one of the largest biomass suppliers in the UK and Poland. As well as being a leader in the European weather derivatives market, EDF Trading is the largest importer and trader of green energy in the UK and Italy.

In 2012, EDF Trading acquired production plants for biomass and biodiesel in order to build a foundation for EDF Trading to develop these two businesses. In carbon, it now manages a portfolio of over 400 CDM projects across the world and is the largest project developer in China. It began trading and

1. The figures shown reflect the consolidation method used for the entities.

exchanging contracts in preparation for California's carbon trading scheme which becomes effective in early 2013 and transacted its first deal with EDF Renewable Energy (ex enXco). In weather derivatives, it expanded the suite of products it offers to its customers.

### 6.4.1.1.3 Gas trading

Present throughout the world, EDF Trading is a leading player on the global gas and LNG wholesale markets. It has its own portfolio of gas assets including production, transmission, transportation, re-gasification, long-term supply and storage. This enables it to support the EDF group and third party customers with complete gas wholesale market solutions.

In 2012, it began the optimisation of EDF's European gas portfolio including storage and transportation. The growth of this business will go hand in hand with commissioning of new EDF's gas plants in 2013. To do this, it began managing two of the Group's gas storage assets. In the US, it acquired upstream gas production assets in the East Texas Basin to build a solid platform from which to develop its North American gas positions. It also expanded its commercial and industrial activities to the North American gas market.

### 6.4.1.1.4 Coal and freight trading

EDF Trading is a leader in the global coal and freight markets. The company is one of the largest importers of coal in Europe. Its assets include long-term contracts, coal terminals, a modern fleet of bulk carriers, port and rail capacities, and long-term export capacity. EDF Trading is EDF's sole supplier of coal in France and it has executed supply agreements with EDF Energy, EDF Polska and other European energy companies. EDF Trading has a fully integrated freight and coal business, with numerous supply sources across the globe, including South Africa, Asia, the US and eastern Europe. The company sources, stores, mixes, delivers and trades coal and provides complete management of the supply chain, from the port of loading to the power plant.

In 2012, it completed an investment in Poland to develop a new coal terminal which will secure a long term supply contract and it established a coal and biomass business for the Polish market through a joint venture with EDF Paliwa (see section 6.3.3.1.1.1 ("Poland")) It is also finalizing its first terminal deal in China and is expanding its supply business across Europe.

### 6.4.1.1.5 Oil freight

In 2012, EDF Trading created a new business line to complete its product offering across North America. Its new crude oil logistics business has begun transacting business in four of the most active crude oil producing states in the US – Texas, Louisiana, Oklahoma and North Dakota. In December, it commenced transporting and purchasing crude oil via both truck and pipeline. This is an activity it plans to develop during 2013.

## 6.4.1.2 New energies

Renewable energies<sup>1</sup>, including new branches (wind, solar, biomass, geothermal, marine energy, etc.) have undergone tremendous growth, mainly in Asia (China), Europe and the US.

The combined installed wind capacity worldwide reached 281GW at the end of 2012, around 60GW of which was in the US and around 109GW in Europe. Over the course of 2012, 44GW of wind capacity was built worldwide, 13GW of which was in China and 13GW in the US<sup>2</sup>.

As regards solar photovoltaic power, total global capacity was 100GW at the end of 2012, of which 30GW was from new capacity built in 2012<sup>3</sup>.

Today, it is mainly wind, biomass and solar that drive growth in renewable energies. Hydropower generation is, in fact, close to its maximum output potential in a lot of developed countries, even if it retains significant development potential in other regions of the globe (of the 97GW of new renewable capacity development expected each year in the world, around 26GW is hydropower capacity<sup>4</sup>).

The EDF Group is among the five global leaders in renewable energies owing to its 27GW of installed renewable energy capacity (mainly hydropower) and it aims to develop all forms of renewable energies, prioritising wind and solar power generation. EDF also intends to prioritise the emergence of new technologies in conjunction with R&D. This process is in line with the Group's sustainable development policy (see section 6.6.2 ("Environmental policy")).

### 6.4.1.2.1 Description of new energies

#### Wind power

The wind turbine operates through the action of the wind, which drives rotor blades attached to an electrical generator. The wind power categories are:

- onshore wind generation. This is a mature sector, which now is close to competing with traditional sectors. It benefits from economic incentives in most countries (see section 6.5.3 ("Legislative and regulatory environment")). For 1MW of installed capacity, average annual electricity generation can vary from 2 to 4GWh, depending on the quality of the site and the type of machines used. Generally, each wind turbine delivers power of 2 to 3MW.

In 2012, France was ranked fourth in Europe in terms of installed capacity (behind Germany, Spain and Italy).

EDF Énergies Nouvelles is the vector through which the EDF Group develops this energy; it draws on its own engineering and R&D for its expertise and technical monitoring, as well as on EDF's engineering and R&D departments.

The subsidiaries EDF Energy, EDF Luminus and Edison also have wind farms in operation and projects in development. The EDF Group's production of wind-based electricity was 8.5TWh in 2012;

- offshore wind generation. Considered as a sector in full development, offshore wind power is more expensive in terms of investment and the cost of network connection; it involves more difficult operation/maintenance at sea, in which area operators have less expertise. However, the capacity of wind generating units (3 to 6MW) is higher and production is greater because of more regular winds (1MW installed capacity gives output of between 3 and 4GWh). The sector is on a learning curve that will enable it to reduce the cost differential with onshore wind generation. The EDF Group has decided to gradually increase its investment in offshore wind generation. The outlook for growth in offshore wind generation is considerable. Europe intends to build nearly 44GW<sup>5</sup> of offshore wind generation by 2020, of which nearly 13GW in the UK and 6GW in France. To reach this target, the French government launched its first call for tenders in January 2011, which aims to commission 3GW of offshore wind capacity by 2020. The consortium led by EDF Énergies Nouvelles won three out of the four sites allocated, i.e. up to 1,500MW. A second call for tenders has been launched (see section 6.4.1.2.2 ("EDF Énergies Nouvelles")).

1. Renewable, or "green" energies, are derived from natural resources that are replenished quickly enough to be considered inexhaustible in human terms.

2. Source: EurObsv'ER 2013, Wind Barometer.

3. Source: EPIA (European Photovoltaic Industry Association), Market Report 2012.

4. Source: International Energy Agency, World Energy Outlook 2012, New Policies Scenario.

5. Source: European Environment Agency, Renewable Energy Productions as published in the National Renewable Energy Action Plans of the European Member States, February 2011.

### Solar photovoltaic power

In 2011 and 2012, the solar photovoltaic power market grew sharply in France, with connected capacity rising from 1,168MW on 31 December 2010 to 3,923 on 30 September 2012, i.e. a three-fold increase in the space of 21 months.

EDF Énergies Nouvelles is the entity implementing the EDF Group's development strategy in solar energy. At 31 December 2012, the subsidiary had 573.8MWc net capacity in service or under construction.

One of the major challenges in solar power research is the development of innovative technology to greatly reduce the cost of generation. EDF R&D therefore conducts research on photovoltaic technology at its Chatou site, as part of the French Institute for Photovoltaic Power Research and Development (IRDEP), established in partnership with CNRS and ENSCP (the National Graduate School of Chemistry in Paris). EDF Énergies Nouvelles also pursues this goal through its shareholdings in PV Alliance and Nexcis.

### Biomass

Technologies based on biomass mainly consist of burning certain waste, in particular from the timber and farming industries, or of exploiting dedicated forests, to produce heat or electricity.

Through its holdings, notably in Dalkia, the EDF Group owns shares in France and abroad in several dozen heating systems and small size generating facilities which are mainly fuelled with wood. EDF also has a controlling interest in the company Tiru, which uses biomass in the form of household and green waste. Its plants have a total installed capacity of 70MW.

In Poland, EDF operates several co-combustion facilities (incorporating biomass in fossil fuels) for a total capacity of 108MW.

Lastly, EDF Énergies Nouvelles owns, through its wholly owned subsidiary SIIF Énergies Iberica, a 26MW gross plant in Lucena (Andalucía), which uses the waste from the production of olive oil.

### Geothermal energy

The temperature of the rocks in the earth's crust increases with depth: on average, 3 degrees Celsius every 100 meters. In some regions, geothermal energy reaches the surface in the form of hot springs, water or steam. Hot water is used directly as heat: central heating in dwellings or greenhouse heating.

Steam extracted from beneath the ground is also used to generate electricity: it drives a turbine, as it does in a traditional thermal power plant. It is also possible to use hot and dry rocks to produce steam and in turn electricity. To develop this activity, EDF has several partners (including Électricité de Strasbourg, EnBW and German energy companies) as part of a European grouping that develops and operates a prototype geothermal electricity generation unit in hot, naturally broken crystal rocks in Soultz in Alsace.

France also has high-temperature resources located in its overseas departments. The EDF Group is present in this segment, particularly through its non-controlling interest in Geothermie Bouillante in Guadeloupe.

### Other technologies

Renewable energies cover a wide range of sectors and technologies. To prepare for the future, EDF Énergies Nouvelles is responsible within the EDF Group for determining promising sectors and, with the support of the Group's R&D teams or industrial partners, contributes to the creation of new technologies. Along with solar power (see above), marine energy is an area the Group is exploring in depth. It covers a wide range of technologies whose technical validity and efficiency must be assessed before they can be developed on an industrial scale, in the same way as wind and solar power.

EDF Group's commitment to developing marine energy is visible through three projects under development:

- tidal current turbines: underwater turbines harnessing the energy of marine currents. EDF has built a prototype tidal current turbine on the Paimpol-Bréhat site in the Côtes-d'Armor department. It was launched during the summer of 2012 and will soon enter a second test phase, generating its first electricity. The goal of the project, which will ultimately include four turbines with a total capacity of 2MW, is to test the feasibility of producing energy from tidal currents in real conditions. Taking this experiment further, EDF Énergies Nouvelles, in partnership with DNCs, Europe's leading manufacturer of naval vessels, is examining the industrial applications needed to produce electricity from tidal current turbines and is working on the "Normandie Hydro" project, a tidal energy farm producing more energy in the Raz Blanchard off the Cotentin coast;
- wave energy: EDF Énergies Nouvelles, again in partnership with DCNS, is developing a prototype to convert wave energy, which is currently being launched off Reunion Island. This pilot project has been named "Houle australe" (Southern Swell);
- floating offshore wind turbines: EDF Énergies Nouvelles has selected VertiWind technology and has partnered with industrial player Technip, which is leading the project and is responsible for the "floating" aspect, and with Lille-based start-up Nénuphar, for the manufacturing of the turbine. The project has been selected by the European Commission and will receive a substantial subsidy.

#### 6.4.1.2.2 EDF Énergies Nouvelles

The EDF Group's involvement in renewable energies is undertaken mainly by EDF Énergies Nouvelles.

#### EDF Énergies Nouvelles shareholding

EDF acquired an initial stake in EDF Énergies Nouvelles in 2000 and, as of the filing date of this reference document, directly and indirectly owns 99.9% of the company's capital (the remaining 0.1% is owned by its employees).

Since that time, EDF Énergies Nouvelles has undergone profound changes, becoming in just a few years a key player in renewable energy electricity generation and a leading operator in its major regions of operation: North America and Western Europe.

EDF Énergies Nouvelles has thus become the EDF Group's centre of expertise and development in the fields of wind and photovoltaic energy. The financial results of subsidiaries dedicated to renewable energy are incorporated into those of EDF Énergies Nouvelles.

#### EDF Énergies Nouvelles activities

EDF Énergies Nouvelles generates electricity from renewable energy sources and is involved in every stage of the generation process. EDF EN thus operates upstream in project development, in the construction of power plants and finally in their operation and maintenance. Each of these activities may be conducted on its own account or on behalf of third parties. As part of its project development activities, the Group also undertakes the Development and Sale of Structured Assets (an activity referred to as "DVAS"), which mainly consists of developing projects on behalf of third parties in the field of renewable energies.

Whilst its development focuses on wind and solar photovoltaic energy (which account for 95% of its installed capacities), the Group is also active in other renewable energy sectors: small-scale hydropower, biogas, biomass, biofuels and marine energy (194.3MW gross at the end of 2012). EDF EN is also present in the decentralised renewable energy sector (decentralised solar power).



# 6 | Overview of activities

## Other activities and cross-divisional functions

Historically, EDF EN has expanded in two geographical regions: Western Europe (particularly France, the UK and Italy) and the United States, recently expanded to cover North America with Canada and Mexico. 2012 saw the Group enter new countries with high growth potential for renewable energies, such as South Africa, Morocco, Israel and Poland.

At 31 December 2012, EDF EN had a gross installed capacity of 5,372MW, a net installed capacity of 4,208MW and 1,329MW under construction.

The following table sets out the capacities by segment and by country:

Installed capacity (in megawatts)	At 31 December 2012		At 31 December 2011	
	Gross <sup>(1)</sup>	Net <sup>(2)</sup>	Gross <sup>(1)</sup>	Net <sup>(2)</sup>
<b>Wind</b>				
US	1,805.8	1,642.1	1,276.9	1,193.9
France	383.3	376.7	389.1	365.4
Italy	525.0	342.9	487.0	304.9
Portugal	495.8	302.9	495.8	302.9
Greece	316.5	289.2	314.7	288.3
Canada	218.0	218.0		
UK <sup>(3)</sup>	269.7	184.5	233.7	166.5
Turkey	311.2	112.8	219.2	89.8
Mexico	89.5	89.5	67.5	67.5
Poland	48.0	48.0		
Belgium <sup>(4)</sup>	214.5	19.6	30.0	2.7
Germany	3.0	3.0	7.6	7.6
<b>Total wind power</b>	<b>4,680.3</b>	<b>3,629.2</b>	<b>3,521.5</b>	<b>2,789.5</b>
<b>Solar</b>				
France	218.1	190.2	100.7	100.3
Italy	122.8	102.1	122.2	92.2
Spain	50.3	37.9	46.0	32.3
US	4.9	4.9	10.5	10.5
Greece	11.6	11.6	6.0	6.0
Canada	23.4	23.4	70.5	70.5
RES	66.1	39.4	57.7	28.9
<b>Total solar</b>	<b>497.3</b>	<b>409.6</b>	<b>413.5</b>	<b>340.6</b>
<b>Other segments</b>				
Hydropower	84.2	81.4	84.2	77.1
Biogas	64.9	63	60.3	59.5
Biomass/Cogeneration	45.2	24.9	45.2	24.9
<b>Total other segments</b>	<b>194.3</b>	<b>169.3</b>	<b>189.7</b>	<b>161.5</b>
<b>TOTAL</b>	<b>5,371.9</b>	<b>4,208.1</b>	<b>4,124.7</b>	<b>3,291.6</b>

(1) Gross capacity: total capacity of the facilities in which EDF Énergies Nouvelles has a stake.

(2) Net capacity: capacity corresponding to EDF Énergies Nouvelles' stake.

(3) EDF Énergies Nouvelles owns 50% of EDF Energy Renewables (the other 50% is owned by EDF Energy). Consequently, the net capacity shown of 184.5MW includes only 50% of the 134.5MW wind capacity of EDF Energy Renewables.

(4) MW in wind off-shore exclusively.

At 31 December 2012, EDF Énergies Nouvelles employed 2,749 people (including EDF Énergies Nouvelles Réparties).

### Developments in wind power

#### Onshore wind power

EDF Énergies Nouvelles actively pursued growth in onshore wind energy in 2012, increasing its wind generation capacity by 974.3MW gross, bringing its total operating capacity to 4,465.5MW gross at 31 December 2012.

Commissioning of on-shore wind farms has reached in 2012 a record figure of 1,321.8MW gross (including wind farms developed for third parties).

EDF EN commissioned three wind farms in Quebec, Canada: Saint-Robert Bellarmin (80MW), Massif du Sud (150MW) and Lac Alfred 1 (150MW). These wind farms, giving a total capacity of 380MW, represent three of the seven wind power projects that make up the 1,003MW programme won through the call for tenders issued by Hydro-Québec.

The wind power market was particularly buoyant in the US in 2012 and EDF Énergies Nouvelles commissioned a record number of new wind farms. Five major wind farms with a total capacity of 654.3MW entered service: Spearville 3 (100.8MW) in Kansas, Shiloh IV (102.5MW) and Pacific Wind (140MW) in California and Spinning Spur I (161MW) and Bobcat Bluff (150MW) in Texas.

In Europe, EDF EN commissioned the wind farms of Green Rigg in the UK (36MW), Rignano Garganico in Italy (38MW) and Linowo in Poland (48MW), along with other farms in Turkey, France and Germany, giving a total of 277.5MW.

A number of construction projects began in 2012, in countries including Turkey, Greece, Canada and Mexico. In total, wind farms under construction represented 940.7MW at 31 December 2012.

## Offshore wind power

Offshore wind power will be a key vector of growth in the coming years, particularly in Western Europe.

In France, in April 2012, the consortium led by EDF Énergies Nouvelles won three out of the four sites allocated further to the first call for tenders issued by the French government in 2011. These three projects (Saint-Nazaire, Courseulles-sur-Mer and Fécamp) represent new capacity of up to 1,500MW and are accompanied by an ambitious industrial plan including the construction of four wind turbine manufacturing plants. The consortium, launched by EDF Énergies Nouvelles, includes the Danish energy company Dong Energy – builder and operator of the world's largest offshore wind farm – and Alstom, which will be the exclusive supplier of 6MW wind turbines for France's future offshore wind farms.

EDF Énergies Nouvelles intends to respond to the second call for tenders issued by the government concerning two sites with approximate capacity of 1,000MW.

In Belgium, EDF Énergies Nouvelles has a 9.14% interest in C-Power's Thornton Bank wind farm through its subsidiary EDF EN Belgium. Its first unit (30MW) is in operation, while the second unit (147.6MW) and part of the third (36.9MW) were commissioned in late 2012, giving a total of 214.5MW in operation. Units with total capacity of 110.7MW are under construction.

In the UK, the 62MW-capacity Teeside offshore wind farm, wholly owned by EDF Energy Renewable – a subsidiary owned 50/50 by EDF Energy and EDF Énergies Nouvelles – is under construction.

## Development of the solar photovoltaic industry

EDF Énergies Nouvelles pursued growth in solar photovoltaics, its second area of growth. At 31 December 2012, the installed solar capacity was 497.3MW gross. 2012 was marked by the commissioning of three major power plants in France: Crucey (60MW), Massangis (56MW) and Toul-Rosières (115MW). The latter project, equipped with around 1.4 million solar panels, involved the clean-up and conversion of a former military base. These plants are operated and maintained by EDF Énergies Nouvelles. The new plants commissioned in 2012 came to a record total of 296.7MW gross.

In the US, the 12-MW Lipa plant was commissioned and sold.

At 31 December 2012, EDF EN held a portfolio of solar projects under construction of 170.4MW gross.

As part of the Group's DSSA activity, 239.7MW of solar photovoltaic power was sold, mainly in France, the US and Canada.

## Sites in new countries

EDF EN expanded its operations abroad by opening a wholly owned subsidiary in Poland, EDF EN Polska. The creation of this subsidiary follows

the acquisition in Poland of the wind power development company Starke Wind and a 48MW operational wind project. These two purchases were concluded in an economic and regulatory environment in Poland that favours the development of renewable energies in Poland.

In South Africa, EDF EN also entered the wind power market when it was selected by the South African energy department for three wind power projects allocated as part of the second round of renewable energy tenders in South Africa, which was launched in August 2011. These three projects, on which construction should begin in 2013, represent total power of 104MW.

In Morocco, the consortium led by EDF EN in partnership with the Japanese Group Mitsui & Co was selected through a call for tenders issued by Morocco's ONE (National Electricity Office) for the 150MW Taza wind power project. Located in the north of Morocco, this project will be equipped with 50 Alstom turbines, each with a unit capacity of 3MW. EDF Énergies Nouvelles also opened a local subsidiary, EDF EN Maroc, which will now lead the development of its activities in Morocco.

EDF EN began operating in Israel through its subsidiary EDF EN Israel, which tied up a strategic partnership with Arava Power, an Israeli solar power pioneer. After the acquisition in 2011 of five development projects for a total of 39.3MW, in January 2012 the subsidiary won a call for tenders for 7MW issued by the ILA (Israel Land Administration). A total capacity of 70MW is scheduled for construction as of the end of 2012, with almost 120MW earmarked for development in this booming nation.

## Ramp-up of the Operation and Maintenance activity

As an integrated operator, EDF Énergies Nouvelles operates and maintains its own facilities. This activity has grown significantly and is also carried out on behalf of third parties. Worldwide, the EDF EN Group operated around 8,000MW as of the end of December 2012.

This makes EDF EN the leading operation-maintenance company in the US through its subsidiary EDF Renewable Energy (formerly EnXco).

The Group also announced in January 2013 that, subject to the approval of the relevant regulatory authorities, it will operate and maintain 32 wind farms in France with a total capacity of 321.4MW, purchased from Hyberdrola by a consortium made up of EDF EN (20%), GE Energy Financial Services (40%) and MEAG, an asset management subsidiary of Munich Re and ERGO (also 40%).

## Decentralised Energy

EDF Énergies Nouvelles Reparties, wholly owned by EDF Énergies Nouvelles since 30 June 2012, continued to refocus its activities on solar photovoltaic power:

- February 2012: sale of its stake in Supra Holding;
- March 2012: takeover of assets from Photowatt International, in accordance with the decision of the Vienna Commercial Court of 21 February 2012, by EDF ENR PWT;
- July 2012: sale of its stake in Apollon Solar;
- October 2012: sale of its stake in EDF ENR Solare (Italy).

Today, with more than 10,000 domestic customers and more than 500 projects delivered to business customers and local authorities, EDF ENR is the leader in solar photovoltaic roof panels in France. Business is driven by its marketing and installation subsidiaries EDF ENR Solaire in mainland France and Sunzil in France's overseas departments, as well as EDF ENR PWT for photovoltaic cell production.

EDF ENR also pursues an innovation policy for photovoltaic power, mainly via its shareholding in Nexcis.

# 6 | Overview of activities

## Other activities and cross-divisional functions

### Support schemes and price setting for wind and solar power electricity

The table below summarises the various support schemes for wind and solar power in force at the time of filing this reference document, by major country where EDF Énergies Nouvelles and its subsidiaries are present as of 31 December 2012:

Country	Support schemes for renewable energy (wind and solar)
Canada	Tax incentive programme (FTS) for investors in energy utilities. Prices fixed through long-term purchase contracts with local service providers or through calls for tender. Purchase obligation in Ontario (20-year contracts for wind and solar farms).
United States	Tax credit ("Production Tax Credit" for wind farms and "Investment Tax Credit" for both solar and wind farms). Accelerated depreciation. Compulsory renewable energy quotas ("Renewable Portfolio Standards") set in 29 states and the District of Columbia.
France	Purchase obligation (non-renewable 15-year wind contracts and 20-year solar contracts with EDF or a non-nationalised distributor at regulated prices). Calls for tender. Tax incentives greatly reduced since the 2011 moratorium.
Italy	Green certificates (issued during the first 15 years of operation of the facility) for wind power until 2012. Purchase obligation programme awarded at auctions from 2013. Generation subsidies for solar photovoltaic plants. New tariff structures since 2012.
United Kingdom	Obligation certificates ("Renewables Obligations Certificates"). Exemption from climate change levy.

The table below summarises the various pricing schemes for wind power electricity in force at the time of filing this reference document, by major country where the Group is present as of 31 December 2012:

Country	Pricing schemes for wind power electricity
Canada	Prices set under "Power Purchase Agreements" (PPA) negotiated with local power utilities or via calls for tender Feed-in tariff set for 20 years in Ontario.
United States	Prices set under "Power Purchase Agreements" (PPA) negotiated with local power utilities.
France	Onshore wind: tariffs in force in mainland France and Corsica for land-based facilities commissioned after 26 July 2006: 8.2 euro cents/kWh for the first ten years. For the next five years, tariffs between 8.2 euro cents and 2.8 euro cents/kWh, depending on the number of equivalent full power hours observed during the first ten years of operation. For the overseas departments, Saint-Pierre-et-Miquelon and Mayotte a single tariff of 11 euro cents/kWh applies. These rates are reassessed on an annual basis and are partially indexed to inflation. Offshore wind: tendering systema.
Italy	For wind farms commissioned through end-2012: - until 2015, a system of green certificates issued for the first 15 years of operation of a facility and sold on the market, through bilateral contracts to GSE (Gestore dei Servizi Elettrici) at the end of their term: sale of electricity to the network operator or an electricity distributor, as applicable; price of green certificates: (€180/MWh, the electricity price) × 78%; - from 2016, feed-in tariff calculated on the same basis.
Mexico	For wind farms commissioned from 2013, auction-based feed-in tariffs.
United Kingdom	Prices set under Self Supply Agreements ("SSA") negotiated with end-customers.
	Quota system for the contribution of renewable energy sources to the electricity supplied by utilities. The suppliers obtain "Renewables Obligation Certificates" (ROCs) by generating themselves electricity from renewable sources or by acquiring it from renewable energy producers. Non-compliance with the renewable energy quota results in a penalty ("buy out price"), which is then paid to energy suppliers in proportion to their renewable energy output (via a "buy out fund") and represents additional remuneration. Exemption from climate change levy: The price paid to producers of renewable energy under power purchase agreements is usually calculated based on the market price of electricity, the "buy out price", the "buy out fund", and the climate change levy ("Levy Exemption Certificate"). In September 2012, this price was £90/MWh for onshore wind and £135/MWh for offshore wind (market price + ROC). From 2017, the ROC system will no longer apply to newly-commissioned plants. Low-carbon technologies will benefit from "Contracts for Difference" guaranteeing a fixed price for generated electricity (strike price), depending on generation technology and costs.

The table below summarises the various pricing schemes for solar power electricity in force at the time of filing this reference document, by major country where the Group is present as of 31 December 2012:

Country	Pricing schemes for solar power electricity
Canada (Ontario)	In September 2012: Ground-based farms: CAD\$347/MWh for output of 5 to 10MW (no indexing) Rooftop solar: CAD\$539/MWh for outputs less than 10kW to 50kW and CAD\$487/MWh for projects greater than 500kW (no indexing) Significant declines in tariffs are expected with the next contracts attributions
United States	Prices set under "Power Purchase Agreements" (PPA) negotiated with local power utilities Feed-in tariffs set by some states (including California) for smaller fleets and limited volumes "Investment Tax Credit" (ITC) renewed until December 2016
France	Significant changes since 2011: Calls for tender for ground-based and building-integrated PVs with outputs exceeding 100 kWc For projects with outputs lower than 100 kWc, quarterly tariff adjustment based on the number of projects completed in the previous quarter, with an annual target of 500MWc
Italy	New tariff structures released in 2012: Declining tariffs depending on the size of the facility and the passage of time (semester-based drop) Tariffs in force in September 2012: Rooftop solar: from €135 to €237/MWh Ground-based solar: from €128 to €229/MWh

### 6.4.1.3 Dalkia

Dalkia, a leading European energy services provider, generated revenue of €7,767 million in 2012 over its scope of consolidation, comprising Dalkia France (99.93%), Dalkia International (75.81%) and Dalkia Investissement (50%). Dalkia offers a full range of services with excellent coverage throughout France, as well as substantial operations across Europe.

#### Dalkia's businesses

Dalkia's business is based on optimised energy management. Dalkia has gradually built up a variety of energy management services in areas such as heating and cooling systems, thermal and multi-technology applications, industrial utilities, installation and maintenance of generating equipment, integrated facilities management services, and electrical services for public places. Dalkia also promotes renewable and alternative energies, including cogeneration, biomass, geothermal power, household waste incineration, and heat recovery systems from manufacturing processes.

#### EDF's stake in Dalkia's holding company

On 31 December 2012, EDF owned 34% of the shares and voting rights of Dalkia's holding company, which is a French simplified limited company. Dalkia's remaining share capital is held at 66% by Veolia Environnement, a company whose shares are listed for trading on NYSE Euronext in Paris and New York. EDF also held directly approximately 24 % of Dalkia International's share capital and 50 % of Dalkia Investissement's share capital as of 31 December 2012.

Moreover, EDF held 4 % of Veolia Environnement at 31 December 2012.

#### Partnership agreements with Veolia Environnement

Relations between EDF and Veolia Environnement in the Dalkia Group are governed by a set of contracts concluded on 4 December 2000 to develop a common worldwide energy services activity. Under these agreements, EDF acquired interests, as described above, in the Dalkia Group companies and brought some of its subsidiaries in energy services to Dalkia as in-kind contributions.

The partnership is based on the principle of parity in the control and management of both partners in all Dalkia Group companies with a progressive increase of EDF's stake in Dalkia share capital from 34% to 50% of the share capital.

The shareholders' agreement between EDF and Veolia Environnement also includes a change of control provision under which each partner has the right to repurchase to the other its entire stake in Dalkia, if it were to get controlled by a third party competitor. Finally, it gives each party of pre-emption right in the event of sale of Dalkia shares to a third party purchaser.

#### Evolution of the partnership

EDF and Veolia had announced in December 2011 that negotiations were ongoing on the evolution of their industrial partnership and towards EDF parity. These negotiations have failed. Given the repeated failure of the discussions between EDF and Veolia Environnement to implement this parity for several years, EDF went to courts on 22 October 2012 to obtain the enforcement of the agreements concluded in 2000 and the parity in the Dalkia Group as provided for these agreements.

### 6.4.1.4 Électricité de Strasbourg

Électricité de Strasbourg is a French public limited company (*société anonyme*); EDF owns 88.6% of its shares, which are traded on NYSE and Euronext Paris. The remaining Électricité de Strasbourg shares are held by the public and employees.

Électricité de Strasbourg distributes electricity to 409 municipalities in the Bas-Rhin region and has 377 concession contracts that were renewed between 1993 and 1999 for a 40-year term; it serves approximately 80% of the population of the Bas-Rhin department. Due to its electricity distribution business, Électricité de Strasbourg is subject to legal and operating restrictions related to the opening up of the markets.

As required by the law, in January 2009 Électricité de Strasbourg spun off its marketing activity as a subsidiary by creating the company, ES Énergies Strasbourg.

ES Énergies Strasbourg sells electricity to approximately 475,000 customers. The company sold 5TWh of electricity and 0.3TWh of gas in 2012.

On 1 April 2012, the ES Group has acquired 100% of the shares and voting rights of Enerest from RGDS (Réseau Gaz Distribution Services). Enerest is the longstanding gas supplier to the economic region of Strasbourg, which has around 110,000 customers and sold 5.2TWh in 2012. This transaction



made the ES group the leading regional multi-energy provider and it has undertaken an ambitious programme to facilitate the consolidation of Énerest, expand its growth prospects beyond its historical scope and develop operating synergies.

Électricité de Strasbourg has also launched a project to revamp its IT system in order to allow it to manage and invoice corporate customers, meeting the needs of the distributor ES Réseaux and the marketer ES Énergies Strasbourg.

The deep geothermal project (see section 6.4.1.2.1 ("Description of new energies")) led by ECOGI, of which Électricité de Strasbourg is the major shareholder along with the industrial company Roquette Frères and the Caisse des Dépôts et Consignations, began with an initial drilling operation which was completed in December 2012.

In November 2012, Ecotral, Électricité de Strasbourg's subsidiary specialising in renewable energy and energy eco-efficiency for businesses and local authorities, purchased the non-controlling shares of Calorest, in which it already held a stake of 62.575%. Ecotral now owns all of the shares of this company, which specialises in the maintenance of heating, air-conditioning and ventilation systems.

After the commissioning in July 2012 of a large investment property complying with Very High Energy Performance standards, the Group entrusted Ecotral with designing and carrying out renovation work in accordance with the BBC label ("*Bâtiment Basse Consommation*", or low-energy building) on a second investment property in the centre of Strasbourg.

## 6.4.1.5 Tiru

Tiru, an operator of waste treatment units since 1922 and a 51%-owned subsidiary of the EDF Group since 1946, specialises in energy recovery from waste in the form of electricity and steam.

Tiru designs, builds and operates thermal, biological and material treatment units. A key player in its sector, Tiru operates diverse facilities in France, the UK and Canada.

Every year, Tiru recovers 4 million tonnes of waste for more than 11 millions of residents worldwide, which ensures heating<sup>1</sup> for 465,000 residents and electricity (excluding heating) for 590,000. Half of this energy comes from renewable sources.

Thanks to its waste recovery, Tiru ensures that 2.4 million barrels of oil<sup>2</sup> per year are saved, preventing 700,000 tonnes of CO<sub>2</sub> emissions.

## 6.4.1.6 EDF Trading Logistics

With a fuel oil supply volume of 1.122 million tonnes and 4,957 million tonnes of coal delivered in 2012, EDF Trading Logistics is EDF's agent for fuel oil purchases and organises fuel oil and coal supply logistics operations for all of EDF's fossil-fuel fired plants in mainland France, Corsica and France's overseas departments. EDF Trading Logistics also acts as a coal freight forwarder for several large industrial companies (cement manufacturers, heating specialists, etc.) in close cooperation with EDF Trading and the operators of the coal terminals at the ports of Le Havre and Saint Nazaire.

Furthermore, EDF Trading Logistics provides EDF with its expertise in the implementation of processes for managing risks relating to the transport of fuel oil (hazardous materials), an activity that has been awarded ISO 14001 certification, and in the management of environmental crises arising from this activity.

## 6.4.1.7 Other equity interests

In addition to interests in Local Distribution Companies or LDCs (SMEG, Enercal, Électricité de Mayotte, and EDSB), the EDF group has subsidiaries and interests in industrial companies. These companies contribute to the Group's objectives in their respective business sectors (generation, fuel and engineering) and more particularly to those of the Production and Engineering Division – to ensure the short and medium term performance of EDF's French portfolio of production assets.

These companies include Cofiva, a holding company of the EDF Group specialised in engineering; SAE, which specialises in fuel transport and trading operations on behalf of the EDF Group; SHEMA, which specialises in hydroelectric power generation by small power plants; and SOCODEI, a wholly owned subsidiary of EDF specialised in the treatment of low- and intermediate-level radioactive waste. SOCODEI owns two machines that are taken to the different nuclear power plants to treat the primary circuit's resins. SOCODEI treats metallic waste by fusion and solid or liquid waste by incineration in its Centrac plant in Marcoule in the Gard region.

## 6.4.2 Gas activities

The EDF Group is present over the entire natural gas chain, mainly through EDF Energy (United Kingdom), Edison (Italy), EDF Luminus (Belgium), and France. The Group also operates through EDF Trading, particularly in the wholesale natural gas market.

### 6.4.2.1 Natural gas end-market

In 2012, the Group's gas sales to end customers amounted to more than 246TWh<sup>3</sup>.

In France, the Group continued a marketing strategy designed to develop the loyalty of the most attractive customers and to grow the value of its customer portfolio, by meeting customer expectations for dual electricity-gas offers, and by capitalising on the Group's experience, particularly on "EDF Bleu Ciel®" brand for the domestic market.

In 2012, EDF's natural gas sales to its end customers in France totalled around 20.9TWh (which represents a market share of 4.3%). As at 31 December 2012 approximately 780,000 customers (ranging from residential customers to key accounts) had chosen EDF as natural gas supplier. In 2011 the figures were respectively 18TWh and 713,000 customers. In 2012, EDF's gas sales business in France was strengthened through the acquisition of Enerest, the main distributor of natural gas in Strasbourg and the Bas-Rhin region, purchased in April 2012 by Électricité de Strasbourg, a wholly owned subsidiary of EDF. Enerest totalled more than 100,000 customers and supplied 5.2TWh of gas.

In Italy, the United Kingdom and Belgium, the development of sales is based on a more aggressive approach with downstream customer portfolios composed of:

- in Italy: around 584,000 customers, 15.8Gm<sup>3</sup> (around 178TWh) or 21% market share;
- in the United Kingdom: around 2 million customers, 31.1TWh;
- in Belgium: around 558.000 customers, 17.2TWh, or around 20% market share.

1. District heating.

2. According to the French Energy Observatory, the energy generated from the combustion of one tonne of oil corresponds to 11,628kWh on average. Moreover, by convention, one barrel of oil corresponds to 0.1364 toe (tonnes of oil equivalent). Thus, for TIRU:

■ toe: 2,900MWh of energy sold / 11.6MWh = 250,000 toe;

■ barrel equivalent: 250,000 toe/0.1364 = 1.8 million barrels of oil.

3. Sales of the EDF companies, EDF Energy, Edison, EDF Luminus, Estag (Austria) at 100%, i.e., not corrected for interest percentage (including non-controlling interests). The gas business of EDF Trading is not taken into account in this figure.

## 6.4.2.2 Gas assets and projects

### 6.4.2.2.1 Supply sources

The Group's gas supply is provided mainly through a diversified portfolio of long-term contracts, coming from Qatar, Russia, the North Sea and North Africa. The Group actively renegotiates its contracts with suppliers to respond to fluctuations in the European gas markets and to restore profitability. In 2012, two decisions were handed down in Edison's favour in the arbitration proceedings between Edison and ENI for Libyan gas and between Edison and RasGas for Qatari gas (see section 6.3.2. ("Italy")).

### 6.4.2.2.2 Infrastructure

#### Gas pipelines

Alongside ENI (20%), Wintershall (15%) and Gazprom (50%), EDF is also a shareholder (15%) of South Stream Transport BV, which is in charge of developing and building the section of the South Stream gas pipeline that passes underneath the Black Sea. Stretching 900km in length and providing 63Bcma in capacity, this offshore section of the gas pipeline is designed to supply the European Union with Russian gas as of the end of 2015. Gazprom made the decision to invest on 14 November 2012. EDF retains a right to withdraw until certain conditions have been met.

The first symbolic weld of the South Stream pipeline was celebrated in Anapa on 7 December, in the presence of the President of the Russian Federation Vladimir Putin and Gazprom's partners in the project.

EDF is also involved in two gas import infrastructure projects through its subsidiary Edison: GALSI, a gas pipeline connecting Algeria and Italy via Sardinia, and the ITGI, a gas pipeline that will serve as an interconnection between Turkey, Greece and Italy. The ITGI project includes a component known as the IGB (Greece-Bulgaria Interconnection) that will link Greece to Bulgaria (see section 6.3.2 ("Italy")).

The Group also holds various transmission capacity rights on the European network.

#### Liquefied natural gas (LNG) regasification terminals

On 29 June 2011, EDF - through its subsidiary Dunkerque LNG (65% owned by EDF, 25% by Fluxys and 10% by Total) - made the final decision to build an LNG terminal with a capacity of 13Bcma on the land owned by the Grand Port Maritime de Dunkerque in France. Henri Proglio, EDF's Chairman and CEO, took part in a ceremony for the laying of the first stone of the project on 5 October 2012. The Dunkirk LNG terminal, which is scheduled to be commissioned at the end 2015, is the second largest industrial construction project in France, behind the Flamanville EPR. The Dunkirk project involves three main components: the platform and maritime work (carried out by the Grand Port Maritime), the LNG terminal, and the work to connect the facility to the French and Belgian networks (developed by GRTgaz and Fluxys). With three LNG storage tanks, each of a capacity of 190,000cm, the terminal will give greater flexibility to the gas network to supply gas-fired power plants and to manage demand peaks during winter. This facility, which is unique

in the fact that it will be connected to two markets, France and Belgium, will be a major step in efforts to secure and diversify European natural gas supplies. In the interest of the environment, EDF opted for a liquefied natural gas heating system that does not generate CO<sub>2</sub> by using a portion of the warm water released by the Gravelines nuclear power plant, putting the terminal on the cutting edge of energy efficiency. The Group holds 8Bcma per year of regasification capacity in the terminal.

In southern Europe, Edison owns 7.3% of the capital of Adriatic LNG Terminal, the company that operates the Rovigo offshore terminal and 80% of the regasification capacity, i.e. 6.4Bcma (see section 6.3.2 ("Italy")).

Lastly, the Group holds regasification capacity in the LNG terminals of Fos Cavaou and Zeebrugge.

#### Storage

In Germany, EDF began commercial operation of the Crystal gas storage facility in Etzel on 28 July 2012. Crystal's aboveground facilities are being developed in a 50/50 joint venture with EnBW. EDF holds approximately 0.19Bcma of volume capacity in this salt cavity storage.

In Italy, Edison operates two storage sites, Cellino and Collalto, in depleted gas reservoirs. Two additional storage projects, San Potito e Cotignola and Palazzo Moroni, are under development (see section 6.3.2 ("Italy")).

In the UK, EDF Energy continues to develop its Cheshire-based Hill Top Farm salt cavity storage site. The site is next to the existing storage site of Hole House, which is owned by EDF Trading (see section 6.3.1 ("United Kingdom")).

In France, EDF pursued the Salins des Landes project, which involved the creation of a dozen cavities in the south of the Landes region in order to store the equivalent of 600 million cm of natural gas. Initial exploratory drilling was carried out in 2010, followed by a second drilling operation in 2012 for a better understanding of the salt dome. All of the information gathered from these drillings showed that, despite its potential, the salt dome would not be compatible with the project initially envisioned by EDF. Furthermore, the technological and economic requirements for a project like Salins des Landes are not met. As a result, on 14 January 2013, EDF decided to discontinue the Salins des Landes project, as it was initially designed. The experience gained and the data collected during the development of this project will be useful to EDF.

EDF also holds storage rights in the Netherlands, Belgium and France.

### 6.4.2.2.3 Exploration and Production ("E&P")

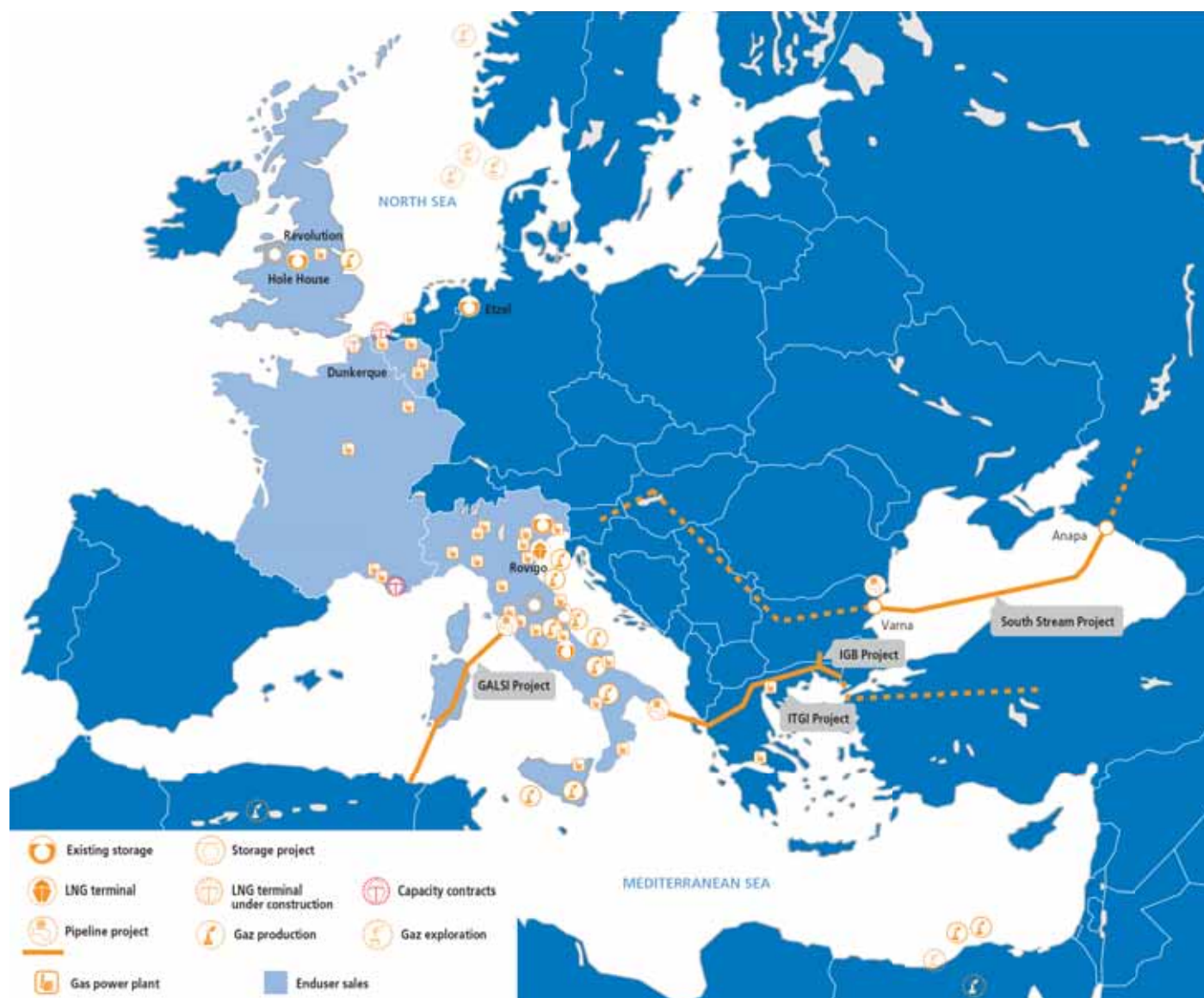
The Group conducts upstream exploration and production ("E&P") activities. Edison's licences, recent discoveries and projects under development are detailed in the "Italy" section (see 6.3.2 ("Italy")).

The Group also owns a subsidiary, EDF Production UK, which produces gas in the North sea. At the end of 2012, its 2P reserves were estimated at 0.8Bcm and its production in 2012 totalled 0.15Bcm.

On 5 November 2012, EDF Trading announced the acquisition of Encana's gas assets, located in the East Texas Basin (see Section 6.4.1.1.3 ("Gas trading")).

## Gas projects and Assets

Map of the gas projects and assets of EDF Group in Europe



## 6.5 Legislative and regulatory environment

EDF group entities are subject to a wide variety of regulations in conducting their business activities. In particular, EDF is subject to European legislation on the electricity and gas markets, which has been transposed into French law, as well as to the applicable environmental, nuclear power and safety regulations.

The following review of legal and regulatory provisions is not designed to be an exhaustive description of all such provisions that are applicable to the EDF group.

### 6.5.1 EDF as a public undertaking

At 31 December 2012, the French State held 84.44% of the share capital and 84.54% of the voting rights of EDF and, pursuant to Article L. 111-67 of the French Energy Code, must at all times hold at least 70% of EDF's capital.

The French Government Shareholding Agency ("APE"), which was founded by Decree no. 2004-963 of 9 September 2004, fulfils the State's remit in its capacity as Company shareholder and, in this respect, proposes and implements the State's decisions and guidelines, in consultation with the ministers concerned.

In accordance with the legislation that applies to all undertakings of which the State is a majority shareholder, EDF may have to undergo certain State audit procedures, in particular through an economic and financial evaluation assignment, pursuant to Decree no. 55-733 of 26 May 1955 on State economic and financial evaluation and Decree no. 53-707 of 9 August 1953 on State evaluation of national public undertakings and certain organisations for which the purpose has an economic or social component.

EDF also has to undergo the audit procedures performed by the French General Accounting Office and Parliament. Thus, in addition to the control performed by the statutory auditors, the Company's accounts and management and, where applicable, those of its directly-held majority subsidiaries, fall under the control of the French General Accounting Office, in accordance with Articles L. 111-4, L. 133-1 and L. 133-2 of the French Code of Financial jurisdiction.

Moreover, the Legislative Decree of 30 October 1935 that organises the State audit of companies, unions and associations or undertakings of all types that have used State financial support, allows the Minister for the Economy to have EDF audited by the General Finance Inspection Office.

The disposal of EDF shares by the State, or the dilution of the State's stake in EDF's capital, is subject to a specific procedure under the applicable regulations, and in particular the so-called privatisation Laws no. 86-793 of 2 July 1986, no. 86-912 of 6 August 1986 and no. 93-923 of 19 July 1993.

### 6.5.2 Public service in France

#### Statutory definition of public service in France

Articles L. 121-1 *et seq.* of the French Energy Code outline the Public Electricity Service (see section 6.5.3.2 ("French legislation: Energy Code") below for a description of this regulation).

#### Public service missions

Article L. 121-1 of the French Energy Code states that the purpose of the Public Electricity Service is, *inter alia*, to guarantee electricity supply throughout French territory, while acting in the general interest, to develop and operate public electricity networks and to supply electricity at regulated sale tariffs.

#### Balanced development of supply mission

The mission to promote the balanced development of electricity supply aims to achieve the objectives defined in the multi-year generation investment plan, which sets targets for allocating generation capacities by primary energy source and, where necessary, by generation technique and geographical area, as well as to guarantee supply to areas of French territory that are not interconnected to the continental metropolitan network.

At present, the multi-year investment plan is defined by an Energy Minister Order of 15 December 2009.

This mission also involves guaranteeing the supply of areas that are not interconnected to Metropolitan France (Corsica, the overseas departments and territories).

As a power producer, EDF, along with the other producers, contributes to the performance of this mission.

#### Mission to develop and operate public transmission and distribution networks

The mission to develop and operate the public electricity transmission and distribution networks involves ensuring rational access to electricity in France through the public transmission and distribution networks, in a way that is environmentally friendly, interconnection with neighbouring countries, as well as connection and access to the public transmission and distribution networks, under non-discriminatory conditions.

The public network operators that are designated by the law are responsible for this mission, namely RTE for transmission, ERDF and the Local Distribution Companies ("LDCs") for distribution, and EDF in the areas not interconnected to the continental metropolitan network.

#### Mission to supply electricity at regulated tariffs

The public service mission to supply electricity involves ensuring the supply of electricity throughout France to customers who benefit from regulated electricity sales tariffs, the supply of electricity to low-income customers who are entitled to the "basic necessity" rate, and the supply of backup power to customers when the balance manager fails.

By law, this mission has been entrusted to EDF and to the LDCs.

The conditions under which customers can benefit from regulated electricity sale tariffs are defined in Articles L. 337-7 *et seq.* of the French Energy Code.



## Social cohesion

Article L. 121-5 of the French Energy Code provides that, as part of its mission to supply electricity at regulated tariffs, EDF must contribute to social cohesion, in particular through the national equalisation of regulated electricity sale tariffs, the implementation of the special “basic necessity” rate and the continued supply of electricity pursuant to Article L. 115-3 of the French Social Action and Families Code. In particular, the law prohibits electricity suppliers from cutting off electricity during the winter period (1 November to 15 March) as a result of unpaid bills, for the primary residences of persons who benefit or benefited, during the previous twelve months, from a favourable decision to grant housing solidarity fund assistance.

## Public Service contract

On 24 October 2005, a Public Service contract was signed by the State and EDF pursuant to Article 1 of the Law of 9 August 2004, now Article L. 121-46 of the French Energy Code. This contract details the commitments made by EDF and the State over the period 2005-2007 and states that the rules governing the financial consideration for service commitments will remain in force until a new contract is signed, as provided for in the contract itself.

### Purpose of the Public Service contract

The purpose of this contract is to provide a reference framework for the performance of the public service missions entrusted to EDF and its regulated subsidiaries on the open market for electricity in France.

### Commitments by EDF (excluding network managers)

EDF's public service commitments include:

- access to the Public Electricity Service and the supply of electricity to customers who choose to remain at regulated tariffs;
- production and sales. These areas include the implementation of the energy policy and maintaining secure power generation that is environmentally friendly;
- contributing to the safety of the electricity network. In this regard, EDF undertakes to sign several contracts with RTE, in particular concerning the optimisation of work on generation facilities and the availability of the resources required to maintain network balance.

### Commitments by network managers

In the Public Service contract, the ERDF and RTE network managers made commitments concerning the management of public networks and the safety of the electricity network. These commitments are financed by the Tariff for Using the Public Electricity Transmission and Distribution Networks (“TURPE”).

These commitments concern, above all, network safety, supply quality, third party safety and the preservation of the environment – four areas where customer and local authority expectations are especially high.

## More accessible services

On 28 September 2010, the State and EDF, as well as eight other public service operators, signed a partnership agreement entitled “+ de services au public” (“more public services”), which aims to develop access to a set of services intended for rural populations in France (information on bill payment, general information, travel ticket sales, etc.).

Reception staff and internet access points are some of the many resources made available to users through shared facilities such as Multiservice Conciliation Information Points (“PIMMS”), Public Service Relays (“RSP”) and other structures such as town halls. This protocol is being deployed in 23 départements.

## 6.5.3 Electricity market legislation

### 6.5.3.1 European Legislation

Three European directives were successively adopted in order to lay down the common rules for the generation, transmission, distribution and supply of electricity, which form the basis for the current organisation of the electricity market in France. Directive 96/92/EC of 19 December 1996 laid the foundation for opening up the electricity market to competition.

Directive 2003/54/EC of 26 June 2003 reiterated the major principles and took an additional step on the path to opening up the market, by progressively expanding eligibility to all customers.

Directive 2009/72/EC of 13 July 2009, known as the “third directive”, was adopted as part of the third Energy Package, a term that designates a set of legislation adopted on 13 July 2009. This directive primarily strengthens the guarantees of the independence of transmission system managers and increases the power of the national regulatory authorities.

### Regulations (EC) No. 1228/2003 of 26 June 2003 and No. 714/2009 of 13 July 2009

The conditions for access to the network for cross-border exchanges in electricity are currently defined by Regulation (EC) No. 714/2009 of the European Parliament and of the Council of 13 July 2009, which is part of the third Energy Package. This Regulation, inter alia, provides for a compensation mechanism between transmission systems operators for the costs incurred by hosting cross-border flows of electricity on their networks. This compensation is paid by the operators of the national transmission systems from which cross-border flows originate and the systems where those flows end.

### “Security of Electricity Supply” Directive 2005/89/EC of 18 January 2006

The “Security of Electricity Supply” Directive 2005/89/EC, which was adopted on 18 January 2006, is intended to provide a better definition of the responsibilities of the various operators, ensure that minimum operational standards are respected, maintain balance between demand and supply, and direct investments toward the systems. The objectives of this directive have been taken into account in various French laws and regulations.

### 6.5.3.2 French legislation: Energy Code

The various pieces of legislation on energy law (Law of 15 June 1906, Law no. 46-628 of 8 April 1946, Law no. 2000-108 of 10 February 2000, Law no. 2003-8 of 3 January 2003, Law no. 2004-803 of 9 August 2004, Law no. 2006-1537 of 7 December 2006 and Law no. 2010-1488 of 7 December 2010) were then incorporated into the French Energy Code by Order no. 2011-504 of 9 May 2011, in accordance with Authorisation Law no. 2009-526 of 12 May 2009, with the exception of provisions on nuclear energy, which were incorporated into the French Environment Code, pursuant to Order no. 2012-6 of 5 January 2012.

Directive 2009/72/EC of 13 July 2009 was transposed into French law by the aforementioned Order of 9 May 2011, which organised the legislative section of the French Energy Code, in accordance with Authorisation Law no. 2011-12 of 5 January 2011.

Moreover, the Policy Act that laid down energy policy guidelines (Law no. 2005-781 of 13 July 2005 – “LPOPE”), defined the energy policy priorities in France: supply security, reaffirmation of the role of nuclear power, competitive energy pricing, the fight against the greenhouse effect, and social and national cohesion.

## Generation facilities

Anyone can operate an electricity generation facility, subject, above a certain power threshold determined by decree, to obtaining an operating licence issued pursuant to Article L. 311-5 of the French Energy Code. The powers and responsibilities of local authorities with regard to electricity generation are defined in Articles L. 2224-32 and L. 2224-33 of the French Local Authorities Code, and in Article 88 of Law no. 2010-788 of 12 July 2010 on the national commitment to the environment.

## Regulated access to electricity from the existing nuclear fleet ("ARENH")

The rules governing regulated access to electricity from the existing nuclear fleet ("ARENH"), provided for in Articles L. 336-1 *et seq.* of the French Energy Code, have been implemented since 1 July 2011. See section 6.2.1.2.1.2 ("Competition") on this point.

## Choice of electricity supplier

All customers, without exception, have been eligible since 1 July 2007, *i.e.*, they may freely sign a contract for the purchase of electricity with a producer or supplier of their choice that is established on the territory of the European Union or on the territory of a State that is party to an international agreement with France (Article L. 331-1 of the French Energy Code).

Customers can choose to benefit from regulated electricity tariffs under the conditions set out in Articles L. 337-7 *et seq.* of the French Energy Code. Pursuant to these provisions:

- household and non-household customers whose power demand is less than or equal to 36kVA benefit from regulated tariffs, at their request and with no requirement to meet any conditions; this is also true for all customers in areas that are not interconnected to the continental metropolitan territory;
- household and non-household end users whose power demand is greater than 36kVA, who had not exercised their eligibility on 7 December 2010 may, until 31 December 2015, benefit from regulated sales tariffs. If said consumers exercised their eligibility after 7 December 2010, they may once again benefit from regulated sales tariffs and switch back and forth between regulated tariffs and new offers, subject to a one-year wait each time. After 1 January 2016, they will no longer benefit from regulated tariffs.

Article L. 111-84 of the French Energy Code requires internal accounts to be kept that make it possible to distinguish between supply to customers who exercised their right to eligibility and supply to customers at regulated tariffs. Member States or any other duly appointed authority will have a right of access to the electricity companies' accounts.

## Third party access to networks

Article L. 111-91 of the French Energy Code provides that network managers must guarantee access to the public transmission and distribution networks in order to:

- perform the public service missions to supply electricity at regulated electricity sales tariffs and at basic necessity special rates;
- perform electricity procurement contracts;
- perform electricity export agreements signed by a producer or by a supplier who is located on French national territory.

Disputes concerning third party access to networks are heard by the Settlement of Disputes and Sanctions Committee ("CoRDIS"), which is part of the Energy Regulation Commission ("CRE").

The Tariffs for Using the Public Transmission and Distribution Networks ("TURPE") mentioned in Articles L. 341-2 *et seq.* of the French Energy

Code, which are currently in force, were established by the ministerial decision of 5 June 2009.

By a decision dated 28 November 2012, the Council of State, ruling on an appeal lodged by the SIPPEREC, overturned the TURPE 3 decision in that it sets tariffs for using distribution networks, on the grounds that the CRE and the ministers used *"an incorrect method in law"* to determine the Weighted Average Cost of Capital (WACC) by failing to take into account, when calculating the WACC *"the specific accounts of concessions, which correspond to the contracting authorities' rights to recover the concession property free of charge at the end of the contract [...] as well as the provisions for the renewal of non-current assets"*.

The Council ordered the CRE and the ministers to take a new decision on distribution network use tariffs for the period 2009-2013 by 1 June 2013, at which time the retroactive annulment of the decision of 5 June 2009 will take effect.

For more details on the Tariffs for Using the Public Transmission and Distribution Networks, see section 6.2.2.4 ("Tariffs for Using the Public Electricity Transmission and Distribution Networks ("TURPE")") above.

## Electricity purchase obligations

EDF is subject to electricity purchase obligations.

Articles L. 311-10 *et seq.* of the French Energy Code provide that the Minister for Energy may, when generation capacities do not meet the objectives of the multi-year investment plan, launch a tendering procedure. EDF, in its capacity as a "producer", can submit a bid in response to this tendering procedure. EDF, in its capacity as a "buyer", is then required to enter into an electricity purchase contract with the selected applicant(s) (this is a protocol in the event that EDF, in its capacity as "producer", is itself the selected applicant).

Articles L. 314-1 *et seq.* of the French Energy Code moreover provide that EDF (as well as the LDCs that are responsible for supply in their service area) must sign a purchase contract, at the request of producers, for the electricity primarily generated by:

- facilities that recover household waste or that supply a heating network;
- facilities whose installed capacity does not exceed 12MW and that use renewable energy sources (in particular photovoltaic energy) or high-performance technologies in terms of energy efficiency, such as cogeneration;
- facilities that use wind-based mechanical energy and that are located within a wind power development area or in the public maritime domain or in the Economic Exclusive Zone;
- facilities that use energy recovery sources;
- windmills and water mills that are refurbished to generate electricity;
- in the overseas departments, electric facilities that generate electricity from biomass sources, including sugar cane.

These facilities may benefit only once from a purchase obligation contract, except in the specific case of certain hydroelectric plants that implement an investment programme defined by an Order of 10 August 2012.

Decree no. 2001-410 of 10 May 2001 provides that producers who benefit from the purchase obligation must sell all of their production to EDF and that the purchase agreement indicative models between EDF and the producers must be approved by the Minister for Energy. Purchasing terms and conditions, specifically the electricity purchase prices, are set by order of the Minister for Energy, after consulting the Higher Energy Council and the CRE.

Decree no. 2010-1510 of 9 December 2010 suspended, for three months as from 10 December 2010, the obligation to sign a contract to purchase the energy generated by photovoltaic facilities, with the exception, however, of facilities with power less than or equal to 3kWc, facilities with a current contract, and projects that are already well advanced.

At the end of this suspension period, a new regulatory framework became effective, which primarily comprises two orders. The new price conditions are laid down by an Order of 4 March 2011, which establishes several price formulas that primarily take into consideration the integrated or non-integrated nature of the facility, its peak power and the peak power of all the other facilities connected or planned on the same building or the same land parcel, as well as the use of the building on which the facility is located.

Purchase prices for electricity of photovoltaic origin are adjusted quarterly, based on the cumulative power of the facilities for which complete connection requests were made during the previous quarter. Some facilities, especially ground facilities, are the subject of quarterly sliding scale that does not take into account the volume of the connection requests filed with the network manager in question.

The arrangement is completed by a tendering procedure system for facilities on buildings of more than 100kWc, and ground facilities. The conditions for holding these tendering procedures are specified by the amended Decree of 4 December 2002 on the tendering procedure for electricity generation facilities. A tendering procedure involving photovoltaic facilities is pending as of the filing date of this reference document.

The additional costs resulting from contracts, which were signed pursuant to the obligation to purchase energy, paid by EDF and the LDCs tasked with supply, are compensated by the CSPE received from final consumers. The amount of estimated expenses to Public Electricity Service was elaluated by the CRE at €5.1 billion for 2013 (41% of which are for photovoltaic energy alone). The additional costs linked to the purchase obligation are estimated at €3.9 billion and represent 75% of the total amount of these costs.

### Mechanism for compensating the additional costs of public service

#### The Contribution to Public Electricity Service – “CSPE”

The Contribution to Public Electricity Service costs, which is provided for by Articles L. 121-6 *et seq.* of the French Energy Code, is intended to compensate the costs that are attributable to the public service missions assigned to EDF and the LDCs.

The law states that in principle, the following costs are compensated in full using the CSPE:

- for electricity generation:
  - the additional costs that result both from electricity purchase agreements entered into after tendering procedures (Articles L. 311-10 *et seq.* of the French Energy Code) and from purchase obligation agreements signed within the framework of Articles L. 314-1 *et seq.* of the French Energy Code, including when the facilities concerned are operated by EDF or an LDC,
  - additional generation costs in zones not interconnected to the continental metropolitan territory, which are not covered by the part of the regulated sales tariffs that is intended to compensate generation costs;
- for the supply of electricity:
  - loss of income and the additional costs incurred in the implementation of the special “basic necessity” rate (“TPN”),
  - costs incurred as a result of their participation in the plan established for low-income persons (within the limit of a percentage, which is set by order, of the cost borne by the supplier in respect of the TPN for the year in question).

The CSPE is collected directly from the final customer, either as an additional levy on regulated sales tariffs or on network usage tariffs or directly from power producers that produce power for their own use.

The mechanism for compensating public service costs is governed by Articles L. 121-9 *et seq.* of the French Energy Code, which were amended, *inter alia*, by Budget Act no. 2011-900 of 29 July 2011. Pursuant to these provisions:

- following a proposal by the CRE, each year the Minister for Energy sets the total amount of costs paid by EDF and the LDCs, as well as the amount of the CSPE; the increase in the amount of the contribution may be staggered over one year;
- if these amounts are not set by the minister before 31 December, the amounts proposed by the CRE automatically become effective on 1 January. For the amount of the CSPE, this automatic entry into effect is nevertheless limited to €0.003/kWh compared to the amount applicable before this date.

As an exception to these provisions, Article 56 of the Amended Budget Act for 2011 set the amount of the CSPE at €9/MWh for the period from 31 July 2011 to 30 June 2012, then at €10.50/MWh from 1 July to 31 December 2012<sup>1</sup>.

Since 1 January 2011, the CSPE is capped at €550,000 per consumption site per year. Since 2011, this limit is updated each year in a proportion equal to the provisional rate of increase in the price index (excluding tobacco). In addition, the total amount due for this contribution by any industrial company that consumes more than 7GWh of electricity per year is limited to a maximum of 0.5% of its added value.

The massive expansion of facilities that generate electricity using renewable energy sources (mainly wind power and photovoltaic facilities) and that benefit from the purchase obligation, has led to a significant increase in the costs to be compensated by the CSPE. This phenomenon continues today: accordingly, the CRE forecasts costs for 2013 of €5.1 billion that are 43% higher than the costs for 2011 (€3.6 billion). Since 2007, the amount of the CSPE has not been enough to compensate the increase in these costs. The deficit of a mechanism that is paid for exclusively by EDF weighs on the Group's debt.

On 14 January 2013, EDF announced that it had reached an agreement with the authorities, which provides for the repayment of debt formed by the CSPE deficit at 31 December 2012 (around €4.3 billion, a figure that will be adjusted before 31 December 2013 to reflect the amount of deficits related to public service charges as confirmed by the CRE) and brokerage costs incurred by the Group (€0.6 billion). Under this agreement, this debt of around €4.9 billion will be paid off by 31 December 2018, according to a progressive repayment schedule, and will be remunerated at market conditions. As a result of this agreement, in its 2012 financial statements the Group recognised financial income of €0.6 billion, which corresponds to past accrued brokerage costs as of 31 December 2012.

#### Compensation for additional distribution costs

The remit of the Electricity Equalisation Fund (*Fonds de péréquation de l'électricité* – FPE), the accounting management of which is entrusted to EDF under Article L. 121-29 of the French Energy Code, is to distribute the charges incurred as a result of public service missions assigned for managing the electricity distribution networks among the operators concerned, in particular those linked to the specificities of the networks operated and that will not be covered by the tariffs for using the public electricity transmission and distribution networks. The charges linked to involvement in the development of areas with particular geographical, economic or social difficulties, as defined by Article 42 of Law no. 95-115 of 4 February 1995, are also concerned.

#### Capacity guarantees

Articles L. 335-1 *et seq.* of the French Energy Code, which are taken from the NOME law, obligate each electricity supplier to contribute to the security of electricity supply on continental metropolitan territory, in light of its customers' energy consumption patterns. Under penalty of an administrative

1. In a decision dated 13 October 2011, the CRE stated that, in order to completely compensate the public electricity service costs (€5.2 billion), the CSPE for 2012 should have amounted to €13.7/MWh. The decision adds, however, that given the amounts set by the Amended Budget Act for 2011, EDF is expected to have a compensation shortfall of €1.3 billion in 2012.

sanction, each supplier must therefore provide direct or indirect guarantees of its capacities to interrupt electricity consumption and generation, which can be implemented to ensure balance between generation and consumption, in particular at peak periods. The decree issued following consultation of the French Supreme Administrative Court that specifies how this system will work in practice was published in the Official Journal of 18 December 2012 (Decree no. 2012-1405 of 14 December 2012).

The decree provides, as a transitional measure and while awaiting the effective implementation of the capacity mechanism (winter 2016-2017) for the CRE to organise “on behalf of suppliers” and under the conditions defined by the Minister for Energy, a call for tenders for the 2015-2016 winter period.

## Electricity sector regulation

### The Energy Regulation Commission

The Energy Regulation Commission (“CRE”) is an independent administrative authority created by Article 28 of the Law of 10 February 2000.

Articles L. 131-1 *et seq.* of the French Energy Code give a general definition of the remit of the CRE, which is tasked with improving the situation of final consumers, and contributing to the correct functioning of the electricity and natural gas markets. In this respect, the CRE ensures, in particular, that the conditions for access to electricity and natural gas transmission and distribution networks do not impede the development of competition.

The CRE has both advisory powers (power to recommend and issue an opinion), and decision-making powers (approval power and regulatory power).

The CRE makes proposals to the Ministers for the Economy and for Energy regarding the amount of the costs that are attributable to the public service missions assigned to power producers, and the net amount of the related contributions. Starting in 2013, the price of regulated access to electricity from the existing nuclear fleet (“ARENH”) will be defined on the basis of a proposal by the CRE; the same will apply as from 2016 for regulated sales tariffs and the transfer rate. Moreover, the CRE now has decision-making power to set Tariffs for Use of the Public Transmission and Distribution Networks: it notifies its decision, with the attendant reasons, to the administrative authority, which merely has the power to ask the CRE for a new deliberation. The CRE also has significant powers to obtain information and hold investigations, as well as authority to settle disputes and to apply penalties, through the Settlement of Disputes and Sanctions Committee (“CoRDIS”).

Furthermore, Regulation (EC) No. 713/2009 of the European Parliament and of the Council of 13 July 2009, established an Agency for the Cooperation of Energy Regulators (ACER). ACER will participate in the creation of network codes in the electricity and gas sectors, and can make decisions relating to cross-border infrastructures (see also section 6.5.6.2.5 (“Regulations applicable to renewable energy generation”).

## 6.5.4 Gas market legislation

### 6.5.4.1 Community legislation

Directive 98/30/EC of 22 June 1998 and Directive 2003/55/EC of 26 June 2003 were the major steps towards opening up the gas market to competition.

New rules aimed at improving the functioning of the internal natural gas market were defined in Directive 2009/73/EC of 13 July 2009, which was transposed into the French Energy Code by Order no. 2011-504 of 9 May 2011 and by Regulation (EC) No. 715/2009 of 13 July 2009 on conditions for access to the natural gas transmission networks.

### 6.5.4.2 French legislation: Energy Code

Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 was transposed into French law by Order no. 2011-504 of 9 May 2011, which organised the legislative section of the French Energy Code. The Energy Code entered into force on 1 June 2011.

#### Access to natural gas networks

The French Energy Code provides that customers, suppliers and their agents have a right to access natural gas transmission and distribution infrastructures, as well as LNG facilities, under the terms and conditions set forth in an agreement with the operators that run them.

Natural gas network operators must refrain from discriminating between users or categories of users in any way.

#### Customers

Since 1 July 2007, all customers can freely choose their supplier.

Pursuant to the provisions of Article L. 445-4 of the French Energy Code, household and non-household customers who consume less than 30,000kWh per year may benefit from regulated tariffs, at their request and without having to meet any conditions. Household customers who are entitled to the special “basic necessity” rate for electricity, may benefit from a special solidarity rate applicable to the supply of natural gas and related services for part of their consumption. The conditions for application of this provision are specified by Decree no. 2008-778 of 13 August 2008 on the supply of natural gas at the special solidarity rate, as amended by Decree no. 2012-309 of 6 March 2012 on the automation of procedures for allocating social tariffs for electricity and natural gas. The additional costs that result from supply at this rate are compensated by a contribution due by natural gas suppliers, based on the quantities of natural gas sold by these suppliers to final customers.

Customers whose consumption exceeds 30,000kWh per year can only benefit from regulated gas sales tariffs for a site if no new offer has been accepted for such site, pursuant to Article L. 445-4 paragraph 2 of the French Energy Code.

#### Suppliers

Article L. 443-4 of the French Energy Code defines suppliers as persons who (i) are established on the territory of a Member State of the European Union or on the territory of another State pursuant to international agreements, and (ii) hold a licence issued by the Minister for Energy.

EDF is authorised to supply natural gas to non-household customers that do not provide services in the public interest, pursuant to an Order of the Deputy Minister of Industry of 14 September 2004, and pursuant to an Order of 9 August 2005, to non-household customers that provide services in the public interest, as well as to natural gas distributors and suppliers, and pursuant to an Order of 15 June 2007, to household customers.

EDF only supplies its clients pursuant to a new offer and not at regulated sales tariffs, which can only be proposed by GDF Suez and the LDCs tasked with supplying gas.

#### Underground storage and third-party access to natural gas storage facilities

The French Energy Code requires all suppliers to hold, on 31 October of each year, directly or indirectly through an agent, sufficient inventories of natural gas in France to meet their direct or indirect contractual obligations to supply household customers and other customers that provide services in the public interest or that have not contractually accepted interruptible gas supply, during the period between 1 November and 31 March.



Decree no. 2006-1034 of 21 August 2006, as amended, specifies the legal framework that applies to underground storage facilities for natural gas.

## Control and penalties

The French Energy Code grants the Minister for Energy and for the Economy, as well as the Energy Regulation Commission, power to oversee the gas market. The Minister for Energy may also levy a fine, or withdraw or suspend an authorisation to supply natural gas. The CRE can carry out investigations into whether offences that breach the provisions of the French Energy Code have been committed (Article L. 135-13 of the French Energy Code).

## 6.5.5 Public electricity distribution concessions

### French legal system applicable to concessions

In accordance with Articles L. 322-1 *et seq.* of the French Energy Code and Article L. 2224-31 of the French Local Authorities Code, the public distribution of electricity is operated under a system of public service concessions. Pursuant to this body of law, the contracting authorities organise public electricity distribution service through concession agreements and specifications that set forth the respective rights and obligations of the contracting authority and the operator. Currently, the contracting authorities are most often public institutions for inter-municipal cooperation, and increasingly inter-département cooperation.

The unbundling of supply and network operations required under Community Directives has led to the identification of two separate public service missions: first, the mission to supply electricity at regulated tariffs assigned to EDF and the LDCs in their exclusive service areas and, second, the mission to develop and operate the public electricity distribution networks assigned to ERDF and the LDCs in their service areas, and to EDF for areas which are not interconnected to the continental metropolitan network.

Article L. 334-3 of the French Energy Code provides that the signature of new concession agreements and amendments, as well as renewals of existing concession agreements must be executed by three parties: the contracting authority, the distribution network manager (for the provisions relating to management of the public distribution network) and by EDF (or the LDC having the authority in the geographic area) for supply at regulated tariffs. The current concession agreements in force are deemed to have been signed jointly by these three entities.

### Rights of the contracting authorities

The rights of the contracting authorities are detailed in section 6.2.2.2.2 ("Distribution activities") above.

## 6.5.6 Regulations applicable to the environment, nuclear facilities, health, hygiene and safety

EDF's business in France, as well as in other countries where EDF operates, is subject to regulations applicable to the environment, nuclear power, health, hygiene and safety. Compliance with these increasingly strict and continuously changing regulations exposes the Group to significant costs in order to ensure it does business compliantly.

## 6.5.6.1 Basic regulations applicable to the environment, health, hygiene and safety

### Environmental regulations

#### Grenelle Laws 1 and 2

Following the Grenelle Environmental Forum that was initiated in 2007, in Law no. 2009-967 of 3 August 2009, known as the "Grenelle 1 Law", the French government undertook to meet a certain number of objectives and to implement certain environmental measures concerning the reduction of greenhouse gas emissions, energy efficiency, the development of renewable energy sources, ensuring clean bodies of water, the protection of biodiversity, the prevention of risks to health and the environment, waste management and ecological governance.

These commitments and objectives were implemented by Law no. 2010-788 of 12 July 2010, many provisions of which impact EDF's activities. The vast majority of the decrees adopted to implement the Grenelle 2 Law have been published (86% in 31 December 2012), however some of them, which are likely to affect EDF, have not yet been published (see section 6.5.8.2 ("Future regulations at national level")).

#### Public involvement in environmental matters

Law no. 2012-1460 of 27 December 2012 on the implementation of the principle of public involvement recast the applicable procedure for the public to be involved in decisions by the State and public institutions (other than individual decisions) that have an impact on the environment, as from 1 January 2013. The order that will specify the rules for consulting individual decisions will appear in 2013.

#### Environmental Liability ("LRE" law)

The purpose of the Law of 1 August 2008 on environmental liability ("LRE"), which is incorporated into the French Environment Code under Articles L. 160-1 to L. 165-2, is to promote the prevention and remedying of environmental damage to water, soil and biodiversity that reaches a certain level of seriousness. The remedy must be environmental only and must allow the natural environment to return to its previous state or an equivalent state.

#### Balanced management of Water Resources

The Law on Water and the Aquatic Environment of 30 December 2006 strengthened the restrictions EDF must comply with in particular as regards the minimum rate of water flow downstream of dams, the possibility of having its operating licences (authorisation) amended or cancelled if significant disturbances are caused to certain migrating fish by the operation of the site, changes in waterway classifications to prevent the construction of new sites and new requirements when operating licences are renewed. However, the minimum rate flow requirement may be more flexible in certain cases, particularly for sites contributing to peak production (Decree no. 2010-1391 of 12 November 2010). Administrative procedures have also been simplified, which will facilitate the installation of additional hydroelectric equipment.

#### Protection of biodiversity

As an occupant and user of natural land and water areas, EDF is directly concerned by biodiversity issues.

In order to protect and restore biodiversity, the Grenelle Environmental Forum set ambitious targets, such as the implementation of a national strategy for the creation of protected land areas ("SCAP"), which will provide extensive protection, by 2019, for at least 2% of metropolitan French land mass and the construction of a green and blue belt (a new tool for land-use planning that should make it possible "to halt the loss of biodiversity" by setting up green corridors to connect protected areas, thereby enabling flora and fauna to migrate).

The provisions on the green and blue belt, which are now incorporated in the French Environment Code in Articles L. 371-1 to L. 371-6, must be implemented, firstly, using "national guidelines" stipulated by decree and, secondly, through "regional green coherence schemes" ("SRCE") that are currently being developed by the Regions and the State, in consultation with all local stakeholders. Decree no. 2012-1492 of 27 December 2012 on the green and blue belt specifies the components of the belt, the contents of national policies for the preservation and rehabilitation of ecological continuity and the contents of the procedure for drawing up regional green coherence schemes ("SRCE"). This legislation will be further completed by a decree to approve the national policies.

### Social and environmental reporting obligation for businesses ("RSE")

Articles L. 225-102-1 and R. 225-104 of the French Commercial Code require companies whose securities are admitted to trading on a regulated market, as well as companies that employ more than 500 staff and whose revenue or balance sheet total exceeds €100 million (for the latter, according to a schedule that covers the years 2012 to 2014), to disclose in the management report information on how they take into consideration the social and environmental consequences of their activity, as well as on their societal commitments to sustainable development ("RSE reporting"). EDF and some of its subsidiaries are concerned by these provisions.

Article L. 225-102-1 of the French Commercial Code authorises subsidiaries and controlled companies not to disclose their RSE information, provided that this information is published by the company that controls them, in detail by subsidiary or by controlled company, and that they state how to access this information in their own management report. Moreover, when subsidiaries and controlled companies are established in France and have facilities that are classified for the protection of the environment ("ICPE") that are subject to authorisation and registration), the information provided must concern each of them, if the information cannot be consolidated.

The social and environmental information provided in the management report must be verified, according to a schedule that takes into account, for non-listed companies, the number of employees and their revenue, by a third party independent organisation, which is appointed in accordance with the provisions of Article R. 225-105-2 of the French Commercial Code. This verification leads to a certificate concerning the presence in the management report of all the required information and a substantiated opinion on the accuracy of the information itself. The order that will determine how this organisation will perform its assignment is still awaiting publication (see section 6.6 ("Corporate responsibility")).

### PCBs and PCTs

The Group is subject to Regulations on polychlorobiphenyls (PCBs) and polychloroterphenyls (PCTs) in the various countries where it operates, particularly in Europe.

Directive 96/59/EC of 16 September 1996 required that an inventory of equipment containing PCBs and PCTs at levels of more than 500 ppm be drawn up, together with a national plan for decontamination and the gradual disposal of these substances, which are mainly found in certain electricity transformers and condensers. Decontamination of equipment containing these substances was to be completed by 31 December 2010 at the latest. EDF had a special disposal plan and has achieved this objective (see also section 6.6 ("Corporate responsibility")).

### Greenhouse gases

#### Quota exchange system

Some of the EDF Group's activities fall within the scope of application of Directive 2003/87/EC of 13 October 2003, as amended by Directive 2009/29/EU of 23 April 2009, which established a European scheme for greenhouse gas ("GHG") emission allowance trading, using the project

mechanisms set forth in the Kyoto Protocol (the Emissions Trading System (ETS) Directive).

In France, this Directive was transposed and integrated into Articles L. 229-5, R. 229-5 *et seq.* of the French Environment Code. The Group has an annual obligation to surrender allowances equal to the level of CO<sub>2</sub> emitted by its facilities. In order to comply with this obligation, under certain conditions, EDF may use credits issued under projects eligible for the project mechanisms provided for under Articles 6 and 12 of the Kyoto Protocol (parties acting jointly to fulfil obligations and clean development mechanism).

Article 18 of Budget Act no. 2011-1977 of 28 December 2011 for 2012 created a special tax equal to 0.052% of the revenue generated in 2011 by businesses that benefit from CO<sub>2</sub> allowances, in respect of the period running from 1 January 2008 to 31 December 2012. In this regard, EDF paid €21,813,865 during the first half of 2012. The proceeds from this tax were intended to enable the State to finance the acquisition of missing allowances for new entrants for 2011 (estimated at 30 million allowances). The main sectors asked to contribute were electricity and gas generation, the oil industries, the chemical and metal industries. The budget act for 2013 did not renew this tax.

Under the ETS Directive, which was amended in 2009, the third period for the greenhouse gas ("GHG") quota exchange systems started on 1 January 2013. The provisions of the French Environment Code on this system were amended accordingly by an Order of 28 June 2012 (no. 2012-827) and its implementing Decree of 3 December 2012 (no. 2012-1343). The rule for the electricity sector is now the auctioning of quotas, starting on 1 January 2013. Since that date, EDF has to purchase 100% of its allowances. Regulation (EC) 1031/2010 of 12 November 2010 specifies the terms and conditions applicable to these auctions.

### GHG Reporting

Pursuant to Articles L. 229-25 and R. 229-45 *et seq.* of the French Environment Code, companies with over 500 employees must provide an annual report on their greenhouse gas emissions and a summary of the action they plan to take to reduce such emissions.

The information disclosed is made public and must be updated every three years. The first EDF report was published in the Indicators section of the EDF annual report in March 2012.

### Energy efficiency

#### Energy efficiency directive

On 25 October 2012, the European Union adopted a directive on energy efficiency (2012/27/EU). The purpose of this directive, which must be transposed by Member States before 5 June 2014, is to enable the European Union to reach its energy savings target of 20% by 2020. With this aim in mind, the directive boosts the provisions of existing directives on energy efficiency services (2006/32/EC) and cogeneration (2004/8/EC), which it abrogates.

The directive contains several provisions that are liable to impact the activities of the EDF Group, first and foremost of which is the obligation for Member States to reach an energy savings target each year that is equivalent to an aggregate annual reduction in energy sales of 1.5% over the period 2014-2020, which can take the form of an obligation for energy distributors and/or suppliers to reduce sales. It also contains provisions on providing customers with information on their consumption, the promotion of energy services, heat and cold production effectiveness, and the transmission and distribution of energy.

#### Energy savings certificates

At national level, the energy savings certificates mechanism set forth in Articles L. 221-1 *et seq.* of the French Energy Code places energy suppliers under the obligation to save energy. This mechanism defined a three-year

objective that is shared between persons subject to an obligation to achieve energy savings (the “obligors”) based on their sales volumes. For the second period of the mechanism running from 1 January 2011 to 31 December 2013, the total savings objective announced is 345TWhc (compared to 54TWhc for the first period). The final volume will be decided and notified to parties no later than 31 March 2014 after a certified declaration by the obligor undertakings via a certified accountant or a statutory auditor, of the annual quantities of energy sold over the period. At the end of the relevant period, the “obligors” must produce energy savings certificates corresponding to the amount of the energy savings they are under the obligation to achieve, obtained either by carrying out (directly or indirectly) energy savings actions or by purchasing credits from the other “eligible” economic players through the national register of certificates. Failure to produce energy savings certificates is subject to penalties.

In 2012, the French State started talks with stakeholders on the energy savings objectives for the third period of the energy savings certificates mechanism (2014-2016) and the details of this mechanism. The extent of energy providers’ obligations in respect of the third period for the national mechanism for energy savings certificates could be increased depending on the rules chosen for the transposition of the energy efficiency directive. In this context, EDF has made proposals to optimise the cost and the effectiveness of the mechanism for stakeholders.

### Natural sites and classified sites (buried lines)

The EDF Group is also subject to regulations on classified and protected sites, according to which electricity lines in France must be buried underground if they are located in classified sites or in national parks.

### Protection of the environment through criminal law

Directive 2008/99/EC of 19 November 2008 on the protection of the environment through criminal law, the main purpose of which is identifying conduct that leads to serious environmental damage that must be punished by all Member States, was at the origin of French Order no. 2012-34 of 11 January 2012, which harmonised the criminal penalties laid down in the French Environment Code.

### Regulations applicable to health, hygiene and safety

#### Asbestos

In France, the regulations require, among other things, the identification of materials containing asbestos in buildings and, if necessary, monitoring procedures or asbestos removal work. EDF is also subject to regulatory obligations to inform and protect workers who may be exposed to asbestos dust inhalation.

#### Legionella

EDF operates air cooling towers needed, in particular, for its electricity generation business, which are now subject to ICPE Regulations. EDF must, among other obligations, carry out a methodical analysis of the risk of proliferation of legionella in its air cooling towers and implement a preventive maintenance plan for cleaning and disinfection. EDF is also required to carry out analyses once or twice a month, depending on the type of facility involved.

#### Nanoparticle substances

As from 1 January 2013, Articles L. 523-1 et seq. and R. 523-12 et seq. of the French Environment Code provide for a compulsory reporting obligation on the quantities and uses of nanoparticle substances or nanomaterials produced, distributed or imported in France. Information on these substances must be made available to the public and to inspection authorities. The

information to declare and the rules governing the declaration were specified in and Order of 6 August 2012. EDF is likely to be concerned by these provisions as it uses nanoparticle substances.

### Exposure to Electromagnetic Fields (EMF)

Pursuant to the Grenelle 2 Law, Decree no. 2011-1697 of 1 December 2011 requires managers of public electricity transmission networks to perform regular verifications of the EMF caused by electric lines transmitting electricity.

### Chemical products

Regulation (EC) No. 1907/2006 on the registration, evaluation and authorisation of chemicals, known as “REACH”, came into force on 1 June 2007 and is designed to ensure a high level of protection of human health and the environment, as well as the free movement of substances within the internal market while improving competitiveness and innovation. EDF is affected by this Regulation as a user, but also as a manufacturer and importer of chemical products. EDF has complied with its obligation to register substances that it manufactures or imports in quantities of more than 1,000 tonnes per year with the European Chemicals Agency. For the next registration deadline in May 2013, EDF is now preparing to register monochloramine that is manufactured in situ at certain nuclear plants.

In addition, Directive 98/8/EC of the European Parliament and of the Council of 16 February 1998 concerning the placing of biocidal products on the market<sup>1</sup>, which was transposed into Articles L. 522-1 et seq. of the French Environment Code, established, inter alia, a system of authorisations for placing on the market of biocidal products in Europe. It will be abrogated in September 2013, the date of entry in force of the new Biocides Regulation (EU) No. 528/2012 of 22 May 2012, the main aim of which is to simplify the current procedure for authorising the placing on the market of biocidal products and to extend its scope of application. In this new regulatory environment, EDF could be concerned as a manufacturer of monochloramine and sodium hypochlorite, due to the extension of the scope of application of this future regulation to the in situ generation of active substances. Where necessary, applications for authorisation must be completed and filed before 2017.

## 6.5.6.2 Regulations applicable to EDF group facilities and activities

### 6.5.6.2.1 Regulations applicable to facilities classified for the protection of the environment (“ICPEs”)

#### Facilities subject to authorisation

Certain facilities operated in France by EDF, in particular fossil-fuel fired power plants, are subject to legislation on facilities that are classified for the protection of the environment (“ICPEs”), which is organised in the French Environment Code. These facilities are subject to either a prior declaration, a simplified authorisation (called “registration”) or to an authorisation depending on the magnitude of danger or adverse effects they may cause to the environment or public health. Applications for authorisation to operate an ICPE must include a file providing an analysis of the impact of the project on the environment, known as an “impact study”. This study provides an analysis of the effects of the facilities on the environment and human health. ICPE authorisation is granted after a public inquiry has been held in accordance with the provisions of the French Environment Code. Since 1 June 2012, the provisions governing impact studies and public inquiries have been overhauled.

1. The Directive defines biocidal products as active substances and preparations containing one or more active substances, intended to destroy, deter, render harmless, prevent the action of, or otherwise exert a controlling effect on any harmful organism by chemical or biological means.

The ICPE Regulation also requires that the site be restored when a facility is taken out of service depending on the expected future use of the land. Under Article L. 516-1 of the French Environment Code, lodging financial guarantees is also required for certain facilities, such as quarries, waste disposal facilities, Seveso facilities and geological carbon dioxide disposal sites, as well as, since Decree no. 2012-633 of 3 May 2012, certain ICPE facilities that are subject to the authorisation and registration system (Article R. 516-2 of the French Environment Code). The list of the ICPEs that will now be required to lodge financial guarantees, as from 1 July 2012 or 1 July 2017, is laid down in the schedule to an Order of 31 May 2012. The rules for determining and lodging these financial guarantees are respectively laid down by Orders of 31 May 2012 and 31 July 2012. The EDF Group operates facilities that are concerned by these new requirements.

Depending on the type of danger or adverse effect each category of facility could cause, the financial guarantees are designed to ensure the on-going surveillance of the site and safety of the facilities, potential measures that must be taken in case of an accident before or after closing of the site and decontamination of the site once it has been closed. These guarantees do not cover compensation owed by the operator to third parties who may suffer damages due to pollution or an accident caused by the facilities.

ICPEs are placed under the authority of the Prefect and the Regional Directorates for the Environment, Land Planning and Housing ("DREAL"), which are responsible for organising inspections of classified facilities. If the operator of an ICPE fails to comply with the conditions for its operations, and independently of any criminal action, the Prefect may order administrative penalties, such as the deposit of an amount equal to the cost of the works to be performed to make the facilities compliant, court-ordered enforcement of the measures ordered per the Prefect's Decision, suspension of operations, or even a proposal to shut down or decommission the facility by way of a decree issued by the Council of State.

### Seveso facilities

"Seveso" ICPEs are governed by the provisions of the Seveso 2 Directive (96/82/EC) and, as from 1 June 2015, the provisions of the Seveso 3 Directive (2012/18 of 4 July 2012).

This draft amendment, which should apply as of 1 June 2015, aims, among other things, to incorporate into French legislation the changes made by the CLP Regulation of 16 December 2008 on the classification, labelling and packaging of dangerous substances and mixtures. This modification is likely to impact the Group to the extent that certain products that were not covered by the Seveso regulations up until now may be included in the future when the use of the CLP list is adopted. Among other important changes proposed are a set of stricter provisions concerning access by the public to information related to safety, public participation in the decision-making process and access to justice, as well as improvements in the way information is collected, managed, made available and shared. The proposal also introduces stricter inspection standards for facilities. Legislative and regulatory provision should be adopted in the current year of 2013.

### Health and safety provisions

Directive 2010/75/EU of 24 November 2010 on industrial emissions (known as the "IED" Directive) revised and recast into a single piece of legislation several existing Directives, including the IPPC, LCP, Waste Incineration and VOC Directives, among others. Chapter III of this Directive affects EDF in particular as it regulates the combustion plants using fossil-fuel fired plants. The level of requirements applicable to these plants depends on the type of facilities and fuel used and, in particular, the nominal thermal power of the combustion plants concerned. This Directive has been partially transposed into French law via Order no. 2012-7 of 5 January 2012 (added to the French Environment Code under Articles L. 515-28 to L. 515-31) has the effect of broadening the scope of application of the IPPC Directive to include new activities, strengthening the application of the best available techniques (BAT) on which the fixed emission limit values will be based, causing a periodic reconsideration of operating conditions in order to take into

account changes in BAT and, in certain cases, requiring a "baseline report" on the state of soil. A draft decree and several draft orders to implement these measures are currently being prepared. On the latter point, Article 1 of Decree no. 2013-5 of 2 January 2013 on the prevention and treatment of soil pollution states that interim analysis of the soil will now be required in the event of a substantive change of the facility and, if pollution occurs, the operator must propose measures.

### 6.5.6.2.2 Specific regulations applicable to basic nuclear facilities

EDF is subject in France to Law no. 2006-686 of 13 June 2006 on transparency and safety in the nuclear field (the "TSN law", integrated into the French Environment Code via Order no. 2012-6 of 5 January 2012) and to Decree no. 2007-1557 of 2 November 2007, as amended, that implemented this Law. This legislation establishes the legal system applicable to Basic Nuclear Facilities ("BNF"). The Law created the Nuclear Safety Authority ("NSA"), an independent government agency, with the ministers for nuclear safety retaining authority to issue the main authorisations and draft general regulations.

The TSN Law provides that the establishment of Basic Nuclear Facilities may be authorised after a public inquiry has been conducted by way of a Decree issued by the Prime Minister. This Decree is issued after an opinion from the French NSA has been given and is based on the report from the ministers for nuclear safety. The Decree authorising a Basic Nuclear Facility defines the identity of the operator, records the type and capacity of the facility. It sets a time limit to commission the facility and sets the frequency of safety inspections if not equal to 10 years. Finally, the decree also lays down requirements to ensure the public health, the sanitation and the safety, and the protection of nature and the environment. The commissioning authorisation is granted by the NSA. Subsequent safety inspections assess the compliance of the facilities with the applicable regulations and update the assessment of the risks that the facility poses to the interests mentioned above.

Pursuant to the decree that authorises the facility to be set up, the conditions applicable to pumping water, discharging liquid and gaseous wastes – whether radioactive or not – as well as the related limits placed on these activities are set by an NSA decision; decisions that set the limits for discharges by facilities into the environment require approval.

The NSA also issues regulations pursuant to the decree that authorises the facility to be set up, in order to prevent or limit the effects of any accidents or incidents, to define measures to protect residents on an individual and collective basis, limit noise pollution and manage the waste generated by and stored at the facilities.

### Rules on the safety and inspection of nuclear facilities

The nuclear facilities operated by EDF are subject to nuclear safety regulations. Thus, an application for authorisation to set up a BNF includes a preliminary safety report ("PSR"), a study of the impact of the facility on the environment and health, a decommissioning plan and a risk management study ("RMS"). Basic Nuclear Facilities must also comply with the general rules defined by ministerial decision to protect against risks related to public safety, health and sanitation and to protect nature and the environment. An Internal Emergency Plan ("PUI") that specifies the organisational measures, intervention methods and resources to be implemented in the event of an emergency situation must be established by the operator. In addition, the operator must also prepare an annual report that is submitted to the Committee for Health, Safety and Working Conditions ("CHSCT"), which is made public and which describes, in particular, the measures taken in terms of nuclear safety and radiation protection. Moreover, any accident or incident, whether nuclear-related or not, which has or may have material consequences on the safety of a Basic Nuclear Facility must be declared immediately by the operator to the NSA, among other authorities, and to the State representative in the département where the incident or accident took place.



The NSA also has the authority to issue regulatory decisions of a technical nature to complete the terms and conditions for application of the decrees and orders issued in the field of nuclear safety and radiation protection. These decisions are subject to the approval of the relevant ministers.

The TSN Law also includes provisions concerning information to be provided to the public on nuclear safety and transparency, such as the creation of a High Committee for transparency and information on nuclear safety or the possibility given to any person to ask the operator directly for information on the risks involved in exposure to ionising radiation and on the safety and radiation protection measures adopted to prevent or reduce these exposure risks.

Finally, increasingly harsh administrative and criminal law penalties have been established to punish Basic Nuclear Facilities operators who do not comply with their legal and regulatory obligations, such as a three-year prison sentence and a €150,000 fine if a Basic Nuclear Facility is operated without authorisation, or a one-year prison sentence and a €30,000 fine if radioactive substances are transported without authorisation or approval.

### Decommissioning of nuclear facilities

The final shutdown and decommissioning of a Basic Nuclear Facility are authorised by decree once the NSA has issued an opinion that defines the specifications for decommissioning. Once the decommissioning has been completed, the operator must send the NSA a declassification request. Subject to the procedure provided in the Basic Nuclear Facility Decree, the NSA will issue a declassification decision which will be subject to approval.

### Radioactive waste

EDF's business is subject to French regulations on the handling, storage and disposal of radioactive waste. EDF bears liability for the radioactive waste resulting from its operations. In France, radioactive waste is managed by the National Agency for Radioactive Waste Management (ANDRA<sup>1</sup>), a public institution of industrial and commercial nature created by the Law of 30 December 1991.

The method of storage and disposal used for radioactive waste in France depends on its level of radioactivity and lifespan of radioactivity. In addition to some temporary storage on EDF sites, very low-level waste produced by EDF (for example, concrete or metal waste from the decommissioning of a nuclear power plant) is disposed of on an ANDRA site opened in 2003. Short-life, low or intermediate-level radioactive waste that is produced by EDF's operations is disposed of above ground at the ANDRA storage centre in the Aube (see section 6.2.1.1.3.4 ("The nuclear fuel cycle and related issues")). Long-life, high-level waste produced from the treatment of spent fuel is vitrified and stored temporarily at the AREVA NC (formerly Cogema) centre in La Hague pending the adoption of a long-term management solution (see section 6.2.1.1.3.4 ("The nuclear fuel cycle and related issues")). Long-life, intermediate-level waste (for example, from shells, nozzles, sheaths, etc.) is either cemented or compacted and confined in stainless steel containers. This type of waste is currently in intermediate, temporary storage pending a final decision concerning long-term management (see section 6.2.1.1.3.4 ("The nuclear fuel cycle and related issues")).

Following the adoption of Policy Act no. 2006-739 of 28 June 2006 on sustainable management of radioactive materials and waste, research and studies concerning long-life high and intermediate-level waste are being carried out in the following three inter-related areas:

- separation and transformation of long-life radioactive elements, in order to obtain an evaluation of industrial prospects of related industrial sectors by 2012, and to commission a new prototype facility before 31 December 2020;
- reversible, deep geological disposal, with the choice and design of a disposal centre. It should be possible to file an application for authorisation that would be reviewed in 2015 and, subject to authorisation, the storage centre could be commissioned in 2025;
- temporary storage: in order to create new temporary storage facilities or modify the existing facilities no later than 2015.

The Law of 28 June 2006 provides for a National Management Plan for Radioactive Materials and Waste to be updated every three years, which will contain an assessment of current management methods and identify the foreseeable temporary storage and permanent disposal needs. It specifies that a deep geological disposal centre constitutes a Basic Nuclear Facility, for which the construction authorisation requires a public inquiry and, subsequently, a decree issued following consultation of the French Supreme Administrative Court. This Law also defines the organisation and the financing of radioactive waste management. Finally, it also provides the terms for a framework to evaluate and cover the costs of decommissioning Basic Nuclear Facilities, as well as managing spent fuels and radioactive waste. In particular, the assets allocated to cover provisions cannot be used for any other purpose by the operator, and separate accounting procedures for these assets must be used. The implementation of these provisions will be monitored by the French administrative authorities, i.e. the Minister for the Economy and the Minister for Energy. They themselves are overseen by a National Commission that evaluates the costs of financing the decommissioning of Basic Nuclear Facilities and managing spent fuels and radioactive waste.

In France, the transport of radioactive waste is as regulations on the national and international transport of hazardous goods, under the control of the NSA. The NSA conducts a critical analysis of the safety files submitted by applicants to obtain approval of their packaging standards. The objective of these regulations is to prevent the loss or disappearance of packages containing nuclear materials, particularly during transport, and to ensure the safety of the population and the environment by controlling the risks of contamination by packages containing nuclear materials.

Decree no. 2007-243 of 23 February 2007 on securing the financing of costs in the nuclear industry sets forth the terms and conditions for implementing the Policy Act of June 2006.

Accordingly, the operator evaluates costs using five categories (costs to decommission nuclear facilities, costs to manage spent fuel, etc.) which are divided into operations defined on the basis of a nomenclature established via an order of the administrative authorities. The costs are evaluated according to a method based on an analysis of the different options that can be reasonably contemplated to perform these operations and, on that basis, to make a prudent choice of a reference strategy.

The discounting rate used to compute the amount of provisions is determined by the operator and must not exceed either the expected rate of return on the hedged assets, managed with a sufficient level of security and liquidity to serve their purpose, or a ceiling determined by decision of the administrative authorities.

Different kinds of assets may be hedged, within a certain percentage, such as bonds, debt or securities issued or guaranteed by a Member State of the European Community or the OECD, or stocks, shares or other equity securities in the capital of companies with headquarters in a Member State of the European Community or the OECD.

Property assets, the instruments and securities that evidence the debt, as well as deposit accounts, must be kept or opened in France. The operator must keep a permanent inventory of the hedged assets and transmit a summary report every quarter to the administrative authorities. The operator's Board of Directors determines the framework for investing in and managing hedged assets based on the purpose of the assets and the principles of precaution and risk diversification.

In addition, the Committee for Monitoring Nuclear Commitments ("CSEN") is responsible for reviewing and issuing an opinion on the framework used for the policy to invest in and manage hedged assets (see section 16.2.3.2).

Finally, a report is filed with the administrative authorities and the NSA every three years, with a copy sent to the Statutory Auditors and includes, in particular, a valuation of the costs, the methods used for the calculation of provisions, and the composition of the assets. The administrative authorities may require any additional supporting documents, have an outside organisation conduct a study, or require an expert valuation of the assets at the operator's expense.

Council Directive 2011/70/Euratom of 19 July 2011 established a Community framework for the responsible and safe management of spent fuel and radioactive waste. This has strengthened the efforts of the Commission to regulate the use of nuclear energy in the European Union after the adoption in 2009 of the Directive on Nuclear Safety. Although the Directive 2011/70/Euratom does not contain any particularly innovative provisions from the point of view of French law, it does constitute a foundation of fundamental rules in the field of managing radioactive waste and spent fuel for a certain number of Member States in the European Union and clarifies several terms which could be potential sources of conflict. This Directive presents deep geological disposal as the safest and most sustainable option to manage long-life, high-level waste and considers the possibility of creating disposal facilities shared between several Member States, on a voluntary basis.

### Regulations on radiation protection

In France, nuclear activities that present a risk of exposure of persons to ionising radiation are regulated by two separate systems, depending on the category of person protected. These systems are taken from Council Directive 96/29/Euratom of 13 May 1996, known as the basic standards directive, which is currently being revised.

Regulations on the basic protection of the population against such radiation, which are governed by the French Public Health Code, are derived mainly through the subordination of all nuclear activities to a declaration or authorisation. Authorisations granted to establish a Basic Nuclear Facility serve as the authorisation required under the French Public Health Code. Article R. 1333-8 of the French Public Health Code sets the maximum exposure level of the general public at 1mSv per year.

French Regulations on the protection of workers against the dangers of ionising radiation, which are governed by the French Labour Code, lay down various obligations for employers of workers who are likely to be exposed and, in particular, set a limit on exposure of workers to ionising radiation at 20mSv over a period of twelve consecutive months.

The French Health Code contains the provisions applicable to controlling high-level sealed radioactive sources and orphan sources.

### Civil liability of nuclear facility operators

Several international conventions govern the civil liability of nuclear facility operators, in particular the Paris Convention of 29 July 1960 on Third-Party Liability in the Field of Nuclear Energy and the Brussels Convention of 31 January 1963, which supplements the Paris Convention. These two Conventions are applicable in the signatory countries that have ratified them, including France and the United Kingdom, countries where the Group operates nuclear facilities (in France, through EDF and in the United Kingdom, through EDF Energy). In accordance with these Conventions, nuclear civil liability in France is governed by Law no. 68-943 of 30 October 1968, as amended, which was integrated into the French Environment Code via Order no. 2012-6 of 5 January 2012).

The Paris Convention established a special liability derogation system, which has the following characteristics:

- damages covered: all damages to persons and property must be remedied;
- type of liability: strict liability, i.e. even in the absence of a fault committed by the operator;
- exemptions: the operator is not liable for damages caused by a nuclear incident if such incident is due directly to acts of armed conflict, hostilities, civil war, insurrection or a natural disaster of an exceptional nature. Acts of terrorism do not constitute an exemption;
- person liable: the principle of channelling liability to a single entity: the operator of the nuclear facility where the nuclear substances that caused the damage are stored or came from;

- limitations of liability: the operator's liability may be limited both in terms of the amount and duration by national legislation, provided this complies with the common minimum liability amount as set under the Conventions:
  - if the facility is in France, the operator's liability is limited to approximately €91.5 million per nuclear incident at a facility and to approximately €22.9 million per nuclear incident during transport. The time limit to file a claim for compensation is 10 years from the date of the incident,
  - over and above the maximum amount for which the operator is liable, the State in which the nuclear facility of the operator liable for the incident is located and where the incident occurred is responsible for compensating victims up to a maximum of €201.4 million (provided that said State is a Contracting State of the Brussels Convention),
  - over and above this amount, Member States that have ratified the Brussels Convention (including France) contribute collectively to compensation up to a ceiling of €345.3 million;
- financial guarantee: the operator has an obligation to contract insurance or lodge financial security up to the liability amounts established in order to guarantee the availability of funds. This insurance or financial security must be approved by the State in which the insured or guaranteed facility is located. EDF has opted for insurance and is in compliance with the current coverage requirements (see section 4.2.3 ("Insurance")).

Protocols amending the Paris Convention and the Brussels Convention were signed on 12 February 2004. They require substantially higher amounts of compensation to be available in order to cover a greater number of victims and types of collateral damage. The operator's liability is accordingly at least €700 million per nuclear incident in a facility and €80 million per nuclear incident during transport. The State in which the nuclear facility of the operator liable for causing the damages is located is liable for amounts above the €700 million for which the operator is liable, up to a maximum amount of €1,200 million (provided that said State is a Contracting State of the Brussels Convention). Above this amount, the Contracting States of the Brussels Convention are liable up to a maximum amount of €1,500 million. In addition, for personal injury only, the time limit to claim compensation has changed from 10 years to 30 years from the date of the incident. Another important change is the introduction of a detailed definition of "nuclear damage", which includes economic loss, the cost of preventive measures, the costs of measures of reinstatement of an impaired environment, and certain other losses resulting from damage to the environment. Finally, the amending Protocols provide that exemptions of an operator's liability are limited to cases of armed conflict, hostilities, civil war or insurrection (natural disasters no longer entitle the operator to an exemption).

These new provisions were transposed into French law in the above-mentioned TSN Law of 13 June 2006. However, these provisions will only be applicable when the protocol that amends the Paris Convention comes into force, i.e. when at least two-thirds of the sixteen Contracting States have ratified them. Moreover, the thirteen Member States of the European Union are required to file their ratification instruments together. As of 31 December 2012, thirteen States, of which ten from the European Union out of sixteen, have transposed the provisions of the Protocols into their national laws and are ready to file their ratification instruments. France has adopted a Law permitting ratification of both Protocols (Law no. 2006-786 of 5 July 2006), but has not yet filed the corresponding ratification instruments.

Even so, at a meeting held 8 February 2012, the French Nuclear Policy Council requested that the Government present a bill to the Council of Ministers for a new law aimed at increasing the ceilings of compensation in the event of an incident, without waiting for the Protocols amending the Paris and Brussels Conventions to come into force. On 21 March 2012, the Prime Minister presented a bill to ratify Order no. 2012-6 of 5 January 2012 that amends the French Environment Code, the French Public Health Code

and the French Defence Code. The order for which ratification is proposed added to the French Environment Code all the provisions on transparency, safety, waste management and civil liability in the field of nuclear activities. As requested by the Nuclear Policy Council, the bill increases the cap on compensation in the event of a nuclear accident from €91.5 to €700 million.

Moreover, on 28 March 2012, the Minister for Foreign and European Affairs presented a bill authorising approval of the joint protocol on the application of the Vienna Convention and the Paris Convention. This joint protocol establishes a link between the Paris Convention, which covers countries in Western Europe, and the Vienna Convention of 21 May 1963 on civil liability for nuclear damage, which covers (among others) countries in Eastern Europe. It enables the parties to one of these two conventions (Paris or Vienna) who adhere to the protocol to benefit from the coverage provided by the other convention. The Senate has officially registered on its agenda the consideration of this bill on 16 April 2013.

### Protection of nuclear facilities and material

The purpose of the regulations on the protection and control of nuclear material governed by Article L 1333-1 of the French Defence Code is to detect and prevent the loss, theft or misappropriation of nuclear material that is stored at facilities or being transported, or any attempts to alter, damage or disperse such material.

These regulations were completely recast by Decree no. 2009-1120 of 17 September 2009 on the protection and control of nuclear material, facilities and transportation, as set forth in the French Defence Code. The main purpose of this decree was to extend the protection of nuclear material to the facilities where it is stored. Several orders published in 2011 detail operators' obligations.

For nuclear power plants, the Order of 10 June 2011 is based on in-depth defence of targets, namely nuclear material, the equipment or functions, which, in the event of default or damage by a malicious act, would be liable to have radiological consequences. Accordingly, the operator must set up several lines of protection in the form of six zones (e.g. access control zones, vital zone, internal zone, etc.).

The Order of 10 June 2011 on the physical protection of facilities that house nuclear material, for which storage requires an authorisation, carries a certain number of obligations for operators, with which compliance is required by 6 July 2016 at the latest.

The Order of 9 June 2011 develops the system for physically monitoring nuclear material, as well as the accounting conditions for nuclear material and operator obligations. Accordingly, operators must ensure that the physical monitoring and accounting are protected against the malicious actions identified when the authorisation is issued.

### 6.5.6.2.3 Regulations applicable to fossil-fuel fired energy generation

The EDF Group's fossil-fired energy generation business is subject in France to the Regulations applicable to ICPEs (see section 6.5.6.2.1 ("Regulations applicable to facilities classified for the protection of the environment ("ICPEs")")). EDF's fossil-fuel fired facilities must also comply with specific regulations on air quality, adopted mainly as a result of European Directive 2001/81/EC of 23 October 2001 on national emission ceilings for certain atmospheric pollutants ("NEC Directive"), and Directive 2001/80/EC of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants (LCP Directive – see section 6.5.8 ("Principal planned regulations that are likely to have an impact on the EDF Group's business")) below for a description of these specific regulations).

Exemptions are possible up until 2015. As of that time, the ceilings and the exemptions originating from the IED Directive mentioned above will apply, with, in particular, specific issues concerning production facilities in

the overseas departments and emergency systems, for which the pollution levels require negotiating adapted provisions.

Fossil-fired energy production is also subject to the provisions of the Seveso 2 and 3 Directives and to the obligation to lodge financial guarantees (see section 6.5.6.2.1 ("Regulations applicable to facilities classified for the protection of the environment ("ICPEs")")). The transposition regulations should be adopted in the current of the year 2013.

### 6.5.6.2.4 Regulations applicable to hydropower facilities

In France, hydropower facilities are subject to the provisions contained in Articles L. 511-1 *et seq.* of the Energy Code. They require a concession agreement granted by the Prime Minister (for facilities generating over 100MW) or by the Prefect (for facilities generating between 4.5MW and 100MW), or an authorisation from the Prefecture (for facilities under 4.5MW), (see section 6.2.1.1.4.4 ("Issues relating to hydropower generation") concerning hydropower concessions).

EDF's hydropower generation business is subject to water regulations. Such regulations cover in particular control over variations in water levels and flow rates, and the safety of areas in the vicinity and downstream of hydropower facilities (see section 6.5.6.1 ("Basic regulations applicable to the environment, health, hygiene and safety"))).

### Conditions applicable to reviewing of bids to renew hydropower concessions

Decree no. 94-894 of 13 October 1994, as amended by Decree no. 2008-1009 of 26 September 2008, specifies the conditions for the awarding or renewal of a hydropower concession. This decree, which at present places concessions within the legal framework for public service delegation contracts, provides for a public bidding procedure for concessions that are about to end. The former preferential right of the outgoing operator was eliminated as it was not compatible with the law derived from Community Treaties.

When a hydropower concession is renewed, an annual concession fee indexed to the revenues generated from sales of electricity produced by the hydropower facilities under concession will be levied, which is paid in part to the French State and in part to the French *départements* and municipalities through which the waterways used flow. The Grenelle 1 Law provided for the possibility of capping the amount of this fee above a 25% threshold. The Grenelle 2 Law provides for a cap to be set by the contracting authority on a case-by-case basis, for each new or renewed concession. To date, the decree has set three criteria for the choice of the future operator: a guarantee of the energy efficiency in the operation of the waterfall, respect for balanced management of water resources and the best economic and financial conditions for the contracting authority. The new procedure to appoint operators will now be for a duration of five years (compared to eleven years previously).

### 6.5.6.2.5 Regulations applicable to renewable energy generation

The "Climate Package" is the source of a set of measures aimed at ensuring that, by 2020, the EU will achieve the objectives of a 20% reduction of greenhouse gas emissions (GHG), a 20% improvement in energy efficiency and a 20% portion of renewable energy in energy consumption.

One of the five instruments that make up the Climate Package is Directive 2009/28/EC of 23 April 2009 on the promotion of the use of energy from renewable sources, known as the "REN Directive". The Directive allocates the effort to reach the 20% EU target of energy from renewable sources by 2020 among Member States, taking into account, among other aspects, the national energy mix, the potential of each State and its GDP, and requires Member States to adopt national renewable energy action plans.



Pursuant to Article 4 of the aforementioned REN Directive, France adopted its National Action Plan in favour of renewable energies (2009-2020). This Plan covers the objectives contained in the Multi-annual Investment Programme ("PPI") and lays down, in accordance with the Grenelle Law, a national objective of renewable energy production at 23% of the gross final consumption of energy by 2020.

In order to achieve this objective, the Grenelle 2 Law created new land planning instruments with a view to enabling balance development between the various renewable energy sectors, which include:

- regional climate, air and energy schemes ("SRCAE"), for which the legal framework is laid down in Articles L. 222-1 to L. 222-3 and R. 222-1 to R. 222-7 of the French Environment Code. Some regions have adopted their SRCAE, while others are still finalising these schemes;
- regional schemes for connection to renewable energy networks ("S3RER"), including Decree no. 2012-533 of 20 April 2012, which specifies the composition, approval rules, host capacity management and financial conditions for the connection of electricity producers.

Under Article 15 of the REN Directive, an Order of 14 September 2011 amended the legal rules on the guarantee of origin of electricity produced using renewable sources or by cogeneration, laid down in Articles L. 314-14 *et seq.* of the French Energy Code. The terms and conditions to implement this new scheme and the rules for appointing the organisation in charge of managing guarantees of origin (issuing, transfer, cancellation) are stipulated in Decree no. 2012-62 of 20 January 2012. As mandatory producer and purchaser of electricity produced using renewable energies (hydroelectricity), the EDF Group is concerned by these provisions.

The Grenelle 2 Law also contains more favourable provisions for sea-based renewable energies:

- exemption from all urban planning procedures for facilities located off shore «on the public maritime domain which are underwater below the low tidemark» if they are listed in a Decree issued following consultation of the Council of State (Article L. 421-5 of the French Urban Planning Code);
- derogation allowing structures to connect marine facilities using renewable energies to public networks to transmit and distribute electricity along coastal areas (Article L. 146-4 of the French Urban Planning Code).

#### 6.5.6.2.6 Regulations specific to the generation of wind power

Pursuant to Articles R. 421-1 and R. 421-2 of the French Urban Planning Code, a building permit must be obtained for land wind farms with a height equal to or greater than 12 metres. The construction of wind farms on the public maritime domain is exempted from the requirement for a building permit, in accordance with Article R. 421-8-1 of the French Urban Planning Code.

In addition, the Grenelle 2 Law provides that land wind power farms are now subject to the nomenclature applicable to ICPEs with the legal system of authorisation or declaration (see section 6.5.6.2.1 ("Regulations applicable to classified facilities for the protection of the environment ("ICPEs")")) under item 2980 "Terrestrial facilities for the generation of electricity using mechanical wind energy with one or several wind-power generators". In connection with the application for a building permit, an impact study must be done for wind power farms subject to authorisation and submitted with the authorisation file. A distance of 500 metres between the facilities and buildings used as housing, inhabited buildings and areas intended for housing is required for the operating authorisation to be issued.

The operator of a wind farm, or in the event of default, the parent company, is responsible for decommissioning the farm and site restoration, as soon as operation is terminated for any reason (Articles L. 553-3 and L. 553-1 of the French Environment Code). For this purpose, the operator is required to lodge financial guarantees as of the start-up of production and for subsequent accounting periods.

### 6.5.7 Regulations on the wholesale energy market

Inspired by the rules contained in Directive 2003/6/EC on market abuse applicable to financial markets (see section 16.5 ("Stock Exchange Ethics Code")), Regulation (EU) No. 1227/2011, known as the "REMIT" Regulation on wholesale energy market integrity and transparency came into force on 28 December 2011. This Regulation is aimed at preventing market abuse and manipulation on wholesale energy markets and strengthening the confidence of market participants and consumers.

Strengthening wholesale energy market integrity and transparency must foster open and fair competition on these markets, in particular so that prices set on these markets reflect a fair and competitive interplay between supply and demand. The Regulation prohibits insider trading and market manipulation and establishes an obligation to publish inside information as defined in the REMIT.

The European Agency for the Cooperation of Energy Regulators (ACER) is responsible for monitoring wholesale trades in energy products, in order to detect and prevent transactions based on inside information and market manipulations.

ACER also collects the data needed to assess and monitor markets, inasmuch as the regulation provides that market participants, or a person empowered to do so on their behalf, must supply ACER with a detailed statement of wholesale energy market transactions.

Lastly, market participants that perform transactions for which a declaration to ACER is mandatory must register with the national regulatory authority of the Member State in which they are established (the CRE in France) or, if they are not established in the European Union, that of a Member State in which they do business.

### 6.5.8 Principal planned regulations that are likely to have an impact on the EDF Group's business

Several planned regulations, both at community level and in France, are being drafted which could have a significant impact on the EDF Group's business. The main regulations concerned are described below.

#### 6.5.8.1 Future regulations at community level

##### Regulations on service concessions

The Proposal for a community directive on the award of works and service concession contracts was adopted by the European Commission on 20 December 2011. The Proposal took the form of a separate legal instrument from the Directives on Public Procurement, but nevertheless refers to a number of the same concepts. Contrary to the assurances given by the Commission, this Proposal goes far beyond a light approach by specifically regulating the conditions for the award and modification of concessions.

The Proposal does not provide for an exemption of those sectors covered under Directives 2009/72/EC and 2009/73/EC. One of the provisions that will be worked on further should allow network concessions to be excluded from the scope of application of the future Directive. On the other hand, the future of concessions supplying utilities at regulated tariffs remains uncertain. The impact on the legal system applicable to hydropower concessions, which is currently governed by the Sapin Act on public service delegation contracts, should be limited, except with regard to the possibilities of upratings under the 2005 Energy Policy Act.

The final vote on the Proposal is scheduled for 2013.



## Environment

### Seventh Environment Action Programme ("EAP")

Following the expiration of the Sixth Environment Action Programme in July 2012, on 29 November 2012 the European Commission published its proposal for the Seventh Programme. This is designed to guide European Union policy until 2020. In this Programme, the Commission defines nine priority objectives, including: protecting nature and improving ecological resilience, stimulating sustainable growth, effectiveness in the use of resources and low carbon emissions, and effective response to health threats that are linked to the environment.

This proposal will be examined by the European Parliament and the Council of the European Union in the coming months. Once approved, the new EAP will be incorporated into EU legislation.

### Soil quality

As part of its proposal for the Seventh EAP, the European Commission expressed the desire to deal with soil quality problems within a strict legal framework. The proposed directive that defines a framework for the protection of soil, which was adopted by the European Parliament in 2007 and rejected by the Council, could be reviewed again.

### Environmental evaluation

On 26 October 2012 the European Commission presented a proposed directive to amend the directive on impact studies (Directive 85/337/EC of 27 June 1985, as amended by Directive 2011/92/EU of 13 December 2011, published in the OJ on 28 January 2012). The amendments made are liable to impact the authorisation procedures that are applicable to EDF Group projects.

### Use of resources

As part of its proposal for the Seventh EAP, the European Commission confirmed its roadmap to a resource efficient Europe which was published in September 2011. Its objective is to make the European Union an economy that is efficient in the use of resources, green, competitive and with low carbon emissions.

### Nuclear

On 29 September 2011, the European Commission presented a Proposal for a Euratom Directive laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation. This proposed Directive is for the purpose of replacing and updating existing directives by taking into account International standards developed over the last few years by experts from the International Commission on Radiological Protection and the International Atomic Energy Agency.

## 6.5.8.2 Future regulations at national level

### Decrees to implement the Grenelle 2 Law

Implementation of the Grenelle 2 Law requires that a significant number of implementing decrees be published: at 31 December 2012, 86% had been published<sup>1</sup>.

Throughout the course of 2013, the decrees to be published include:

- a draft decree on information regarding the risk of soil pollution (see section 6.5.6.1 ("Basic regulations applicable to the environment, health, hygiene and safety"));
- a draft decree on the protection of biotopes, natural habitats and geological interest sites, which will set the conditions for applying Article 124 of Law no. 2010-788 of 12 July 2010 on the national commitment to the environment;
- a draft decree on the approval of national policies for the preservation and rehabilitation of ecological continuities.

### Facilities classified for the protection of the environment

As the IED Directive has only been partially transposed in France (see section 6.5.6.2.1 ("Regulations applicable to facilities classified for the protection of the environment ("ICPEs")")), a new order will be issued to complete the transposition of the Directive into French law and in particular, as regards provisions applicable to LCPs.

### PCBs

A plan to reform the Regulations on PCBs (see section 6.5.6.1 ("Basic regulations applicable to the environment, health, hygiene and safety")) is pending. New time limits to eliminate and decontaminate equipment containing fluid with over 50ppm of PCB will be set and the legal system applicable to holding this type of equipment will be aligned by deleting item 1180 from the ICPE nomenclature to which holders of equipment with a capacity of over 30 litres were previously subject.

### Health and the environment

A bill on the independence of expertise in the field of health and the environment and the protection of whistleblowers is being debated in Parliament.

The bill adopted on 21 November 2012 by the Senate and on 31 January 2013 by the National Assembly provides for, among other things, the creation of a National Commission on Ethics and Whistleblowing for health and the environment and the recognition of a Whistleblowing mechanism. The bill will now receive a second reading in each house.

### Environmental conference

During the "Environmental Conference" held on 14 and 15 September 2012, the French government announced a series of measures that are liable to have a major impact on the EDF Group's activities, including the launch of a large-scale national debate on energy and ecological transition, which will lead to the adoption of a new law during the first half of 2013, the adoption of a new framework law on "biodiversity" and a reform of environmental tax.

### Fessenheim

In September 2012, public authorities announced the closure of the nuclear power plant of Fessenheim at the end 2016. This closure should be accompanied by a full compensation of the damage it causes to the Company.

1. Fourth annual report on the implementation commitment to the environment Grenelle (2012).

## 6.6 Corporate responsibility

This section includes information that the EDF Group is required to publish in accordance with the Article L. 225-102-1 of the Commercial Code and the Decree of 24 April 2012 implementing the *Grenelle 2* law, which require companies to disclose how they take into account the social and environmental consequences of their activities and social commitments in favor of sustainable development.

Social information are presented in Chapter 17 ("Employees - Human Resources").

Environmental and social information presented in section 6.6 ("Corporate responsibility") are complemented by sustainable development indicators presented in Appendix E of this document, as well as the assurance report of the Statutory Auditors on indicators.

### 6.6.1 Sustainable development

With its core values of respect, responsibility and solidarity for excellence underpinned by integrity, EDF group has applied a strategy that focuses on the public interest and is founded on a corporate responsibility approach.

This is reflected in EDF's constant concern for the safety of people and the security of its industrial facilities, while contributing to secure supplies of quality electricity at a competitive price in each country where the Group does business.

The EDF group's policies are part of this corporate responsibility approach:

- the Group strategy to 2020, as presented at the 2011 General Shareholders' Meeting
- the Group-level sustainable development policy signed by all Group companies in 2009, itself comprising environmental, societal and governance policies
- a global approach to Human Resources and social matters called "Vision RH", consisting of group policies on diversity, career equality, accessibility, etc through a worldwide Corporate Social Responsibility agreement signed with the union organisations of 16 Group companies
- a Group charter of ethics, currently being rolled out to replace EDF's Ethics Guide introduced in 2007.

The EDF group's environmental and societal policy draws on the principles of the United Nations Global Compact, which the Group joined in 2001. The Group has formally defined its action in a sustainable development policy that addresses the relevant key issues, guided by EDF's ethical approach. This is reflected in an environmental policy focusing on climate change prevention and protection of biodiversity, and a societal policy promoting access to energy, local responsibility and contributions to education on energy issues.

#### 6.6.1.1 Governance of sustainable development

Governance of sustainable development takes place through the following organisations, systems and monitoring bodies:

- a Sustainable Development Department, whose task is to coordinate and support actions by EDF departments and Group companies to meet its commitments under the sustainable development policy, and report on those actions. The sustainable development department has defined four major areas for action: dialogue with stakeholders, the inclusive green economy (financing the economic model and integrating sustainable development aspects into all lines of activity), sustainable development in projects and management of sustainable development (led by the Group);

- an environmental management system ("EMS") that is used in all entities (see section 6.6.2.1.1 ("Organisation and ISO 14001 certification"));
- a Group Sustainable Development Committee formed in late 2008, made up of the heads of sustainable development from the principal Group subsidiaries, affiliates and divisions. While respecting the independence of each Group entity, the Committee's task is to supervise implementation of the Group's sustainable development policy and coordinate actions associated with the Group's ISO 14001 certification, as well as to develop sharing of experiences and best practices between its entities. This Committee held three meetings in 2012 to monitor progress on the charter of ethics at Group level, examine the conditions for stronger dialogue between Group companies and their stakeholders, assess the acceptability of these entities' industrial facilities, study the relevance of the Group's current sustainable development policy in the light of new worldwide environmental and societal situations, initiate reflection on the introduction of common corporate social responsibility commitments for all Group subsidiaries, affiliates and divisions, and discuss the issues raised by a biomass policy;
- project screening through the COMEX's Commitments Committee. Before being submitted to this committee, the Group's major investment projects undergo an assessment of their exposure to the risk of "non-achievement of sustainable development commitments".

#### 6.6.1.2 Training in sustainable development for managers and employees

EDF has embarked on a programme to raise managers' and employees' awareness and consideration of sustainable development issues, via:

- a system to incorporate sustainable development issues into project management. Since April 2012 the project management standards has been updated, to incorporate the sustainable development dimension and investment monitoring more comprehensively. All aspects of sustainable development and economic performance are now covered: analysis of the project's economic lifecycle, contribution to local economic development, investment monitoring, inclusion of social clauses in procurement contracts, compliance with regulatory consultation measures, etc. The updated standards were prepared in conjunction with the companies and divisions, and will be rolled out to the whole Group in 2013;
- this is backed up by a system to help local diagnosis, appropriate training sessions, and mapping of the stakeholders and the Durabilis methodology, all to help managers develop action plans for sustainable development, and encourage them to identify the stakeholders concerned by their project, the project's consequences for local employment, value creation in the local area, secure working conditions, reasonable use of local resources, biodiversity impacts. Tested for the whole Group (EDF Energy, EDF Énergies Nouvelles) in 2011, the Durabilis methodology was rolled out in 2012 by EDF's business line management divisions as part of the "improving project success" programme;
- a project management community is currently being created to lead a network of project managers;
- introduction of a compulsory 2-day training module in "Customer Division fundamentals" for everyone joining EDF; this module covers the new regulatory environments, the issues of energy efficiency and the dangers of electricity as a product;
- a "Core knowledge" academy which provides training for all new arrivals at the Nuclear fleet division in ISO 14001 certification, industrial and nuclear waste management and ethics;

- specific Academies for the generation business lines, including environmental modules (e.g. amoebae and legionella, and environmental regulations for engineers);
- theme days (the Societal Workshop in January 2012 that gave 80 project managers better awareness of the importance of taking stakeholder expectations into consideration; Eco-design day for engineering sustainable development delegates, for stronger incorporation of eco-design into industrial projects);
- publication of methodological guides on attention to biodiversity in operational business lines (hydropower and property management in 2011, nuclear power and networks in 2012);
- introduction, over the last three years, of a "Responsible purchasing" component in the training of purchasers followed by all new arrivals concerned (1,435 hours of training given in 2012), and introduction of a specific 2-day course on "Purchasing and sustainable development" (1,000 hours of training given since 2010);
- organisation of "Sustainable City" conferences where the teams in charge of strategy, relations with local authorities, research and sustainable development can share the experiences of town planners, architects, local development and planning agencies, mayors, ministerial experts and research institutes. Four conferences took place in 2012, focusing on initiatives taken by the Swedish city of Malmö, social diversity in towns and cities, urban change and urban biodiversity;
- the launch in May 2012 of a "Sustainable Development community" on EDF's intranet site, to encourage sharing of good practices instigated by the business line divisions and make employees more aware of changes in their environment (40,000 pages have been visited);
- the "Wattitude" system offering EDF employees products and services at special rates to reduce their energy consumption and carbon footprint, and an associated campaign to educate users and promote environmentally responsible behaviour in everyday life;
- inclusion of sustainable development criteria in calculation of employee profit share. This concerns two of the total five criteria: the recycling rate for waste managed by EDF, and the proportion of employees who followed at least one training course during the year. 40% of employee profit share is linked to achievement of these objectives.

Training for nuclear service providers also includes an "Environment" module.

In 2012, EDF and ERDF focused on raising employee awareness of reducing industrial waste, by launching an inter-business line competition named "*ça déborde, à vous de jouer*". The objective is to identify innovative practices that generate less waste at source, and share them with a view to industrial application. This operation is one of the 35 corporate initiatives to gain official recognition by the French environment and energy management agency ADEME as part of the 4<sup>th</sup> European Waste Reduction week (17 to 25 November 2012). More than 130 teams submitted initiatives on four themes: reducing the quantity of waste, reducing its danger level, optimising site waste management and reducing office waste. The competition was accompanied by a multi-business line day dedicated to prevention and optimisation of non-nuclear waste.

In the United Kingdom, all EDF Energy employees now follow a compulsory e-learning course called Sustainable Steps, which presents the company's sustainable development commitments. More than 6,400 employees (41% of the workforce) have already followed this course. In the "Coaching for performance" career plan, each person must define an action associated with sustainable development, and each action is subject to managerial monitoring. In 2012, 76% of employees drew up an action. The management training initiated in 2011 to foster inclusion of sustainable development in decision-making criteria and assessment of the opportunities offered by sustainable development in their business model has now been extended to employees in charge of programmes related to corporate responsibility. This

training continued with the University of Cambridge (73 managers trained in 2012). Finally, EDF Energy has set up a Company Incentive Plan (CIP) that includes profit share criteria based on the degree to which economic, environmental and social performance commitments are kept.

## 6.6.2 Environmental information

### 6.6.2.1 General environmental policy

#### 6.6.2.1.1 Organisation and ISO 14001 certification

The Group's entities use an environmental management system (EMS). Initiatives, objectives and indicators are coordinated through the system at Group level according to the environmental commitments in the Group's development policy, overseen by a Supervisory Board and groups focusing on specific themes.

In 2011 the Afnor issued its third 3-year renewal for the Group's ISO 14001 certification, originally gained in 2002.

Some ISO 14001 certified Group companies are aiming to join this Group certificate in 2013.

In 2012, EDF and its subsidiaries and affiliates representing 98% of consolidated sales had ISO 14001 certification.

In France, as part of the operation of its EMS, EDF has structured its approach in an environmental management programme ("EMP").

The programme, which was validated when the SME was reviewed by the environmental Supervisory Board on 21 March 2012, aims to consolidate the environmental initiatives in order to achieve the targets set in EDF's sustainable development policy.

The most significant actions are the following:

- continuing to reduce the Group's CO<sub>2</sub> emissions by improving nuclear fleet availability and adjusting the energy mix (developing renewable energies and commissioning new generation units, particularly combined cycle gas units);
- limiting environmental impacts, especially on biodiversity;
- improving management and recycling of non-nuclear waste;
- screening sustainable development criteria for investment, development and maintenance projects for industrial installations;
- maintaining the good level of employment and management awareness;
- demonstrating continuous improvement and performance;
- giving greater recognition to employees' efforts to achieve targets;
- improving organisation further, ensuring that activities are in compliance with regulations.

At international level, at the annual review of the EMS on 29 June 2012, the members of the Sustainable Development Committee defined the following major orientations:

- ongoing introduction of action plans for adjustment to climate change, as decided by each entity;
- continued integration of certified companies into the Group's ISO 14001 certificate;
- implementation of Group commitments regarding water (see section 6.6.2.4.2 ("Management of water resources"))
- sharing the methodological components of a Group carbon footprint (assessment of greenhouse gas emissions).

#### 6.6.2.1.2 Oversight of environmental risks

Risk mapping and risk control levels, including EDF's environmental risks, are prepared by the Group's Risk Control Division, in relation with all Group subsidiaries and entities.

Financially and economically, the most significant factors associated with environmental risks relate to:

- deployment of energy efficiency actions and achieving the associated certificates;
- impacts of EDF businesses on the air, water and ground quality and waste production;
- protection of biodiversity;
- management of water resources;
- greenhouse gas emissions.

These risks are fully integrated into EDF's environmental management system and are covered by action plans resulting from the orientations laid down in the Group's Sustainable Development policy.

#### Resources devoted to preventing risk and pollution

To control the risks of industrial accidents with potential consequences for the natural environment and/or public health, EDF carries out:

- inspections and audits of generation sites (see section 6.6.2.2.1 ("Nuclear safety") and 6.6.2.2.2 ("Hydropower safety"));
- crisis drill exercises; In 2012, 195 exercises (including 12 national drills together with the French authorities) took place at 19 of the French nuclear power plants;
- an active investment policy;
- a personnel training programme to raise awareness of all parties involved.

There were no major significant environmental events<sup>1</sup> in 2012.

#### 6.6.2.1.3 Environmental incidents

Each operational unit and company in the Group identifies potential events with environmental impacts, manages the emergencies that may result and carries out the corresponding crisis drill exercises, with its own monitoring system and reporting on the environmental events under its responsibility.

Such events are of minor importance and generally relate to operating problems such as low-volume, localised hydrocarbon spills, dust emissions in the air, legacy ground pollution, and changes in water flow downstream of hydropower facilities.

Each event is analyzed individually, and the necessary corrective action to prevent recurrence is defined based on an overall review using the ISO 14001 certified management system.

#### 6.6.2.1.4 Environmental research and development

With its forward-looking action for the medium and long term, EDF's R&D is preparing for the Group's future by responding to the environmental issues it faces. (see chapter 11 ("Research and development, patent and licenses")).

Its research areas focus on three major priorities :

- consolidation of a carbon-free energy mix;

- development of a flexible demand for low-carbon energy;
- adaptation of the electricity system to meet new challenges.

The main areas for sustainable development-themed research in 2012 are:

- controlling the nuclear facilities' impact on the environment: i) intensifying research on safety, the environment (external events) and operating lifetime, ii) new topics such as rehabilitation of an inhabited area evacuated after a nuclear incident;
- improving the competitiveness and availability of nuclear power plants, with the objective of generating the same amount of electricity for lower fuel consumption. Innovative instruments were developed during 2012 to identify energy losses and performance in the plants' major circuits, and to assess the additional power margins that could be achieved without compromising safety;
- reinforcing investments in new test resources to support energy efficient offers, with two new laboratories opened in 2012 of (one to work on Low Energy Buildings and the other on new lighting techniques);
- participation in five Institute of Excellence carbon-free energy projects under the investments for the future project: i) the Institut Photovoltaïque Île-de-France ("IPVF"), which focuses on technological innovation to bring competitive photovoltaic energy on the market, ii) France Energies Marines, working on marine and offshore wind power, iii) SuperGrid on the theme of major transmission networks connecting remote renewable energy generation sites, iv) Efficacy, on the sustainable city, and v) Vedecom, on electric mobility.

EDF is also the main investor of Electranova Capital, capital fund for innovative young companies in the energy sector, launched in May 2012 with support from Allianz and in partnership with Idinvest Partners. Endowed with a minimum investment capacity of €60 million, the fund will finance innovative young companies in the energy sector in order to rise to the challenge of a low-carbon energy model. Electranova Capital made its first two investments in 2012.

### 6.6.2.2 Safety of industrial facilities, and personal safety for employees and third parties

#### 6.6.2.2.1 Nuclear safety

Plant safety during operation is the top priority for the EDF group. It is taken into consideration from the initial design stage, and is regularly monitored, together with implementation of an employee motivation policy and large-scale investment programmes.

In 2012, EDF published its nuclear safety measures and commitments in a single document containing the Group's nuclear safety policy. This has been incorporated into training applicable to EDF personnel and subcontractors.

#### Control and surveillance

Nuclear safety is subject to several controls both internal (annual reviews, internal control plans and nuclear inspections in France) and external (peer reviews between WANO<sup>2</sup> member firms and OSART<sup>3</sup> audits conducted by experts from the IAEA<sup>4</sup>) (see section 6.2.1.1.3.3 ("Environment, safety and radiation protection")).

1. Such events are: accidents and incidents with serious consequences for the environment (impact on human health and/or biodiversity and/or natural resources) or consequences for the Group: legal or financial (reparation for damage, settlement of litigation) or damage to its reputation.

2. World Association of Nuclear Operators.

3. Operational Safety Review Team.

4. International Atomic Energy Agency.



In France, the safety of nuclear facilities is verified by the Nuclear Safety Authority (ASN). The International Nuclear Event Scale (INES) classifies events on a scale of 1 to 7, with 7 being the most serious. Incidents of no consequence for nuclear safety are classified as “deviations” or level 0 events (see section 6.2.1.1.3.3 (“Environment, safety and radiation protection”)).

The ASN also approved the creation of an additional FARN (*Force d’Action Rapide du Nucléaire* or Nuclear Rapid Action Force) crisis management unit, after additional safety assessments carried out by EDF.

In 2012, four operational FARN teams were in existence (Civau, Paluel, Dampierre and Bugey) and simulation exercises were conducted (restoring water, air and electricity supplies).

To ensure the nuclear fleet remains effective and safe after 40 years of operation, EDF is implementing the Major Refit programme involving replacement of major components on nuclear installations. A key aim of this programme is to improve safety performances, as required for the ASN and the State to receive permission to continue operation.

In the United Kingdom, the Office for Civil Nuclear Security (“OCNS”) is the independent watchdog authority for safety in the civil nuclear sector. It monitors compliance with security rules, including for transportation of radioactive matter

In the United States, the Nuclear Regulatory Commission (“NRC”) oversees the quality and safety of the nuclear fleet’s operations. The Institute of Nuclear Power Operations (INPO), of which all US nuclear operators are members, conducts evaluations and analyses with the aim of achieving excellence in operation.

### Results for 2012

There was no serious safety event or above-limit discharge in 2012.

The number of significant safety events declared in France to the Nuclear Safety Authority in 2012 (11.9 per reactor) rose noticeably (+16%) compared to 2011, as did the number of events classified as INES level 1 (1.55 per reactor). Transparency at EDF is good, and this rise, which was mainly due to an increase in events of the kind that arise in general maintenance activities (+40%), requires in-depth analysis and immediate corrective action. Also to be noted is the declaration of one INES level 2 significant safety event with no immediate safety consequences: nonconformities were detected in early 2012 that had affected the “siphon breakers” of certain fuel storage pools from the outset. The number of automatic reactor trips (ARTs) is encouraging, being comparable at 0.55 to 2011 when the fleet registered its best ever performance. This confirms the progress made in previous years and the attainment of the best international standards. In 2012, 36 reactors had no ART all year. The consolidation in 2012 of achievements in fire safety measures (prevention, organisation, training) was another key achievement. Few fires started and there was no major fire incident.

At EDF Energy, in the UK where differences in declaration procedures reflect different reporting requirements, the number of significant safety events was down slightly in 2012 (4.6 per reactor after 4.7 in 2011). More comparable is the number of events classified under the INES: the number of events declared, all limited to level 1 in 2012, was lower than in 2011 and than in the French fleet (0.80 per reactor).

In the United States, which also has different declaration procedures, the number of significant safety events declared in 2012 by CENG remained stable at close to 11 per unit. The number of events classified under the INES rose slightly (0.8 per reactor after 0.6 in 2011), and all were limited to level 1 in 2012.

Detailed results on nuclear safety for 2012 are published in the annual report drawn up by the Inspector of Nuclear Safety, available from EDF’s sustainable development report website (<http://rapport-dd.edf.com>, to be released in April 2013).

### 6.6.2.2 Hydropower safety

In France, EDF operates 435 hydropower plants and manages the water reservoirs held by its 239 large dams. The average age of French hydropower facilities is 69 years. Hydropower safety measures are designed to control risks of breaches in dams or related facilities, the risks associated with operating during high water level periods, and the risks related to water flow variability during operation.

Safety at EDF’s hydropower fleet remained satisfactory in 2012 despite three important hydropower safety incidents classified as “orange” that resulted in penstock pipes or turbine shroud breaking, confirming the need to continue efforts at all levels:

- good detection of significant (non-serious) events (level 0) by local teams (2,950 detected in 2012, 2,472 in 2011);
- the number of events with external effects (level > 1) was substantially lower (39 in 2012, 32 in 2010 and 34 in 2009 after a total of 22 in 2011 when water levels were low);
- the number of sites with a risk of “high criticality” as regards variations in water flow downstream of installations continued to decline: it has fallen from 114 in 2005 to 16 in 2012 (19 in 2011).

Control of risks associated with wear and tear is a major concern in hydropower, and the long-term maintenance policy was updated in 2012.

The long-term “SuPerHydro” hydropower facility renovation programme for fleet safety and efficiency is 73% complete. This programme involves €888 million of expenditure on safety between 2007 and 2017, covering 446 operations, including 367 directly concerning safety. 269 safety operations had been carried out by 31 December 2012.

The recurring maintenance programme “IPHE-S”, covering the safety aspects of hydropower engineering for plants in operation, provides a long-term complement to Superhydro. Immediate maintenance action (specific measures and resources) was taken through this programme to ensure that the safety margins are clearly identified and countermeasures are active. At the end of 2012, 664 specific actions were in process and monitored in 5 priority groups of facilities: galleries, pipes, dams, penstocks and floodgates.

Both these programmes are backed up by the “RenouvEau” programme to improve the safety, performance and competitiveness of the hydropower fleet. The solutions developed aim to generate more hydropower at the optimum time, reduce fleet unavailability and raise profitability while guaranteeing operational and workplace safety. This programme will be rolled out in 2013, after last year’s test phase on pilot sites.

Owners or operators of dams are required by law to carry out safety reviews and danger assessments, and EDF expects to complete 242 danger assessments by 2014 and 152 safety reviews by 2017. By the end of 2012, 67 safety reviews and 175 danger assessments had been carried out, as required by the decree of 11 December 2007, covering all class A facilities (dams at least 20m high, i.e. 149 EDF dams).

For further details, see the 2012 report by the Inspector of Hydropower Safety, available from EDF’s sustainable development report website (<http://rapport-dd.edf.com>, to be released in April 2013).

## 6.6.2.3 Waste policy and management

### 6.6.2.3.1 Nuclear waste

In France, radioactive waste is classified by activity level and lifetime, following the classification used by the French national agency for radioactive waste management ANDRA (Agence nationale pour la gestion des déchets radioactifs). Waste is listed in an inventory stating its location, and the data are published and regularly updated by ANDRA.

Results for EDF in France	Unit	2012	2011	2010
Very low-level radioactive waste from decommissioning	t	2,528	634	1,369
Low and medium-level short-life solid radioactive waste	m <sup>3</sup> /TWh	20.7	15.6	12.4
High and medium-level long-life solid radioactive waste	m <sup>3</sup> /TWh	0.88	0.87	0.88
Transported spent nuclear fuel	t	1,075	1,199	1,140

EDF applies a strategy of gradually increasing the performance of nuclear fuel. The objective is to raise nuclear energy output by increasing the combustion rate and optimising operating cycles to improve nuclear plant availability, while allowing for shutdown schedules in line with seasonal variance in demand.

EDF's current strategy for the nuclear fuel cycle, in agreement with the French state, is to process spent fuel and recycle the plutonium separated in this process in the form of MOX fuel. Since 2010, the recycling capacities have processed close to 1,050 tonnes of spent fuel annually, of a total of some 1,200 tonnes of fuel used per year.

EDF's research programmes on nuclear waste also cover:

- classification of nuclear waste, reprocessing where relevant, conditioning into packages, and its subsequent long-term behaviour in storage;
- thermal-hydro-mechanical and chemical behaviour of geological storage for long-life medium and high-level waste, and the long-term safety of such facilities;
- development of a long-term view in keeping with the prospects for developing 4th generation reactors.

In 2012, EDF's R&D joined forces with other European nuclear actors to form the association Nugenia, an international non-profit association whose objective is to become the single framework for R&D cooperation in Europe for Generation II and III nuclear plants. The association has 60 members from 18 countries. EDF is the president of this association, formed to facilitate synergies and joint projects with national R&D programmes in the following areas: safety and risk analysis, serious accidents, reactor cores and performances, component integrity and ageing, fuels, waste and decommissioning, the Generation III design innovator, and more general issues of harmonising practices (principally in the field of safety) and non-destructive inspections and evaluations.

Four industrial principles govern management of this waste: limiting quantities, sorting by nature, stable conditioning, isolation from humans and the environment. Limited quantities of radioactive waste are produced: 1 MWh of nuclear electricity (equivalent to a month's consumption for 2 households) generates around 11g of radioactive waste, 90% of which is short-life waste.

The cost of removing and storing waste resulting from plant decommissioning is covered by a provision, and the charges related to operating waste are included in annual expenses.

EDF's provisions at 31 December 2012 are established in compliance with the law of 28 June 2006 and its implementing decrees, which were issued in 2007.

At 31 December 2012, provisions for decommissioning and last cores amounted to €20,979 million, and provisions for the back-end nuclear cycle totalled €19,525 million. The price per KWh thus includes all expenses related to this obligation, i.e. the cost of managing long-life waste and the cost of plant decommissioning and current waste conditioning.

EDF's R&D teams and ANDRA are continuing to work together on the question of how packages of nuclear waste behave in geological storage, and on models simulating the behaviour of the host rock, particularly argillite.

As its UK facilities mostly use graphite-gas technology (AGR – advanced gas-cooled reactors), EDF is part of the European Carbawaste project on management of the graphite resulting from decommissioning, alongside German research bodies (FZJ), the CEA, Manchester University and ANDRA. This 4-year project starts in 2013.

In the United Kingdom, radioactive waste is classified as high, medium and low level (HL, ML and LL) and each type is treated differently. Medium level waste is stored on the plants' sites in dedicated facilities, and inspected in compliance with safety requirements.

Low level waste is stored on the plants' sites until prepared for dispatch (for processing or elimination), and is monitored and regularly inspected.

Results for EDF Energy	Unit	2012	2011	2010
Evacuated uranium	t	216	211	131
Evacuated low level radioactive waste	m <sup>3</sup>	698	608	498
Medium level radioactive waste generated	m <sup>3</sup>	161	161	162

In the United States, the Federal Government has banned reprocessing of spent nuclear fuel, and the Nuclear Waste Policy Act (NWPA) enacted in 1982 requires CENG to construct permanent storage facilities for spent

fuel and high level radioactive waste, through the intermediary of the Department of Energy (DOE).

Results for Constellation Energy Nuclear Group (CENG)	Unit	2012	2011	2010
Delivered nuclear fuel	t	46	48	34
Evacuated low and medium level solid radioactive waste	m <sup>3</sup>	2,419	1,287	735

### 6.6.2.3.2 Management of radioactive effluents

In France, management of the nuclear power plants' radioactive gas and liquid effluents is governed by strict regulations and EDF's ambition to limit the environmental and health impacts of its installations (reaffirmed in the Group's environmental policy). In terms of radioactive emissions, plant performance depends not only on the efficiency of effluent processing systems, but also on operating practices.

The action taken in plant design and operation has kept the nuclear plants' radionuclide discharge in liquid form (other than tritium and carbon-14) to a very low "minimum" level for several years, after reducing them by a factor of 100 in 15 years. This achievement results from the efforts made regarding capture, sorting and orientation of effluents at source, increasing evaporation treatments, implementing demineralisation processes and optimising recycling of effluents. Cutting discharge has not caused an increase in waste, because waste also declined over the same period. The same applies for tritium, carbon-14 and other chemical substances.

Measurements taken by the operator are monitored to confirm that the environment is not affected by the installations' operation.

Sampling and measurement campaigns carried out by external laboratories and universities for radio-ecological and hydro-biological monitoring have confirmed the lack of impact in the long term.

In the United Kingdom, radioactive effluents remained stable and within regulatory limits.

The result of atmospheric emissions and radioactive discharge is reported for EDF, EDF Energy et CENG in the summary of environmental indicators reported in appendix E.

### 6.6.2.3.3 Industrial waste

In its sustainable development policy, the EDF group takes proactive measures to limit the environmental and health impacts of its installations and businesses. With its ISO 14001 certified environmental management system, industrial waste is managed with the emphasis on reducing waste at source, sorting waste, recycling and upstream use of products designed and produced in environmentally-friendly ways. A permanent progress approach is applied, founded on the conviction that the "best waste" is waste that is never produced.

Results for the EDF group (in tonnes)	2012	2011
Volume of non-nuclear waste recycled or evacuated for recycling	253,412	251,908

In France, waste management organisation plans are now drawn up before every important construction, decommissioning or maintenance project, and yearly feedback is monitored by the business line divisions. Of the 16 major projects identified in 2012 for the nuclear fleet, 10 are already covered by a plan of this kind and 100% of nuclear engineering projects use them.

When reassessed in March 2012, EDF's sustainable development policy strengthened the target of recycling all suitable waste, raising it from 75% in 2011 to 85% in 2012.

For 2009, 2010, 2011 and 2012 the actual recycling rate for all non-nuclear waste produced by generation and engineering work (excluding fly ash and gypsum, which are fully recycled) was 73.6%, 79.6%, 85.1% and 86.8% respectively.

In the overseas French territories, where recycling of certain types of waste is hindered by isolation and the lack of local facilities, an 84.5% recycling rate was achieved. For Saint-Pierre and Miquelon, 2012 saw completion of a waste elimination system (under the Veolia Canada contract).

The waste management group associated with the EMS, which includes ERDF, held a second multi-business line day on industrial waste prevention and optimisation, preceded by a competition to encourage local initiatives, share good practices and develop synergies between business lines and purchasing. One major example of the practical achievements of 2012 is the centrifuge system linked to a balance tank to clear fuel reservoirs (which reduces fuel losses without having to process and remove hydrocarbonated

water), installed at the Dirinon fossil-fired plant. This will be assessed with a view to more extensive industrial use.

Internationally, EDF Energy made a commitment this year to cut waste by 30% and stop sending office waste to refuse collection sites by 2020. Work on identifying alternative solutions has also begun. "Waste plans" devised at the industrial sites succeeded in reducing the proportion of waste sent each month to underground disposal sites (below 10%).

In Poland, EDF Wybrzeze set up ash silos, which have enabled the company to sell its fly ash and limit the volumes transferred to disposal sites.

### 6.6.2.4 Sustainable management of resources

The Group has several levers to reduce its consumption of natural resources:

- Increasing plant efficiency and limiting loss during generation, transmission and distribution by using the most effective technologies. For example:
  - replacing old fossil-fired plants by the latest-generation coal-fired (supercritical) plants or combined-cycle gas plants,
  - developing cogeneration, i.e. combined generation of heat and electricity;

- using more effective fossil fuels (coal, fuel oil, gas) and fissile fuel (uranium);
- increasing the efficiency of uranium by recycling (of plutonium as MOx fuel), and raising the capacity of certain “breeder reactors” to generate more fissile matter than they consume;
- developing renewable energies: hydropower, pumped storage power stations (STEP), onshore and offshore wind power, solar power (particularly photovoltaic), biomass, and marine energy (marine turbines and tide power) (see section 6.2.1.1.4.1 (“EDF’s fleet of hydropower generation facilities”)).

As all types of energy-saving campaigns are another source of resource protection, EDF develops and markets packages for its customers that incorporate energy-efficient equipment, use of renewable energies in buildings, and incentives for energy-saving behaviour.

These offerings are founded on:

- demand side management (DSM) services: insulation, building renovation, advice and heat diagnoses;
- development and intensive integration of new distributed energies into buildings for heat generation (heat pumps, solar water-heaters, woodburning stoves and fireplaces);
- management of the load curve to reduce or defer peakload CO<sub>2</sub>-producing consumption;
- use of smart meters, to optimize networks and carry out remote measurement services and remote actions to reduce greenhouse gas emissions;
- “green” energy options offered to customers, producing no CO<sub>2</sub> emissions, or partly carbon-offset offers.

#### 6.6.2.4.1 Development of renewable energies

In a world where the development of renewable energies is highly dependent on national and international policies supporting these energy sources (purchase obligations or quotas, favourable electricity purchase tariffs, tax incentives, green certificate systems, etc), the EDF group is continuing to

make significant investments, giving priority for hydropower, wind power and solar power, with support from EDF Énergies Nouvelles and its large European subsidiaries including EDF Energy and Edison. In 2012, Edison devoted 50% of its electricity generation investments to developing new onshore wind farms. In Belgium, EDF Luminus has set itself the target of doubling its installed capacity in onshore wind farms by the end of 2014, and having 10% of renewable energies in its energy mix by 2020.

For EDF Énergies Nouvelles, the year 2012 was marked by five major events:

- in France, successful developments in offshore wind power: three of the French government’s four wind power projects were awarded to the consortium headed by the company in the first tenders for offshore wind power launched in 2011. These three projects will provide a total of 1.5GW in new capacities, and are associated with an ambitious industrial plan to create more than 7,000 jobs directly and indirectly;
- business expansion in three new countries, South Africa, Morocco and Poland. In South Africa, EDF Énergies Nouvelles and its local partners were the successful bidders for three wind power projects (totalling 104MW) in the Cape region. Construction will start in 2013, with commissioning by the end of 2014. In Morocco, the consortium headed by EDF Énergies Nouvelles, in partnership with the Japanese group Mitsui & Co, was the selected bidder for the Taza wind power project (150MW) near the city of Fez. In December, the same consortium was shortlisted for a second Moroccan wind power project (85MW). In Poland, the development company Starke Wind and the Linowo wind farm project were acquired in September 2012;
- a wind power project for more than 1GW was launched in Canada with commissioning of the Saint-Robert Bellarmin plant in October. This programme covers six other projects in a schedule that runs till 2015;
- in France, 3 major solar power projects with total installed power of 231MWc were commissioned in 2012;
- in December, through an international consortium, 32 French existing wind farms at Inberdrola were acquired: these facilities have total installed power of 321MW or close to 5% of France’s connected wind power plants.

## Main developments in 2012

Hydropower	<ul style="list-style-type: none"> <li>■ The reservoir was filled at the Rizzanese dam (55MW) in Corsica, for commissioning of the plant in 2013.</li> <li>■ Preparation of the hydroelectric development project at Romanche Gavet (93MW), Isère, France.</li> <li>■ Increase in the capacity of the dams at Serre-Ponçon (+55MW) and La Bathie (+45MW) in France.</li> </ul>
Onshore wind power	<ul style="list-style-type: none"> <li>■ Commissioning of three major wind farms in the United States: Shiloh III (102.5MW) and Pacific Wind (140MW) in California, and Spearville 3 (100.8MW) in Kansas by EDF Énergies Nouvelles.</li> <li>■ Commissioning of EDF Énergies Nouvelles’ first Canadian wind farm (80MW).</li> <li>■ Commissioning of the Linowo plant (48MW), Poland, by EDF Énergies Nouvelles.</li> <li>■ Start of operation for the Green Rigg wind farm in the United Kingdom, by EDF Energy Renewables (36MW).</li> <li>■ Acquisition by EDF Luminus of the Ciney wind farm (10MW) in Belgium.</li> </ul>
Offshore wind power	<ul style="list-style-type: none"> <li>■ Onsite testing of the hydropower demonstrator off the coast at Paimpol-Bréhat in France (October 2011 – January 2012); subsequent technical adjustments were tested and validated in a second immersion.</li> </ul>
Solar power	<ul style="list-style-type: none"> <li>■ In 2012, EDF Énergies Nouvelles commissioned three major solar projects in France: Toul-Rosières (115MWc) in Meurthe-et-Moselle, Crucey (60MWc) in Eure-et-Loir, and Massangis (56MWc) in Yonne.</li> </ul>



## Capacities under construction

Onshore wind power	<ul style="list-style-type: none"> <li>The Fallago Rig (144MW), Boundary Lane (6MW), Glassmoor and the Glassmore extension (12MW) wind farms in the United Kingdom by EDF Energy Renewables.</li> <li>The Massif du Sud (150MW) and Lac Alfred (300MW) facilities in Canada, by EDF Énergies Nouvelles.</li> </ul>
Offshore wind power	<ul style="list-style-type: none"> <li>The Teesside offshore wind farm (62MW) off the British coast by EDF Energy Renewables, due to be commissioned in 2013.</li> </ul>
Solar power	<ul style="list-style-type: none"> <li>Construction has begun on the Catalina plant in the United States (140MW in California) by EDF Énergies Nouvelles.</li> </ul>

## Other developments

Offshore wind power	<ul style="list-style-type: none"> <li>Creation of a 50/50 joint venture in April 2012 by EDF Energy and Eneco Wind UK Limited, covering exclusive development rights to phase 3 of the Navitus Bay offshore wind farm to the west of the Isle of Wight. This development could supply between 900MW and 1,200MW wind power capacity. The building permit is expected to be issued in 2015 and the first phase of construction work should start in 2017.</li> <li>Start of operating phase for the river hydropower project in Guyana by EDF Systèmes Énergétiques Insulaires<sup>1</sup>.</li> </ul>
Marine energies	<ul style="list-style-type: none"> <li>Progress on the marine STEP (pumped storage power stations) in Guadeloupe and La Réunion by EDF Systèmes Énergétiques Insulaires<sup>1</sup>.</li> <li>Two pilot projects headed by EDF Énergies Nouvelles: <ul style="list-style-type: none"> <li><i>Houles Australes</i>, off the coast of Réunion Island, trying out a system to convert waves into energy; a new milestone was reached in 2012 with work to immerse a full-scale prototype;</li> <li>the VertiMed project for a floating wind farm, involving joint work by the industrial firm Technip and the start-up company Nénuphar to make an innovative turbine: paddles turning on a vertical axis and a floating system that can work independently of the seabed depth. A pilot site will be developed off the coast near Marseille.</li> </ul> </li> </ul>
Solar power	<ul style="list-style-type: none"> <li>Continuation of the Millener project in French overseas territories. This project was launched in 2011 and aims to install rooftop solar power systems in homes, with individual energy storage and computerised consumption management facilities.</li> </ul>
Geothermal projects	<ul style="list-style-type: none"> <li>A geothermal project by EDF Systèmes Énergétiques Insulaires<sup>1</sup> in Dominique, which will also supply energy for Guadeloupe and Martinique.</li> </ul>

### 6.6.2.4.2 Management of water resources

In view of the importance of water resources for its electricity and heat businesses (cooling for fossil-fired plants; hydropower generation), the EDF group includes water risks in its risk management policy. Every investment decision is subjected to detailed risk analysis and impact studies. In France, a strategic committee for water has drawn up a water policy and oversees its implementation. This policy is a response to four major concerns: "preparing for tomorrow" (EDF must meet the demands of society in a more complex context for sharing the resource of water); adjusting to regulatory and societal change; contribution to multi-use management of water and local economic development; and optimising the energy producer's operational management of water.

2012, like 2011, was a very dry year with water shortages in France, EDF managed its reservoirs so as to preserve electricity output, support water flows for fossil-fired and nuclear power plants, and share water resources with local users (farmers, other industrial users, fishermen, and green tourism promoters), including in south-west France where rainfall and reservoir water levels were the most sensitive.

EDF and the Group's companies are seeking to optimise water use by industrial facilities, especially fossil-fired plants. In Italy, a rainwater recovery system has been installed at the Torviscosa plant to redirect water back into the operating process, and at the Marghera Levante plant waste water is sent to a treatment centre so it can be reused in other industrial processes.

In Poland, modernisation of the water demineralisation and decarbonisation station was completed in 2012 and water consumption is now at minimum levels.

Group figures, in billions of m <sup>3</sup>	2012	2011	2010
Cooling water drawn	54.8	55.2	53.9
o/w fresh water (including brackish water)	28.0	26.8	NR
Cooling water returned	54.2	54.6	53.3
o/w fresh water (including brackish water)	27.5	26.3	NR

NR – not reported.

Nearly 99% of the volumes of water drawn is returned to the natural environment, in compliance with local rules on quality and temperature.

<sup>1</sup>. Island Energy Systems.

EDF is increasingly active on the international scene, through the World Business Council for Sustainable Development (WBCSD) Water working group (EDF joined the Water Leader Group in 2010), and through the World Water Forum.

At the sixth Forum ("WWF6") held in Marseille in March 2012, EDF promised to invest the resources required for development with the scientific community of methods and tools to assess the water footprint of its electricity generation activities in its installations' local areas, in order to extend its knowledge of action synergies between water and electricity.

The EDF group made commitments to:

- control the water footprint of its electricity generation activities, and more particularly:
  - to continue improving performances in terms of water drawings and water consumption by power plants;
  - to seek the most efficient use of the water possible, at the level of local administrative areas and water catchment basins.
- create some value locally, and incorporate the aim of minimising its water footprint from the design phase whenever an electricity generation project is in development, in line with its CSR commitments. In particular, the EDF group has undertaken to use the IHA's Hydropower Sustainability Assessment Protocol for its hydro-electricity projects;
- carry on the work begun for preparation of the WWF6 on the linkages between water, energy and food, in particular with the CGIAR (Consultative Group on International Agricultural Research) and the IHA. Wetlands International<sup>1</sup> decided to join this commitment by pursuing research into water-food-energy interactions.

#### 6.6.2.4.3 Soil management

The Group's industrial activities can cause soil pollution. An action plan exists for all Group real estate assets:

- identification of real estate sites (this stage is complete for EDF);
- identification of sites potentially affected by pollution;
- analysis of soil samples from the potentially polluted sites, beginning with sensitive areas;
- monitoring those sites to control sources of pollution and develop a management plan;
- and lastly rehabilitation where relevant, depending on the future use and regulatory requirements.

#### Askarel transformers

European directive n° 96/59/EC of 16 September 1996 requires an inventory of equipment containing PCBs and PCTs<sup>2</sup>, together with a national plan for decontamination and the gradual elimination of these substances, which are principally found in certain electricity transformers and condensers.

Decontamination of equipment with containing more than 500ppm PCBs was completed by the regulatory deadline of 31 December 2010 (70,000 transformers were removed between 2006 and 2010). ERDF has since embarked on depollution of transformers with PCB content below 500ppm, ahead of the regulatory requirement to do so. 10,000 such transformers were treated in 2012.

#### Phytosanitary products

The Group's Real Estate division launched an inventory of phytosanitary product consumption in 2010 across all property sites managed in France. This brought results: in 2012, consumption was reduced by 21% compared to 2009 levels.

### 6.6.2.5 Climate change

Thanks to the high proportion of nuclear and low-carbon renewable energy plants in its generation fleet (including hydropower facilities), the EDF group firmly intends to remain the leading energy operator in action to fight climate change and reduce greenhouse gas emissions. It subscribes to the EU objective of cutting emissions by at least 20% between 1990 and 2020, taking into account the diversity of local energy situations.

The Group is addressing the issue of climate change by investing in low-carbon or carbon-free generation facilities, including renewable energies and nuclear power, with the aim of achieving installed generation capacity of 160GW (net) by 2020, 75% of which do not emit any CO<sub>2</sub>.

Meanwhile, the Group's strategy also involves helping customers to reduce their own CO<sub>2</sub> emissions by creating and promoting eco-efficient packages and advice on rational energy use.

#### 6.6.2.5.1 Reducing CO<sub>2</sub> emissions by industrial facilities, particularly in generation

In 2012, the Group produced 79,803 thousand tonnes of CO<sub>2</sub> emissions worldwide. In France, EDF produced 16,409 thousand tonnes of CO<sub>2</sub> even though close to 96% of electricity generation emits no CO<sub>2</sub>, bringing its specific emission rate to 35.2g of CO<sub>2</sub> per kWh.

## CO<sub>2</sub> emissions by electricity and heat generation

In g/kWh	2012	2011	2010
EDF group	117.0	99.6	108.9
EDF	35.2	30.4	40.1

1. Wetlands International: an international nonprofit organisation for conservation and restoration of wetlands.

2. PCBs: Polychlorinated biphenyls; PCTs: polychlorinated terphenyls.

EDF has several levers to reduce and maintain at one of the lowest European level its greenhouse gas emissions:

- in the short term, optimisation of the generation fleet by improving operating performance;
- in the longer term, adapting the generation fleet: renewing plants (combustion turbine and combined-cycle gas plants), protecting hydropower potential, developing renewable energies and downgrading the highest-pollution facilities.

### Fossil-fired plants

The environmental performances of fossil-fired plants have been constantly improved in response to the progressively stricter regulatory requirements. Investment programmes incorporate the requirements for improvement of air quality and reduction of atmospheric emissions. They also respond to the regulations on greenhouse gases, taking into consideration security of supply and the cost of fossil fuels.

Since the "DeNO<sub>x</sub>" systems to reduce nitrogen oxide were put into operation in 2007 and 2008, atmospheric emissions have fallen considerably.

In France, EDF is continuing its "BasNO<sub>x</sub>" (or "low-NO<sub>x</sub>") emission-cutting projects at reactor 3 of the Porcheville and Cordemais plants. With the exception of the Martigues site which is governed by specific regulations, all oil-fired facilities now use oil with very very low sulphur content (0.55% sulphur). With R&D, EDF is continuing studies on reducing NO<sub>x</sub> emissions through the Sperone Q600 project (low-NO<sub>x</sub> configuration studies to optimise boiler operation).

In Italy, Edison's fossil-fired fleet consists entirely of high-efficiency, low-carbon CCG plants.

In Poland, the fossil-fired plants are particularly challenged by pollutant emissions in the air. Most of EDF Polska's boilers are now fitted with low-NO<sub>x</sub> burners. In preparation for application from 1 January 2016 of the EU's Industrial Emissions directive that will limit sulphur dioxide (SO<sub>2</sub>) and nitrogen oxide (NO<sub>x</sub>) emissions to 200mg/Nm<sup>3</sup>, EDF Polska issued a call for tenders in late 2011 concerning installation of desulphurisation systems in the EC Krakow, Kogeneracja and EC Wybrzeze cogeneration units.

The Group is pursuing these renovation and modernisation programmes for existing fleets. In France, two CCGTs were commissioned during 2011 and 2012, at the Blénod (430MW) and Martigues (465MW) sites. The programme will continue in 2013 with commissioning of Martigues' second CCGT (also 465MW), and the start of excavation work for the CCGT at Bouchain (250MW) in north France. In late 2011 EDF signed a partnership agreement with General Electric for joint development of a new-generation CCGT at the Bouchain site. It will use FlexEfficiency50 technology, and benefit from the best technical performances (efficiency raised to 61%, 3-4% higher than a traditional CCGT) and environmental performances (CO<sub>2</sub> emissions cut by 10%). Commissioning is currently scheduled for late 2015.

From 2013, these three CCGs will replace nine 250MW coal-fired plants and one 600MW unit, eliminating SO<sub>2</sub> emissions, halving CO<sub>2</sub> emissions and cutting NO<sub>x</sub> emissions by two thirds.

In the United Kingdom, construction of the new combined cycle gas plant at West Burton (3 units with combined power of 1,300MW) was finalised in 2012 according to plan. The first unit came on line in 2012 and commercial output begins in early January 2013, followed by the other two units also in the early part of 2013. Serving 1.5 million customers every year for a forecast operating lifetime of 25 years, this plant will contribute to achievement of EDF Energy's objective for 2020: to cut specific CO<sub>2</sub> emissions by 60%.

Finally, concerning CCS (Carbon Dioxide Capture and Storage) technology, the EDF group is participating in post-combustion and oxy-combustion harnessing projects with both Group and non-Group industrial partners, and

studies concerning the transmission and storage of CO<sub>2</sub>. A carbon capture demonstrator is currently being built at Le Havre in conjunction with Alstom and Veolia Environnement, with the support of the French environment and energy management agency ADEME (see section 6.2.1.1.5.2 ("Issues relating to fossil-fuel fired generation"))).

### 6.6.2.5.2 Diffuse greenhouse gas emissions

A plan to cut emissions from EDF's buildings and vehicle fleets has been in application since 2010. In addition to direct emissions by its industrial facilities, EDF is committed to reducing its diffuse emissions from office buildings, company vehicles and business-related travel, and to promote a DSM programme with Group employees.

The EDF group manages a significant real estate portfolio (more than 4.5 million m<sup>2</sup> excluding electricity generation buildings). The Group monitors and seeks to reduce the environmental impact of all its buildings, whether owned outright or leased.

The targets for reduction of diffuse emissions by the service buildings owned and leased by the Group draw on the following levers:

- DSM actions through adjustment of the way installations are operated;
- optimisation of surface occupation;
- renewal of the portfolio of owned buildings;
- use of the best available technology;
- application of energy performance contracts for all office locations under subcontracted management.

To support this plan, EDF joined the International Sustainability Alliance (ISA) in 2010. The ISA's main objective is to contribute to development of sustainable buildings at European and worldwide level. Since this primarily requires good knowledge of the current portfolio's actual performance, ISA members have joined forces with the BRE (Building Research Establishment) to create an environmental database currently covering some 10,000 buildings. Environmental data are translated into key performance indicators on energy and water consumption, CO<sub>2</sub> emissions, and waste production, in line with the indicators prepared in other international initiatives (including the Global Reporting Initiative).

Company Commuter Plans have already been introduced in most of France and are being rolled out progressively to all Group companies.

Each Group company now has its own specific strategy adapted from the Group strategy, as appropriate to its business and the energy environment in which it operates.

### 6.6.2.5.3 Demand side management

Promoting energy efficiency to all customers is an integral part of the EDF group's sustainable development policy, and one of the principal levers in the battle against climate change. Regular communication and feedback is developed between EDF, EDF Energy, Edison, and EDF Luminus to optimise both customer relations and the efficiency of product offerings designed to control energy consumption.

In France, in connection with the Environment Round Tables known as the *Grenelle de l'Environnement*, EDF is actively involved in developing offers that encourage customers to control their demand for energy and give priority to the lowest-carbon generation methods. This commitment to energy control is guided by the energy saving certificate system, which assigns every supplier obligations to save energy with customers. A three-year target saving is defined and allocated between operators based on their sales volumes:

- 54TWhp for the first period, from 1 July 2006 to 30 June 2009;

- 345 TWhp for the second period, from 1 January 2011 to 31 December 2013.

In its sustainable development policy, which was adjusted in March 2012, EDF has set itself the goal of accompanying all customers in the move towards a cumulative reduction of 2 million tonnes in CO<sub>2</sub> emissions between mid-2009 and 2013, by stepping up promotion of energy efficiency in its

marketing campaigns. The company takes action by marketing offerings that give customers better control over their energy consumption, or by recommending qualified partners to them. One essential aspect of its work concerns improving insulation in the homes of people with low financial security (see section 6.6.3.3.1 ("Contributing to action against energy poverty")).

## DSM action by EDF with residential customers, professional customers and authorities in 2012

### Mainland France

Promotion of energy saving	<ul style="list-style-type: none"> <li>■ Launch of eight commitments entitled "EDF &amp; me" to residential customers; the 5th concerns helping customers to consume the necessary energy better.</li> <li>■ Online promotion of environmentally-friendly behaviours and free advice on efficient insulation and heating for residential customers.</li> <li>■ Approximately 70% of the advertising budget is devoted to promoting energy saving in the residential customer segment.</li> <li>■ Ongoing funding of training in saving energy, for employees and people in the building sector (50,000 professionals trained since 2008); the course is being opened up to materials suppliers and project managers.</li> </ul>
Awareness-raising/information	<ul style="list-style-type: none"> <li>■ Trials with free "Energy Label" advice, that shows residential customers the heat efficiency of their home. This will be adopted for all customers in 2013.</li> <li>■ Online availability of self-diagnosis services accessible to all business and local authority customers, so they can compare their energy consumption with standard ratios and contact an adviser if they wish.</li> <li>■ Introduction of a Network for Energy Efficiency: around ten businesses and authorities from the same employment area meet over three years to share ideas for more efficient energy use.</li> <li>■ 5<sup>th</sup> low-carbon architectural competition, intended to encourage firms, architects and project commissioners to design innovative homes that meet the most advanced energy and environmental efficiency criteria.</li> </ul>
Energy-efficient offers and advice	<ul style="list-style-type: none"> <li>■ Development of the "energy and fluid optimisation" service, which enables industrial companies to measure their consumption in real time for each production line, site, period and product, and receive advice on areas for optimisation that can cut consumption levels.</li> <li>■ Development of the Energy Productivity Plan with large firms: EDF makes a commitment to make energy savings (and is rewarded by a share of the savings achieved over a multi-year period).</li> <li>■ Launch of the City Energy Prospects offering to assist local authorities with their energy policies (local energy generation systems, electric mobility, energy efficiency in buildings).</li> </ul>
Heat surveys of buildings	<ul style="list-style-type: none"> <li>■ Reinforcement of the home assessment offer named <i>Objectifs Travaux</i> which attracted 13,000 new customers in 2012 (100,000 in all since the initial launch).</li> <li>■ General rollout in EDF stores of the heat diagnosis service that enables customers to identify heat losses from their homes (2,000 customers).</li> </ul>
Financing solutions	<ul style="list-style-type: none"> <li>■ <i>Prêt Habitat Neuf</i> loans for buyers of newly-built homes and <i>Prêt Rénovation Bleu Ciel®</i> for buyers of existing homes, provided by EDF via its subsidiary Domofinance.</li> <li>■ Introduction of a loan for energy renovation of collectively-owned housing.</li> <li>■ Partnership with Oseo to promote a loan for environmental and energy efficiency to business customers and local authorities.</li> </ul>



## Corsica and overseas French Departments and collectivities

Awareness-raising/ information	<ul style="list-style-type: none"> <li>■ In Corsica, introduction of <i>Jour'Eco</i>, an online alert system that encourages moderate energy use in peak periods and conveys the ADEME's recommendations for lower consumption.</li> <li>■ Organisation of the first Energy saving festival village in Guadeloupe, to raise awareness of energy efficiency among operators in refrigeration and solar power, planners and architects.</li> <li>■ In Guadeloupe, joint launch with the ADEME and the NGO Prioriterre of the "Positive energy family" challenge, to encourage individuals to cut energy consumption by at least 8%.</li> </ul>
Management of consumption	<ul style="list-style-type: none"> <li>■ Development of sustainable development agreements with local authorities, in which EDF undertakes to contribute to their investments in energy control.</li> <li>■ Signature of a heat renovation convention on Réunion island.</li> <li>■ Launch of the Energy Box in Corsica, to reduce energy consumption and foster incorporation of renewable energies.</li> <li>■ Opening of a Business Club in Martinique, bringing together the principal firms on the energy efficiency issue (this generated more than a hundred energy assessments).</li> <li>■ Launch of Citeco, a scheme reserved for local authorities in Réunion Island, offering grants for investment in a range of energy-efficient solutions (e.g. €100 per streetlight up to a maximum 20% of the total investment).</li> </ul>

### 2012 actions by Group companies

## EDF Energy, United Kingdom

Management of consumption	<ul style="list-style-type: none"> <li>■ Regulatory contribution (£89 millions) to the government's Community Energy Saving Programme for the period 2010-2012.</li> <li>■ Continuation of the EcoManager energy monitor for residential customers, showing energy consumption by electric appliances in order to help people cut energy use; 257 customers signed up in 2012.</li> </ul>
Energy efficiency	<ul style="list-style-type: none"> <li>■ Introduction of online self-diagnoses of energy use (more than 19,000 since the launch in mid-2011).</li> <li>■ Promotions of energy efficiency measures on the back of all customer invoices.</li> </ul>

## Edison, Italy

Awareness-raising/ information	<ul style="list-style-type: none"> <li>■ Sponsorship of the TV programme "Mr Green is coming", which promotes lower energy consumption through learning environmentally friendly habits.</li> </ul>
Energy efficiency	<ul style="list-style-type: none"> <li>■ Independent electricity generation for industrial customers (installation of solar facilities for the Mapei and Roche groups).</li> <li>■ Design of an energy-efficient offering for the tertiary sector.</li> </ul>

## Electricité de Strasbourg, France

Monitoring consumption	<ul style="list-style-type: none"> <li>■ Roll-out of three new services for small business customers (Energy Control Advice, Consumption measurement and Thermal Imaging) to help them monitor consumption levels and control energy use.</li> </ul>
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## EDF Luminus, Belgium

Management of consumption	<ul style="list-style-type: none"> <li>■ Continuation of the "Luminus Bonus" offer, a bonus paid to individual customers whose energy consumption was lower than in the previous year; promotion of this offer to 75,000 customers.</li> <li>■ Online consumption monitoring service (the <i>Mijn Verbruik</i> / My Consumption programme).</li> </ul>
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## Electric mobility

In France, EDF has invested in research and development of solutions to promote electric mobility. Together with several different manufacturers, public research institutes and local authorities, it participates in development of new vehicles (buses, delivery trucks, "cherry picker" vans), works on improving battery discharge time and overall battery life, and contributes to the improvement of recharging infrastructures (communication capacities with all types of vehicles, geolocalisation, monitoring to avoid spikes in consumption, etc). The company has become involved in commercial activity as an electric mobility operator, launching electric vehicle rentals and conducting experiments in self-service shared electric cars via its subsidiary Sodetrel.

In Belgium, EDF Luminus and The New Drive are helping businesses and public authorities to progressively convert their car fleets to electric cars, through the GreenDrive Business Pack. Together with Renault, the company is marketing "ThePlugInCompany" service to some twenty business customers, offering the chance to test drive an electric car for one week.

## Smart grids

A European Directive requires, to promote competition and energy savings, 80% of electricity meters have to be "smart meter" by 2020. Smart meters allow the control of electrical installations remotely and making many interventions at the client in a much shorter time and without his presence is required (meter reading, power change, commissioning...).

Beyond the smart meters, making new information and communication technologies a more integrated part of modern electricity networks will help bring about the transition towards a carbon-free energy economy.

The new grids will facilitate inclusion of intermittent renewable energies, and adoption of new uses (heat pumps, electric vehicles/rechargeable hybrid vehicles, etc), both key factors for the future of distribution networks.

The aim is to create mesh networks equipped with remote control systems and software to identify damaged areas in the network, and compensate for any shortfalls or even optimise electricity deliveries.

The new grids will allow consumers to take charge of their energy use, to achieve greater energy efficiency in interaction with the network.

To meet this requirement in France, ERDF and the French energy regulator CRE launched the Linky project to modernize the 35 million electricity meters all over France. More than 250,000 Linky smart meters have been installed in the Lyons and Indre-et-Loire areas of the country in an initial experiment.

The Group's distributors are cooperating on these new networks. Along with other European distributors ERDF took part in the launch of the "EDSO for smart grids" association created to share experiences and establish an industry standard.

### ERDF coordinates the GRID4EU project ("Grid for you")

ERDF is to coordinate this major initiative, which has been set up as part of the European Commission-financed smart grid research programme. GRID4EU is the largest programme for smart grids co-financed by the European Union (€25 million of the total €54 million cost), and will involve a consortium of six European distributors representing 50% of customers in Europe.

The aim is to work together to move forward on:

- integration of generation from renewable energy sources;
- automation and security of the electricity network;
- effective customer participation in consumption management;
- support for development of electric vehicles and electricity storage solutions.

## 6.6.2.5.4 Adapting the group's businesses to climate change

As climate change directly affects energy demand and the physical environment in which generation, distribution and transmission are carried out, the EDF group has a strategy for adaptation to climate change, adopted by the Sustainable Development Committee in June 2010. This strategy concerns current and future industrial facilities, customer offers, production/consumption optimisation, and R&D themes. It is organised around the following aims:

- evaluating the impact of climate change (currently in operation and predicted) on installations and activities;
- adapting the installations concerned to reduce their sensitivity to extreme weather conditions;
- taking future weather and climate into consideration in the design of new facilities;
- improving resistance to extreme changes and situations that are harder to predict.

## 6.6.2.6 Preserving biodiversity

Like the struggle against climate change, preserving biodiversity is a major priority for the EDF group, as the owner of large reserves of land, mostly located in France in or immediately next to protected natural areas. The Group constantly monitors the environmental impacts of its industrial activities in order to better control and reduce them.

The Group takes environmental offset measures in application of European and national regulations. Most cases concern applications for permission to destroy protected species due to work on construction or maintenance of industrial installations (around 15 applications in France and the UK since 2008).

In France, EDF is testing various environmental offset methods and ways of assessing the eco-systemic services it uses (e.g. current testing at the Cordemais fossil-fired plant of the Ecosystem Service Review) and represents the Eurelectric association in the European Commission's "No net loss" working party. After the French Ministry for Ecology, Sustainable Development and Energy launched a call in 2011 for projects to study feasibility of environmental offset mechanisms, EDF was selected to conduct an experimental operation of ecological offset offers in the Rhone-Alpes region of France. The project involves rehabilitation of 120 hectares of Alpine land in the Belledonne mountains to create a favourable habitat for flora and fauna; in particular, introducing measures to reintroduce the black grouse, which is an endangered species. The restored land will be used both to offset EDF's work on hydropower facilities, and to meet offset needs for other projects specific to the region: development of winter sports stations, town planning projects, railway projects, etc. The operation is scheduled to last 8 years. Afterwards, the land will remain the property of EDF, but will be incorporated into a National reserve for hunting and wildlife ("RNCFS").

The managements of industrial installations have implemented biodiversity strategies. The hydropower fleet applied the action plan for its new 2010-2012 strategy. One key action was adapting site management for maintenance of the Sarrans dam, which is located in the Natura 2000 protected zone: to preserve the red kite and the peregrine falcon, low-noise machines (electric cranes) were chosen to reduce unnecessary noise in the reproduction period. In 2012 the management of EDF's fossil-fired fleet began a strategic biodiversity plan to take a detailed census of local regulations for each of its industrial sites, and identify protected areas and biodiversity preservation areas for each plant. In a similar vein, steps are

being taken to list the available land at the nuclear power plants, in order to map out the natural areas.

The research and development aspect of the framework agreement for protection and restoration of water environments signed in 2011 by France's national water office (ONEMA) and EDF gave rise to the following operations in 2012:

- report on behavioural studies of eels, and how river obstacles affect their migration and mortality (previously the "Eels and industrial facilities" R&D programme launched in 2008 by the national eel committee, under the MEEDDAT and the Ministry of Agriculture and Fisheries (*Ministère de l'Agriculture et de la Pêche*)); EDF has made a significant contribution to this research by testing a bristle brush eel pass at the high dam at Golfech (Garonne), preparation and testing of an automatic photoelectric counter for small eels, on-site evaluation of mortality in large turbines, studying how eels move past hydroelectric facilities along the Gave de Pau river and a series of obstacles along the Rhine, testing the Migromat® biomonitor in the river Shannon in Ireland, testing an ultrasound repellent system near two hydropower plants on the river Gave de Pau, and developing a working turbine management model on the river Loire;

- heat and hydrobiology research programme (approved by the Ministry of Ecology and the ASN) examining the preferences and heat tolerances of the main species of fish, the behaviour of fish in varying temperatures, the role played by temperature in the spatial distribution of species, and the influence of temperature on the behaviour of bacteria and algae (results to be reported in 2013).

The Group is pursuing a policy of biodiversity partnerships to encourage exchanges of technical knowledge, support projects led by associations and implement practical technical projects. Priority is given to projects with EDF's longstanding NGO partners: the Bird Protection League (*Ligue pour la Protection des Oiseaux*), the Coastal Protection Agency (*Conservatoire du Littoral*), French Nature Reserves (*Réserves Naturelles de France*), the French Committee of the International Union for Conservation of Nature, and the National Federation for Fishing in France (*Fédération nationale pour la pêche en France*) (see section 6.6.3.2.3 ("New orientation for the sustainable development partnership strategy")).

## Other measures to protect and restore biodiversity in 2012

Edison (Italy)	<ul style="list-style-type: none"> <li>■ Introduction of biodiversity mapping of the areas around all the company's generation sites, to prioritise action on sites affected by Italy's national strategy for biodiversity. Work on setting up operational and technical partnerships with environmental NGOs active in the sensitive areas concerned.</li> </ul>
EDF Energy (United Kingdom)	<ul style="list-style-type: none"> <li>■ £120,000 contribution to the development fund for the Suffolk Coast and Heaths Area of Outstanding Natural Beauty, as part of the project to extend the dry fuel store at the Sizewell B plant. The contribution is for restoration of natural habitats, creation of footpaths, improvement of disabled access and tourist information campaigns.</li> </ul>
EDF Énergies Nouvelles	<ul style="list-style-type: none"> <li>■ Commitment to regular biological and ecological monitoring of all new generation sites; introduction of eco-management plans for these sites, with differentiated mowing of the covering vegetation and no chemical fertiliser or pesticide.</li> <li>■ Continuation of the biodiversity preservation programme on the photovoltaic site at Toul (Meurthe-et-Moselle), with installation of shelters to protect bats, integration of landscaped woods and hedges, and planting melliferous flowers plants for bees.</li> </ul>
UTE Norte Fluminense (Brazil)	<ul style="list-style-type: none"> <li>■ Reinforcement of management instruments for the Macaé de Cima environmental protection zone and the Três Picos state park to preserve the primary Atlantic forest, in partnership with the State institute for the environment (environmental offset programme).</li> <li>■ Funding through the Ramsar Convention of a study on the wetlands of north Rio state, which are currently under threat.</li> </ul>
ERDF (France)	<ul style="list-style-type: none"> <li>■ Continuation of the action plan to save the Bonelli's eagle.</li> <li>■ Introduction of a differentiated pruning policy along grid lines, according to the species of vegetation encountered.</li> <li>■ Partnerships with France Nature Environnement and the Bird Protection League (<i>Ligue pour la Protection des Oiseaux</i>), to reduce the risks of electrocution for birds.</li> </ul>
EDF Guadeloupe	<ul style="list-style-type: none"> <li>■ Signature in May 2012 of a partnership with the association Kap'Natirel, to protect sea turtles (study of behaviour and protection in the laying period).</li> <li>■ Implementation of the partnership signed in 2011 with Port Autonome de Guadeloupe and the Comité des pêches to rebuild a coral environment using recycled concrete electricity poles. The poles are dropped offshore where they provide sealife with similar protection to coral reefs.</li> </ul>
EDF Guyane	<ul style="list-style-type: none"> <li>■ Ongoing work by the Scientific Committee on water quality in the Petit-Saut reservoir, particularly changes in the way immersed vegetation decomposes. The results of these observations are used in Unesco-sponsored research into hydropower in the tropical environment.</li> </ul>
EDF Luminus (Belgium)	<ul style="list-style-type: none"> <li>■ Pursuit of a study on mortality and migration of salmon and eels; this is a prerequisite for the Lixhe hydropower plant to be authorised to operate.</li> <li>■ Calculation of the ecological footprint of the companies' industrial activities (scopes 1, 2 and 3 of the Greenhouse Gas Protocol).</li> </ul>

EDF Real Estate division	■ Campaign to reduce use of chemical weedkillers and fertilisers on all sites (cut by 8% a year on average in the hydropower fleet), or eliminate it completely in favour of manual weeding, thermal steam weeding, late mowing and fallow land including native wild flowers.
EDF hydropower generation and engineering division (France)	■ Inauguration of the fish pass at Jons sur le Rhône in November after 10 months of work. ■ Continuation of operations under national action plans, particularly in favour of protection of the Pyrenean desman and bearded vulture (organising maintenance work for high dams according to the nesting periods).

### 6.6.3 Societal information

The EDF group's societal policy aims to create and develop bonds and dialogue with all external stakeholders at all levels (worldwide (UN, NGOs), regional (European Union, etc), national and local), to optimise and strengthen connections with vulnerable customers, by helping to reduce energy poverty and make intraGroup links more active.

This policy incorporates, supports and reinforces the existing initiatives, ensuring they are coherent within the Group. The principles of the policy comply with the United Nations Global Compact and are part of the EDF group's sustainable development policy, its CSR agreement and the public service contract (see section 6.5.2 ("Public service in France")).

#### 6.6.3.1 Ethics and transparency to stakeholders

The Group Management's decision to renew and adjust its ethical guidelines (the 2007 Ethics Guide) led to concerted elaboration of a new Group charter of ethics was during 2011. This Charter was adopted by the EDF group's Management Committee in September 2012 and approved in October by the Board of Directors' Ethics Committee. It complements the laws, regulations and national and international conventions that apply to each company and each employee of the Group. Its straightforward, common-sense commitments are intended to encourage every employee, whatever his or her country or position, to behave in an exemplary way in line with the EDF group's values of respect, responsibility and solidarity. These ethical commitments translate the public-interest mission of a worldwide energy operator into the Group's core businesses. They were drawn up in conjunction with Group companies and divisions; test groups were formed involving employees and managers to ensure that good adherence to the subjects proposed, with respect for the specific culture of each country where EDF operates. The Group's new standards will be in general application by the end of 2013.

The Chairman and CEO's decision of 14 September 2010 on anti-fraud action in the Group, with its basic principle of zero tolerance, has been in application since late 2010. To ensure this decision is correctly implemented, the managers have prepared and adopted anti-fraud plans in the principal entities, supported by the distribution of the Group fraud prevention guidelines which specifically address risks of fraud and corruption.

On the issue of corruption, procedures for validation of intermediaries' contracts have been reinforced following application of the Chairman's decision of 31 May 2010 on consultancy and agency agreements.

A programme to raise awareness of EDF's criminal risk (Chairman's decision of 28 July 2011) was launched in response to the emergence of higher

exposure to this type of risk as the Group has expanded and diversified its establishments across the world. This also results from tightening of anti-corruption laws in the US (the 1997 Foreign Corrupt Practices Act, reactivated in 2008) and the UK (the Anti-Bribery Act, effective from 1 July 2011): due to the extraterritorial aspect of these laws, international anticorruption regulations are taking shape.

To reduce the Group's exposure to the risks associated with application of competition rules, the competition compliance programme deriving from the Chairman's decision of 22 December 2010 extended its awareness-raising and training action in 2011 to the greatest possible number of operative staff in all subsidiaries, both in and outside France

All these ethical actions are subject to the Group's internal control, which was broadened in 2011 to generalise practices that encourage auto-evaluation and sharing of good practices, in line with the recommendations on Ethics and Anti-fraud measures that make up some of the first sections of the Group's internal control guide.

The scope and practicalities of EDF's ethical alert procedure, which also receives employees' calls requesting intervention by the company on the free "life at work" number, were validated by the French data protection agency CNIL on 24 November 2011.

In 2011, EDF, DONG Energy, Enel/Endesa, E.ON, GDF Suez/Electrabel, RWE and Vattenfall/Nuon, later joined by Fortum, all worked together on the Bettercoal initiative to improve responsible commitment by businesses belonging to the coal supply chain, with particular emphasis on respect of fundamental rights at mining sites. The aim is to guarantee respects of those rights, i.e. human rights, working conditions, workers and community life, and environmental protection. European energy operators and North American mining companies are frequently criticised for failing to respect rights, as was the case in 2010 for certain companies in connection with coal imports from Colombia, forcing North European companies to limit their sourcing at very short notice. EDF Trading, a fully-owned Group subsidiary and vital actor in the European coal industry, supplies approximately 10 million tonnes of coal a year to plants belonging both to the EDF group and other firms. The EDF group signed up to the Bettercoal charter in January 2012, to support EDF Trading's activities in coal sourcing, keep EDF's position in socially responsible investment funds, and control the risks to its image and reputation. During the first half of 2012, a code (common standards) of social, environmental and ethical principles was formally defined, in line with existing international standards (issued by organisations such as the International Labour Organisation) and existing measures concerning the extractive industries (e.g. the Extractive Industries Initiative). Audits and auto-evaluations of suppliers under this code will cover suppliers, including mining sites, and audit results will be recorded in a dedicated database managed by Bettercoal and shared by its members in compliance with antitrust rules.



### 6.6.3.2 Dialogue with stakeholders

All Group companies engage in dialogue with stakeholders, each using its own procedures. This dialogue covers 5 areas:

- local consultation concerning generation sites and proposed new industrial establishments;
- organised customer relations, suppliers, sector partners, socio-professional associations, local authorities and national and international institutions;
- operational partnerships with NGOs and the academic world;
- gatherings of experts and representative personalities in independent boards or panels to provide Group managers with external critical analysis;
- information and education in energy and sustainable development issues, especially for young people.

#### 6.6.3.2.1 Informing local populations near generation sites and consultation on industrial projects

In France, 38 local information commissions consisting of elected officials, State representatives, associations and professional bodies keep local residents informed of nuclear facility activities, as required by regulations. EDF works with these commissions at its power plants and provides the information needed to fulfil their mission.

In addition to this regulatory system, EDF has set up a public information centre at each nuclear power plant to inform local populations of the plants' operations and impacts, energy-related issues, control of energy consumption and presentation of business lines that will provide jobs in the electricity sector in the future. At the 2<sup>nd</sup> Industry Days held on 6 and 7 October 2012, more than 15,400 people visited EDF's generation sites (45% came to nuclear plants, 38% to hydropower plants and 17% to fossil-fired plants). In line with the past two years, EDF's image with local populations remained broadly positive, with 86% declaring it has a good image (83% in 2011).

In hydropower, EDF pursued its permanent information and safety campaigns to warn water users of the risks of variable water flow in the rivers, including installation of boards with photographs showing the "before and after" situation. Hydroguides were again employed in the summer season.

For new industrial projects, Group companies are reinforcing their consultation and information approaches based on tried-and-tested models used by NTPC for the Nam Theun dam in Laos, Edison for the Rovigo regasification terminal and the ITGI (Interconnector Turkey-Greece-Italy) gas pipeline in Italy, and EDF for installation of the marine turbine demonstrator at Paimpol-Bréhat in France.

In France, for the preparation of construction of the CCG plant at Bouchain scheduled for commissioning in 2015, discussions took place with the various stakeholders concerned: local authorities, the regional environmental, planning and housing authority, the Nord-Pas-De-Calais regional council and several associations. The public inquiry then opened in autumn 2012 and the conclusions are expected for early 2013.

In the United Kingdom, EDF Energy organises regular meetings with local stakeholders (quarterly or three to four times a year depending on requirements) covering matters related to its business activities and impacts.

In 2012, EDF Energy opened four of its new visitor centres providing information on nuclear power, electricity generation and the company's

businesses through exhibitions, films and interactive displays. Three more centres are due to be opened in 2013.

Also, an independent study of the populations living close to generated sites showed some improvements since 2011, with a 3% rise in favourable opinions of nuclear power.

#### 6.6.3.2.2 Advice from independent panels

Several panels of experts provide their outside view to Group managers and companies: the Sustainable development panel at Group level, the Sustainable development, Scientific and Medical Councils at EDF in France, the Stakeholder Advisory Panel for EDF Energy, and the Social Committee at Edison.

The Group Sustainable development panel is a body for dialogue made of independent, global specialists in fields relating to the Group's activities or who represent the expectations and interests of civil society. It also includes, as automatic statutory members, the Chairmen of the Sustainable development and Scientific Councils, as well as the Chairman of EDF Energy's Stakeholder Advisory Panel (created in 2006). The Group Sustainable development panel provides advice and a critical assessment of the Group's commitments to sustainable development and their implementation. It meets once or twice per year with the Group's executives. In 2012, it met to discuss the theme of the EDF group's CO<sub>2</sub> strategy.

On 13 December 2012 a new body, the Sustainable development council, was formed with Group stakeholders by merging the previous Environmental and Social Councils. The members of this new Council are representatives of the issues associated with the sustainable development impact of the Group's installations and businesses. One of its main aims is to challenge managers and experts at EDF over the company's proposed options regarding sustainable development. The Council's first meeting, on the subject of energy poverty in France, took place on 13 December 2012.

The EDF Scientific Council is a consultative body that gives the company well-known senior scientists' opinions and advice on long and medium-term research activities. It meets three times a year to discuss specific themes, with detailed reports and recommendations to EDF's Chairman prepared before the meeting. The subjects covered in 2012 were the future of electricity transmission networks and the back-end of the nuclear fuel cycle. A special meeting was also held for the Council members and CEO to discuss subjects of their choice relating to changes in the company's environment, and scientific and technological developments.

The EDF Medical Council, composed of leading personalities from the medical world, and university professors with a particular interest in public health, biophysics, ethics, workplace and environmental health, epidemiology and toxicology, is a body for reflection and advice on a number of current topics connected to EDF's activities. Its Chairman is Prof. André Aurengo of the French Academy of Medicine. The Medical Council held three plenary meetings in 2012. The subjects discussed by the Council covered the essential health issues of current relevance – workplace health and environmental health. They included the health consequences of the Fukushima accident, plans for studies of infant leukaemia and residential exposure to magnetic fields, the reform of occupational medicine in France, the modalities of toxicological studies with the arrival of nano-materials, incorporation of recommendations on medical/professional monitoring of shift workers.

### 6.6.3.2.3 New orientation for the sustainable development partnership strategy

Each of the Group's partnership projects is now studied by the Partnership Committee. Sustainable development partnerships cover two aspects: biodiversity, and action against energy poverty and exclusion (see section 6.6.3.3.1 ("Contributing to action against energy poverty"))).

Against the two developments of reinforced regulations and the new environmental governance resulting from France's *Grenelle de l'Environnement* Round Table, biodiversity is a factor in sustaining and

developing EDF's activities both in and outside France. Application of the Group's Biodiversity Policy requires external expert input from organisations such as the Bird Protection League (*Ligue pour la Protection des Oiseaux*), the Coastal Protection Agency (*Conservatoire du Littoral*), French Nature Reserves (*Réserves Naturelles de France*), the French Committee of the International Union for Conservation of Nature, and the National Federation for Fishing in France (*Fédération nationale pour la pêche en France*). These longstanding partnerships have been established to foster sharing of technical knowledge and dialogue, support for the associations' projects and implementation of practical technical measures overseen by EDF's business lines and companies.

## Achievements in 2012

Bird Protection League ( <i>Ligue pour la Protection des Oiseaux</i> )	<ul style="list-style-type: none"> <li>■ EDF employees were involved in science programmes (the "Wetlands" inventories of migrating birds, the Observatory for garden birds).</li> <li>■ Assistance with management of the natural areas around 5 power plants: Aramon (fossil-fired), Penly (nuclear), Plobsheim, La Vanelle and Caradache (hydro).</li> <li>■ Support in organising the first Birdfair festival in Paimbœuf.</li> </ul>
Coastal Protection Agency ( <i>Conservatoire du Littoral</i> )	<ul style="list-style-type: none"> <li>■ The "Large Lakes" programme (symposium on the function of large lakes, working parties on definition of the environmental issues associated with large lakes, publication of a book on large French lakes).</li> <li>■ Restoration of a former industrial site around the Étang de Berre.</li> <li>■ Development of an environmentally-friendly footpath in the <i>Petite Camargue Alsacienne</i> nature reserve.</li> </ul>
French Nature Reserves ( <i>Réserves naturelles de France</i> )	<ul style="list-style-type: none"> <li>■ Restoration of plant species in the Pyrénées national park.</li> <li>■ Training for EDF employees in management plans for natural areas.</li> </ul>

Meanwhile, as the debate on the energy transition continues, the Sustainable Development division has continued its action with strategic partners in the form of think tanks and research chairs, for instance at Paris-Dauphine University. The partnership with the Nicolas Hulot foundation for nature and humans focused on support to the think tank founded by the association to consider the ecological transition, involving academics, researchers and top scientists with the aim of finding new ideas and proposals to govern the ecological transition, and making them known to the general public.

EDF still supports the *Institut du développement durable et des relations internationales*, a think tank set up by the Institut des études politiques, to develop its international dimension. EDF is providing support in three programmes that are closely related to its sustainable development activities and commitments: climate, biodiversity and the urban fabric. Through the Institute's Club Villes, EDF contributed its own experience to the "Emergent" project (under a French ecology ministry programme), which aims to analyse household energy consumption and identify the emergence of new behaviours in eco-districts.

Through the partnership with R20-Regions of Climate Action, a NGO covering 37 regions of countries from the north and south, businesses and financing institutions, EDF has continued the action for energy-efficient buildings begun with the East Morocco region in 2011: assistance with the regional energy efficient plan, formal definition of a charter of good practices for building professionals, preparation of training for public decision-makers.

### 6.6.3.2.4 Information on energy and sustainable development issues

In 2012 the Group's companies stepped up their programmes to raise awareness in the general public and young people of energy control and sustainable development issues, via internet or through events and conferences held in schools. These programmes are founded on partnerships with associations and the world of education.

## Principal actions of 2012

EDF (France)	<ul style="list-style-type: none"> <li>■ A public pavilion presenting energy issues at the 2012 London Olympic Games.</li> <li>■ Joint organisation of the exhibition entitled "Living in tomorrow, reinventing our habitats" with the <i>Cité des sciences et de l'industrie</i> museum in Paris, to raise awareness of campaigns for lower, efficient energy consumption.</li> <li>■ Distribution of 5,000 copies of a brochure ("What can you do with 1KWh?") at public events where EDF was a participant.</li> <li>■ Reinforcement of the educational content on EDF's website for young people (<a href="http://jeunes.edf.com">http://jeunes.edf.com</a>; more than 197,000 visits in 2012), with the online game Mission économie énergie, tests of environmentally friendly consumption, and the national launch of the Electis trophy for electricity and sustainable development, intended for secondary school students.</li> <li>■ 1,957 talks on sustainable development issues given in senior schools at the request of teachers, in connection with the school curricula.</li> <li>■ 2,900 talks on safety given in primary schools, including a section on saving energy in the home.</li> </ul>
EDF Energy (UK)	<ul style="list-style-type: none"> <li>■ Online educational programme The Pod, in partnership with the European Eco-School programme and the British NGO Eden Project, with the participation of 14,600 schools and 8 million children since its launch.</li> <li>■ Further involvement in the partnership with the Cheltenham Science Festival to promote careers in science to school students, and support the apprenticeship scheme.</li> <li>■ Support for the travelling Generation Science exhibition in Scotland.</li> </ul>
Edison (Italy)	<ul style="list-style-type: none"> <li>■ Continuation of the "Eco Generation. Schools is the climate's friend" campaign conducted with the NGO Legambiente in pilot schools (15 schools in 15 Italian towns), teaching pupils to assess their school's energy efficiency and helping them to look for ways to control energy consumption. It should develop into a permanent energy efficiency programme available to all schools, local authorities and the Ministry of Education.</li> <li>■ Participation in an interactive exhibition at Milan science and technology museum. 400 secondary school students took part in a "Science and Technology of Energy Generation" workshop, an interactive journey of exploration through energy generation and consumption.</li> <li>■ Sponsorship of the popular TV programme "Mr Green is coming", which teaches families how to cut electricity and gas consumption and provides advice on recycling.</li> </ul>
BE ZRt (Hungary)	<ul style="list-style-type: none"> <li>■ Information on energy issues for 1,000 young school pupils invited to visit the Hungarian company's co-generation plants.</li> </ul>
Groupe Electricité de Strasbourg (France)	<ul style="list-style-type: none"> <li>■ Advice on controlled use of resources and introduction of web pages on environmentally-friendly habits (<a href="http://ecocitoyens.es-energies.fr">http://ecocitoyens.es-energies.fr</a>).</li> </ul>
EDF Asia Pacific	<ul style="list-style-type: none"> <li>■ Publication of a book on the uses of electricity and reasonable use of natural resources, intended for children in rural areas and distributed in China, Thailand, Vietnam and Laos. This book is now part of school curricula.</li> </ul>

### 6.6.3.3 Societal affairs

The EDF group's societal policy is an integral part of the Group's sustainable development policy, in compliance with the UN Global Compact. Like the principles of the environmental and ethical policies, the principles of the societal policy are included in the corporate social responsibility (CSR) agreement.

The three main strategies of the societal policy are:

- to facilitate access to energy and energy eco-efficiency for vulnerable people;
- to contribute to the economic and social development of the areas covered by EDF;
- to contribute to the debate on sustainable development and EDF's activities, fostering local dialogue and knowledge of energy-related issues.

#### 6.6.3.3.1 Contributing to action against energy poverty

The issue of energy poverty is growing across Europe, although the associated definitions, public responses and energy operator involvement vary widely from one country to the next. In any case, it reflects the rise of economic poverty. According to the latest statistics in France, some 3.4 million households (13 %) were in a precarious situation regarding energy; in the United Kingdom the number is estimated at 5.5 million or 21% of the population<sup>1</sup>.

Against this background, the EDF group is reinforcing its involvement in action against energy poverty, going further than the regulatory obligations and working with Governments, local authorities, non-governmental organisations and other stakeholders to promote the most efficient possible energy use, in order to reduce consumption costs and develop country-specific solutions and programmes to provide support for vulnerable households.

<sup>1</sup>. Department of Energy and Climate Change: Annual report on fuel poverty statistics 2011.

In France, in addition to operations conducted as part of public programmes<sup>1</sup>, EDF's action has three focuses: help with paying bills, assistance to customers in difficulty, preventive action.

**Help with paying bills:** in 2012 EDF contributed €23 million to the Fonds de solidarité pour le logement (FSL) housing solidarity fund which helps customers in difficulty to clear their arrears; close to 190,000 households benefited have been helped by the fund. To avoid electricity supplies being cut off to any person defined as disadvantaged, EDF prolonged its "winter truce" period from 15 March (a legal requirement) to 1 April, and extended it to apply to all customers on social tariffs, not only households that received FSL aid the previous year.

**Assistance:** EDF increased the number of customers helped under its « Energy Assistance » system from 210,000 in 2011 to 324,000 in 2012, working with them to find appropriate solutions to their situations: deadline extensions, putting them in touch with social services, providing advice on making energy savings. EDF also became more involved in social mediation centres (Multiservice and Information points, National Agency for housing information) that bring it into closer contact with its customers, with opportunities to advise them about their rights and energy usage, and facilitate payment of their bills. In 2012, EDF was a partner in 170 mediation and contact points across France (150 in 2011).

EDF also supports campaigns to raise energy awareness with public social action centres, the charities *Secours catholique*, *Secours populaire*, SOS Familles/Emmaüs France, and Unis-cités, part of the Médiaterre programme.

In Corsica and French overseas departments and collectivities, for the last three years SEI has distributed low-energy lamp kits and multisocket standby savers (Packécors) to disadvantaged customers, to help them control their electricity consumption. In 2012, EDF gave out HydroEko domestic water regulation kits that can cut energy consumption by electric boilers by up to 10%: 70,000 were distributed on Réunion Island, 15,000 in French Guyana, 20,000 in Martinique, 20,000 in Guadeloupe and 16,000 in Corsica.

In Guadeloupe, EDF has developed a partnership with a mixed-economy company for development to promote efficient energy facilities in social housing, and joined forces with the family allowance agencies to offer the most modest beneficiaries €100 aid to purchase low-energy household appliances.

**Prevention:** in partnership with other organisations, EDF develops campaigns against energy poverty by improving the energy efficiency of the most financially insecure households. EDF is a major participant in the Habiter mieux (Better living) programme headed by the ANAH agency for home improvement subsidies, through an agreement signed in 2011. EDF is committed to a financial contribution that could reach €49 million, and participating in identifying the households concerned. This programme aims to modernize heating in 58,000 homes occupied by low-income families over the period 2011-2013. It was launched by the Government in 2010, to help the most modest householders owning the least energy-efficient homes by financing and overseeing insulation and heating renovation work that should cut energy consumption by at least 25%. 13,000 renovations were begun in 2012. The programme is currently for owner-occupiers but is change significantly in 2013 when it opens up to tenants, with reinforced action for collectively-owned buildings.

This commitment adds to EDF's voluntary contributions, for instance to the "Toits d'abord" operation in a partnership with the Fondation Abbé Pierre concluded in December 2012, with a 3-year target to build 2,000 homes for disadvantaged sections of the population. This follows the « 2,000 homes,

2,000 families operation » which since 2009 has built and renovated energy-efficient social housing for 2,025 very vulnerable families.

EDF is also developing the Montant de charges offer intended to improve home insulation and cut CO<sub>2</sub> emissions. This offer covers existing and new buildings for the social housing market. The aim is to assist financial backers undertaking renovation or building work for buildings that qualifies for energy savings certificates. After assessment, EDF and the project backers agree on a rehabilitation programme and performance target. 151,000 social housing units were renovated in this way in 2012.

In other Group companies:

- In addition to regulatory requirements and sponsorship operations, the Electricité de Strasbourg (ES) group's approach is based on the following commitments:
  - voluntary reinforced contribution to the Housing solidarity fund (€100,000), which in 2012 provided assistance to more than 1,000 customers in financial insecurity;
  - prevention of payment difficulties by training social actors and informing the populations concerned about how to manage consumption better;
  - personally-tailored assistance to each customer in difficulty, keeping the energy supply at the contractual level while the customer takes the necessary administrative action with the social services;
  - remittance of energy cheques via eight associations, under a convention to help customers in difficulty.
- ERDF works to detect customers in a situation of energy poverty and prevent cut-offs of electricity supplies regardless of the supplier concerned. In 2012, ERDF also signed two agreements with the National Committee of local systems and the national union of Multiservice and Information points so that households in difficulty can be better informed of the aid available to them.
- In the United Kingdom, the government's Warm Home Discount Regulations (April 2011) introduced an obligation incumbent for 4 years on energy suppliers with more than 250,000 customers, requiring them to provide support for customers at risk or in a situation of energy poverty. This regulation replaced the action previously taken under suppliers' voluntary commitments. The combined amount of the obligation was £250 million in 2011/2012, then £310 million by 2014. EDF Energy estimates its expenditure at approximately £26 million in the first year.

EDF Energy applied the "Energy Assist" tariff to 145,000 customers in 2012. This tariff was discontinued for new customers in July and replaced by discounts on electricity bills under the "Warm House Discount" plan. 136,800 discounts of £120 were given in winter 2011/2012, and EDF Energy estimates that 190,000 discounts will be given in winter 2012/2013.

EDF Energy automatically applies the cheapest tariff on the market to all senior citizens identified by the Department of Work and Pensions. In April 2012, the company, which offers some of the cheapest standard prices for gas and electricity, launched "Blue+Price Promise", a package that informs all UK customers of the possibility of saving more than one pound a week on standard consumption, regardless of the supplier used. Every customer subscribing to this offer benefits from a frozen tariff until September 2013, and is not charged switching costs if they decide to change suppliers.

1. EDF offers social tariffs in France for electricity (it is the only operator authorised to apply the Basic Necessity tariff) and natural gas (Special Solidarity tariff): it receives compensation for these tariffs through the Contribution to the Public Electricity Service (CSPE) and the Contribution to the special solidarity tariff for gas (CTSSG) respectively. Following a change in the regulations in March 2012 simplifying the terms for access to social energy tariffs and allowing qualifying persons identified as EDF customers to apply for those tariffs, more than one million households in mainland France, Corsica and the French overseas territories were able to benefit from the Basic Necessity tariff in 2012 (635,000 in 2011).



The UK government's "Community Energy Saving Programme" (CESP) ended in 2012. It lasted three years and its objective was to upgrade home insulation in underprivileged areas (concerning over 100,000 homes). By the end of 2012, EDF Energy had contributed £89 million to help 30,000 very vulnerable households. The CESP has now been replaced by a new obligation for suppliers (ECO), which incorporates the objectives of the CERT, a previous government programme to reduce CO<sub>2</sub> emissions. ECO is broader, and targets total renovation of residential buildings (full insulation plus heating), setting suppliers targets for reducing heating costs and CO<sub>2</sub> emissions for low-income families. EDF Energy's obligations for the period January 2013 – March 2015 are to save £500 million on heating and cut CO<sub>2</sub> emissions by 3.5 million tonnes.

EDF Energy continued its donations to the independent charitable trust "Trust Fund" (£1.9 million in 2012 for 2,493 households), which allocates aid to help families in serious debt after economic difficulties (serious illnesses, bereavement) and also gives personal advice on managing debt to local populations in the areas where it has establishments, as well as its support for the London Warm Zone, contributing to a study of 10,000 homes in the most disadvantaged areas of London, to identify possible beneficiaries of grants for more efficient insulation and heating.

It also entered into new partnerships:

- funding the National Energy Action to increase knowledge of energy efficiency and energy poverty, not only in staff who are in direct contact with low-income families, but also the volunteers working for credit cooperatives;
- funding the Impetus Consulting initiative to help small social housing associations to support tenants experiencing energy poverty.

- In Poland, Group companies that produce electricity and heat but have no dealings with residential customers are pursuing the agreements signed with towns, distributors and NGOs to help fragile populations, either by direct financial aid and energy cheques (EC Zielona Góra, Kogeneracja, EDF Wybrzeze, EDF Torun) or by supplying heat free of charge to organisations and establishments associated with local authorities (EDF Krakow).
- In Hungary, in February 2012, EDF Démász set up an aid programme, in a partnership with the Hungarian branch of the Order of Malta, intended for the most vulnerable families who have unpaid energy bills.

### 6.6.3.2 Contributing to economic and social development of the areas covered by EDF

The EDF group wishes to live in harmony with the areas where it does business, and accordingly the impacts of its facilities and activities on local areas are identified and addressed. Opportunities for long-term contribution to economic and social development in the local area are sought from the outset, such that EDF makes a particular contribution to integration of vulnerable people. EDF is proud to be an actor in local social cohesion.

#### Contributing to local development and integration of vulnerable people

EDF is particularly attentive to its contribution to local economic development, and gives priority to local employment as far as possible

## Economic development and local job creation

### Principal actions of 2012

In France	<ul style="list-style-type: none"> <li>■ Launch in 2012 of the "One river, one area for development" programme to provide expertise, support and funding for local actors and contribute to value and job creation, by developing local skills together with beneficiaries, and also by encouraging the emergence of innovative projects and economic activities of the future relating to water, energy and the environment. The first economic development agency opened at Rodez in April 2012, for development in the Lot, Truyère and Tarn valleys, with an annual budget of €3 million.</li> <li>■ More than 7,000 jobs were created directly and indirectly by the development of 1.5 GW in offshore wind power capacity in France, in association with Alstom.</li> <li>■ Promotion of inclusive purchases through different channels: <ul style="list-style-type: none"> <li>■ a three-year agreement for inclusion of disabled workers (in the section on purchases from the protected sector and organisations where the majority of the workforce is disabled – the annual objective of €6 million was exceeded as €7.6 million of purchases were made from these protected and special sectors for EDF in 2012);</li> <li>■ socially responsible subcontracting agreement: EDF is stepping up purchases from organisations that foster social integration through employment (more than €1.5 million in 2012).</li> </ul> </li> </ul>
In Morocco	<ul style="list-style-type: none"> <li>■ Commitment by EDF Énergies Nouvelles and its partners Mitsui and Alstom to use Moroccan firms for at least 30% of the construction work of the Taza wind power project.</li> </ul>

#### Social integration of vulnerable people and young people

In jobseeking support in France, by the end of 2012 EDF and ERDF had exceeded their objective of offering 1,000 disadvantaged unemployed people the opportunity to gain experience and qualifications through block-release training in a business line "with a future".

## Principal actions of 2012

### In France

- EDF has special programmes to train young people, particularly those finding it difficult to join work-study schemes. Examples are its Trait d'Union campaign set up by the Sales Division in the Paris region and the south of France, which actively helps young people to gain work and qualifications in customer service positions, Tremplin in south-west France and Académie Bleu Ciel in the north-west. In 2012, 200 people benefited from these schemes.
- In Flamanville, almost 490 jobless people, identified under criteria proposed by EDF and adapted by employment workers at local job centres, were hired to work through an organisation that fosters social integration via employment.

### Contributing to local cohesion

On 28 September 2010, the French government and nine major public service operators including EDF signed a partnership agreement for more public service entitled “+ de services”, designed to develop access to a range of services for France's rural populations. The aim of this partnership is to provide inhabitants of rural areas with a range of services in a single place. 60 new contact offices are to be opened with EDF participation, in addition to the sites already in existence. This experiment is being conducted in 22 areas of France and covers new Multiservice and Information points, and public service points mostly hosted by local authorities. The purpose is to simplify access for all types of user, by collaboration between signatories to the partnership and complementarities between traditional services, new technologies and physical multi-service offices. 21 of the 22 area contracts had been signed by the end of 2012, and the remaining contract for the Cher area is due to be signed in early 2013.

#### 6.6.3.3.3 Subcontracting and responsible purchasing

EDF's socially responsible subcontracting agreement signed in October 2006 is one expression of the Group's CSR agreement, and has been renewed indefinitely, highlighting the intent to maintain industrial and service collaboration in the long term. This approach enables service providers to reinforce their activities and extend their capacity for sustainable development, rather than merely signing short-term or one-off contracts.

For subcontractors and their employees this agreement is a guarantee that their work for EDF will take place in optimum employment, qualification, working and health and safety conditions and in full knowledge of the risks inherent to the activities exercised. The agreement's monitoring committee was set up in 2007. It holds three meetings a year, attended by signatories and representatives of EDF's various businesses, to examine progress on the action taken under the agreement.

Several types of action have been implemented across all EDF's business lines, for example:

- improving reception and working conditions for subcontractors on the nuclear and fossil-fired generation sites;
- concerted action with outsourcers in the nuclear business, to increase the sector's appeal and develop appropriate training;
- gaining the social responsibility label for the “integrated customer service relations” category, under the new and substantially more demanding label system;
- a sustainable development charter between EDF and its suppliers. Environmental, social and corporate criteria are also incorporated into purchasing strategies (assessment of supplier skills and feedback), starting from the initial preparation of specifications developed in close collaboration with the business activities requiring the outsourcers' services. The charter is integrated into the general terms and conditions

and must be signed by all suppliers doing business with EDF. It sets out reciprocal commitments including:

- conduction of “sustainable development/corporate social responsibility” audits at the premises of suppliers and service providers to ensure these commitments are respected,
- integration of social responsibility criteria in forming the panel of suppliers and collecting feedback after completion of services,
- inclusion of modules on socially responsible subcontracting in training for purchasers, sponsors and actors in the purchasing process.

In 2012 as in 2011, a programme of 57 sustainable development audits was executed at EDF suppliers established all over the world, based on the standards contained in SA 8000 and ISO 14001 and a criticality analysis. Detailed analysis of the audits conducted in 2011 shows that 93% of audits reported a rating of “satisfactory” or “acceptable with comments”.

The 2012 audits are currently under analysis.

#### 6.6.3.3.4 Consumer health and safety

In France, EDF offers residential customers an electricity safety survey service proposed in partnership with the Consuel<sup>1</sup> (electricity users' safety inspectors). This service is designed to enhance the safety of interior electricity installations: a qualified technician inspector can come to customers' homes to look at the key points of their electricity fittings in all accessible rooms, checking that they meet minimum safety requirements under the UTE XP C 16-600 “State of electricity fittings in residential property” standard. A report of any problems noted and the associated risks is remitted to the customer, along with general advice on remedial action which should ideally be carried out by a professional electrician. 1,776 electricity safety surveys were sold in 2012.

## 6.6.4 Reporting

The commitment of transparency to stakeholders is put into practice through reporting action and non-financial ratings. EDF publishes an annual sustainable development report on its website analysing the environmental, societal and social impacts of Group companies' industrial and commercial businesses.

### Non-financial reporting

This reporting uses the non-financial indicators defined in the Global Reporting Initiative. It complies with France's NRE law and article 225 of the “Grenelle 2” law (implementing decree of 24 April 2012) and is consistent with the international commitments of the Global Compact to which the EDF group was one of the earliest signatories.

1. The CONSUEL electricity users' safety committee (Comité National pour la Sécurité des usagers de l'électricité) is a public interest body in France that certifies the conformity of electric fittings in new or entirely-renovated homes, after inspection where necessary.

The form and content of the Group's non-financial reporting are constantly reviewed for improvement: reinforcing reporting processes for qualitative information; publishing a schema mapping relations between Group companies and their stakeholders; publishing supplier audits; comparing EDF's performance with others in the sector; taking on board stakeholder views (safety authorities, service providers, customers); simplifying access to information for internet users; including educational graphics (illustrating the environmental, societal and social issues related to Group activities); and publishing assessments by non-financial ratings agencies.

The Group has also begun a progressive process to have the quality of these non-financial indicators verified by the Statutory Auditors.

For 2012, the Statutory Auditors issued a report expressing "reasonable assurance" on the "CO<sub>2</sub> emissions (for electricity and heat generation) and "total workforce at year-end" divided by gender and age indicators and "moderate assurance" on a selection of environmental and social indicators.

The sustainable development information published by the Group is based on evaluations by ratings agencies or non-financial analyst departments acting on behalf of investors.

A summary of environmental and social indicators is available in appendix E.

## CSR performance ratings

In March 2012, EDF has been admitted to the FTSE4Good Policy Committee at the prestigious FTSE4Good index following an in-depth independent analysis and based on social, environmental and nuclear safety criteria. The EDF Group is now one of five nuclear operators globally meeting the stringent criteria developed and overseen by the FTSE4Good Policy Committee.

Since 2005, EDF has been included in the ASPI index, an "ethical" index comprising 120 firms assessed on the basis of their sustainable development performance by the French CSR rating agency Vigeo. In 2012 EDF was also a member of the Vigeo France 20, Vigeo Europe 120 and Video World 120 indexes. It was given an overall score of 55 out of 100 in 2012.

EDF is also participating in the Carbon Disclosure Project (CDP).

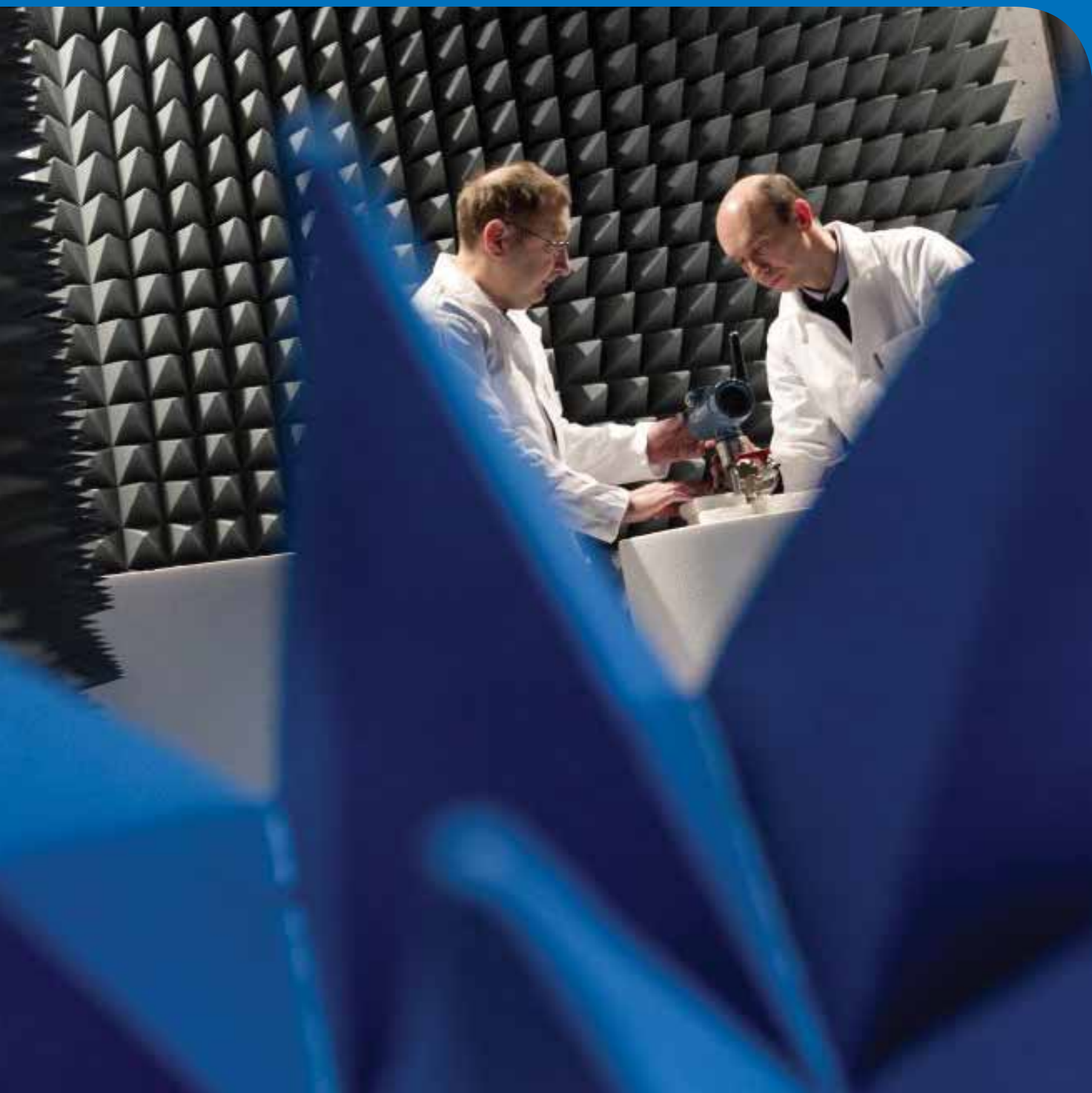
In 2012, 81% (405) of Global 500 companies answered the CDP questionnaire; in France, 97% of CAC40 companies responded, showing the significant commitment by the largest French firms to transparency and reducing CO<sub>2</sub> emissions.

EDF's transparency score was 87 in 2012 (+25 points compared to 2011) and its performance was graded B.

The companies of the EDF group prepare their non-financial reporting in the form of an annual sustainable development report (Edison in Italy, ERDF, Electricité de Strasbourg), by including sustainable development issues in their annual report (UTE Norte Fluminense in Brazil), or by publishing commitments and indicators on their website (EDF Energy in the United Kingdom, CENG in the United States).







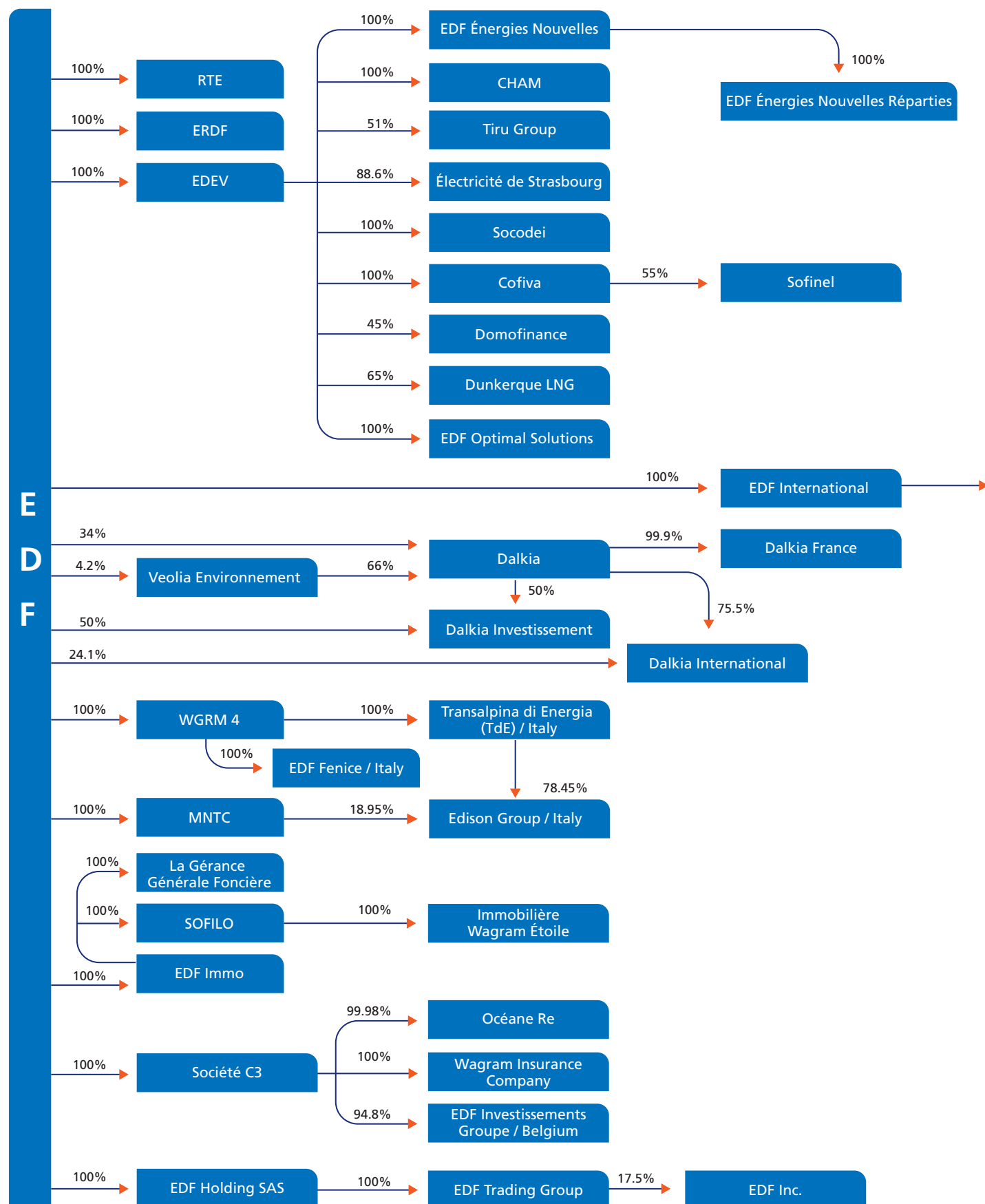
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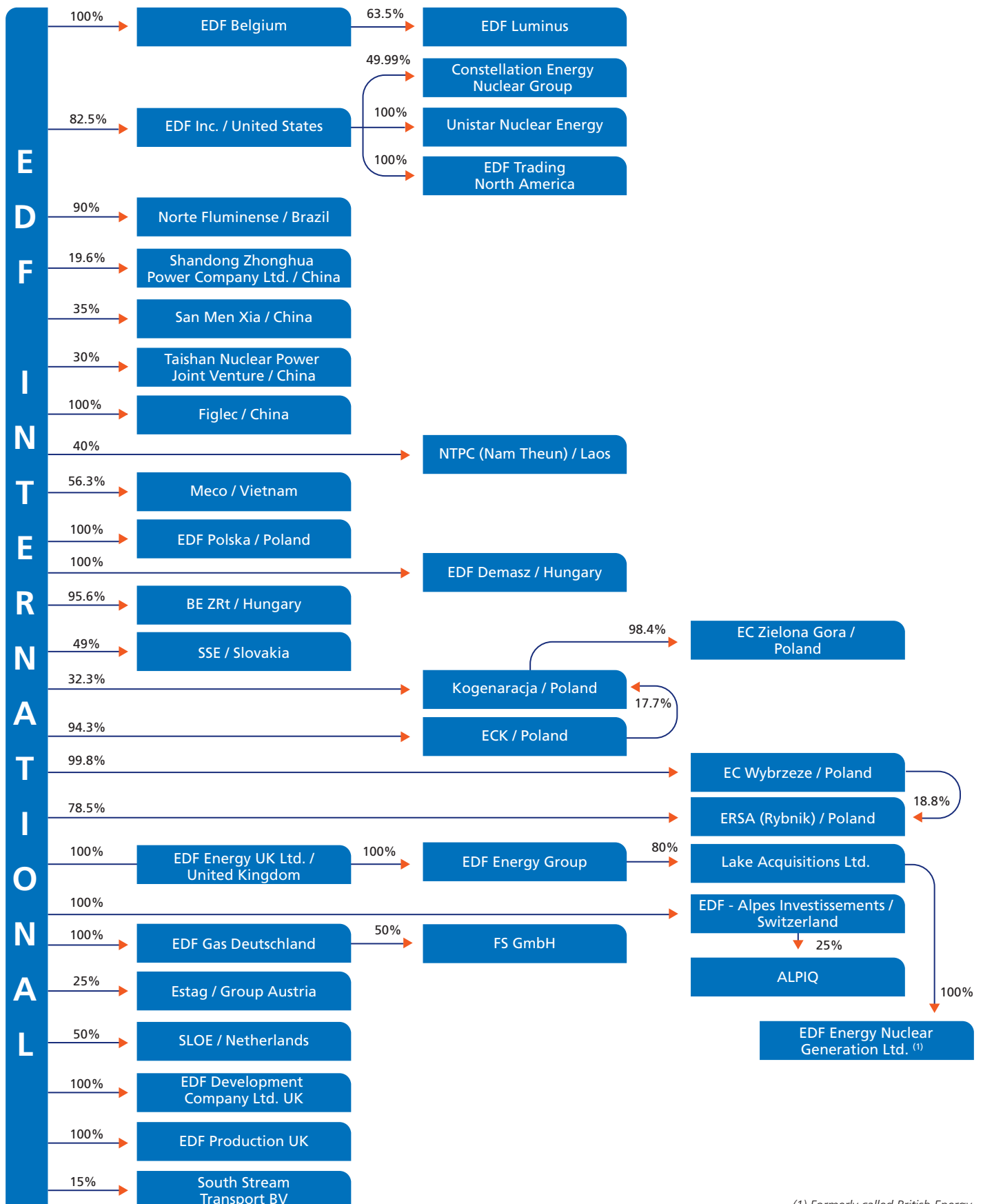
## Organisational charts

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# 7 | Organisational charts

A simplified organisational chart for the Group, as of 31 December 2012, is presented below. The percentages for each entity represent the ownership interest in capital.





(1) Formerly called British Energy.



All the companies within the Group's scope of consolidation are indicated in note 52 to the consolidated financial statements for the year ended 31 December 2012

## Information on subsidiaries

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The presentation of the activities of the main subsidiaries of the Group, the description of their recent acquisitions, and their economic weighting in the Group appears in section 6.2 ("Presentation of the EDF Group's business in France") and 6.3 ("Presentation of the EDF group's international business")

of this reference document. In addition, note 6 to the consolidated financial statements for the year ended 31 December 2012, provides further financial information on the Group companies presented by operational sectors.

## Offices held by EDF executives

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Offices held by EDF executives within the Group's subsidiaries are indicated in section 14.1.2 ("Personal information on members of the Board of Directors").

## Intra-group contracts

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### Cash pooling agreements entered into between EDF and its subsidiaries

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The cash pooling set up by EDF centralises all the cash positions of the subsidiaries and the Group's liquidity can be optimised. This cash pooling consists in grouping all the cash balances of the subsidiaries at the level of the parent company. It includes certain French and international subsidiaries. It does not include RTE.

The system for cash pooling in place for the companies of the EDF group is defined under cash agreements. Bilateral agreements between EDF and each subsidiary define the specific conditions for each arrangement, such as remuneration of balances, etc.

On the international level, subsidiaries participating in the system enter into a framework agreement, whereby EDF serves as the Cash Center.

EDF also centralises all the currency flows from its French subsidiaries.

by EDF International in 2012 came to €841 million. EDF received a total of 2,476 million euros in dividends in 2012 from its consolidated subsidiaries.

Other financial flows between EDF and its subsidiaries are loans, asset transfers and guarantees made by the parent company of the Group for the benefit of certain subsidiaries.

In the context of the Group's financing centralization policy decided on in 2006, EDF centralizes the financing of its subsidiaries. In this context, in 2007 EDF created a subsidiary located in Belgium, EDF Investissements Groupe, which centralizes medium and long term intra group financing.

With regard to financial flows related to fees paid by subsidiaries, contracts for supply of intragroup services were concluded with the main subsidiaries of the scope of consolidation in 2012. EDF may also be required to provide specific services to certain subsidiaries or entities outside the Group. In addition, following the works of branding EDF, the Company set up licensing agreements with subsidiaries using the EDF brand.

A description of the financial flows related to contracts between EDF and its subsidiaries is set forth in chapter 19 ("Related party transactions") hereafter.

### Financial flows between EDF and its subsidiaries

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In addition to the financial flows relating to the cash pooling agreements mentioned above, financial flows between EDF and its subsidiaries are also related to distributions of dividends within the Group. A substantial portion of the dividends paid by some of the Group's subsidiaries (including EDF Energy) is exclusively paid to EDF International. Total dividends received



Photo credit © EDF – Laurent Vautrin

# 8 Property, plant and equipment

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## 8.1 Service sector real estate assets

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EDF's Real Estate Division, which includes the real estate department and its associated subsidiaries, operates in France as the Group's real estate provider by managing and optimising a real estate portfolio of nearly 4.5 million square meters of service premises, approximately 73% of which is owned outright by the Group and 27% is leased from third parties (leases and concessions).

The Real Estate Division is in charge of real estate asset management, lease management, the technical operation of building as well as the operation-maintenance of the facilities and the services provided to occupants, by offering areas through a sub-lease system for Group entities and units. By taking leases from third parties, the Real Estate Division made commitments for EDF amounting to €989 million for the period from 2013-2026.

## 8.2 Employer participation in the construction effort

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Each year, EDF is subject to an obligation to participate in the French construction effort program. Its contribution is 0.45% of its total payroll, which represented approximately €16.2 million for 2012 (€15.6 million for 2011).

In exchange for this payment, EDF's employees benefit from services intended to facilitate their residential mobility: assistance with renting, assistance with home purchase, assistance with mobility, advice on financing.

## 8.3 Subsidised home ownership loans

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As part of its social policy, EDF assists its employees to purchase their primary residence. Thanks to a partnership concluded with Crédit Immobilier de France ("CIF"), the bank manages the production, financing, and management of loans to the company's employees. EDF compensates the CIF for the difference between the subsidised rate at which CIF grants loans to EDF employees and the rate resulting from the bank survey conducted in 2005 on the basis of which the CIF was chosen.

As of 31 December 2012, the residual non-securitised balance for personal residence mortgages was €5.3 million on EDF's balance sheet (€6.0 million as of 31 December 2011).



# 9

## Operating and financial review

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## 9.1 Key figures

Pursuant to European regulation 1606/2002 of 19 July 2002 on the adoption of international accounting standards, the EDF group's consolidated financial statements at 31 December 2012 are prepared under the international accounting standards published by the IASB and approved by the European Union for application at 31 December 2012. These international standards are IAS (International Accounting Standards), IFRS (International Financial Reporting Standards), and interpretations issued by the SIC and IFRIC.

The Group's accounting policies are presented in note 1 to the consolidated financial statements at 31 December 2012.

The figures presented in this document are taken from the EDF group's consolidated financial statements at 31 December 2012.

The comparative figures for 2011 have been restated for the impact of the change in accounting method for actuarial gains and losses on post-employment benefits under the options offered by IAS 19 (see note 2 to the consolidated financial statements). In the tables in this management report, these figures are reported as "2011 restated".

One notable event of 2012 was the takeover of the Edison group on 24 May 2012 (for details of the operation see section 9.2.2.1.1). Edison is fully consolidated as of that date, since the EDF group holds 97.40% of the capital and 99.48% of the voting rights in Edison.

The Group's key figures for 2012 are shown in the following table. Variations in value and percentage are calculated with reference to the restated 2011 figures.

### Extract from the consolidated income statements

(in millions of Euros)	2012	2011 restated	Variation	Variation (%)	Organic growth (%)
Sales	72,729	65,307	7,422	+11.4	+5.8
Operating profit before depreciation and amortisation (EBITDA)	16,084	14,939	1,145	+7.7	+4.6
Operating profit (EBIT)	8,245	8,452	(207)	-2.4	
Income before taxes of consolidated companies	4,883	4,672	211	+4.5	
EDF net income	3,316	3,148	168	+5.3	
Net income excluding non-recurring items <sup>(1)</sup>	4,216	3,607	609	+16.9	

(1) Net income excluding non-recurring items is not defined by IFRS, and is not directly visible in the consolidated income statements. It corresponds to the Group's share of net income excluding non-recurring items and the net change in fair value on Energy and Commodity derivatives, excluding trading activities, net of tax (see section 9.3.9).

### Extract from the consolidated balance sheets

(in millions of Euros)	31 December 2012	31 December 2011 restated
Non-current assets	140,279	128,318
Inventories and trade receivables	36,710	34,489
Other assets	55,328	52,287
Cash and cash equivalents, other liquid assets, loans to RTE and joint ventures <sup>(1)</sup>	17,560	16,184
Assets held for sale (excluding cash)	241	684
<b>TOTAL ASSETS</b>	<b>250,118</b>	<b>231,962</b>
Equity (EDF share)	25,858	28,483
Non-controlling interests	4,854	4,189
Special concession liabilities	42,551	41,769
Provisions	65,582	58,018
Loans and other financial liabilities <sup>(2)</sup>	59,135	49,469
Other liabilities	52,089	49,897
Liabilities related to assets classified as held for sale (excluding loans and other financial liabilities)	49	137
<b>TOTAL EQUITY AND LIABILITIES</b>	<b>250,118</b>	<b>231,962</b>

(1) Including cash and cash equivalents of discontinued operations.

(2) Including hedging derivatives and the financial liabilities of discontinued operations.

## Operating cash flow

(in millions of Euros)	2012	2011 restated	Variation	Variation (%)
Operating cash flow <sup>(1)</sup>	12,314	10,281	2,033	+ 19.8

(1) Operating cash flow is not an aggregate defined by IFRS as a measure of financial performance, and is not necessarily comparable with indicators of the same name reported by other companies. This indicator, also known as Funds From Operations (FFO), is equivalent to net cash flow from operating activities excluding changes in working capital, adjusted for the impact of non-recurring items, less net financial expenses disbursed and income taxes paid.

## Details of net indebtedness

(in millions of Euros)	31 December 2012	31 December 2011	Variation	Variation (%)
Loans and financial liabilities	59,932	50,034	9,898	+19.8
Derivatives used to hedge liabilities	(797)	(834)	37	-4.4
Cash and cash equivalents	(5,874)	(5,743)	(131)	+2.3
Liquid assets	(10,289)	(9,024)	(1,265)	+14.0
Loans to RTE and joint ventures	(1,397)	(1,400)	3	-0.2
Net indebtedness of discontinued operations	-	252	(252)	
<b>NET INDEBTEDNESS <sup>(1)</sup></b>	<b>41,575</b>	<b>33,285</b>	<b>8,290</b>	<b>+24.9</b>

(1) Net indebtedness is not defined in the accounting standards and is not directly visible in the consolidated balance sheets. It comprises total loans and financial liabilities, less cash and cash equivalents and liquid assets. Liquid assets are financial assets consisting of funds or securities with initial maturity of over three months that are readily convertible into cash regardless of their maturity and are managed according to a liquidity-oriented policy. The definition of net indebtedness was revised in 2012 and now includes the Group's loans to RTE and joint ventures.

## 9.2 Economic environment and significant events of 2012

### 9.2.1 Economic environment

#### 9.2.1.1 Trends in market prices for electricity and the principal energy sources

European energy prices were affected in 2012 by the fall in prices for coal and CO<sub>2</sub> emission rights, and a substantial rise in energy generation from renewable sources in Germany.

##### 9.2.1.1.1 Spot electricity prices in France, the United Kingdom, Italy and Germany<sup>1</sup>

	France	United Kingdom	Italy	Germany
Average baseload price for 2012 (€/MWh)	46.9	55.2	75.5	42.6
Variation in average baseload prices, 2012/2011	-4.1%	+0.3%	+4.6%	-16.6%
Average peakload price for 2012 (€/MWh)	59.4	63.3	85.2	53.4
Variation in average peakload prices 2012/2011	-2.1%	+2.9%	+3.5%	-12.6%

The comments below concern baseload prices.

In **France**, spot electricity prices stood at an average €46.9/MWh, €2.0 MWh/h lower than in 2011. The decline is partly attributable to the significant fall

in the price of CO<sub>2</sub> emission rights and coal. The increase in imports from Germany, where there was a substantial output of cheap energy from renewable sources, also drive prices downwards.

1. France and Germany: Average previous day EPEXSPOT price for same-day delivery;  
United Kingdom: Average previous day EDF Trading OTC price for same-day delivery;  
Italy: Average previous day GME price for same-day delivery.

Prices also showed much higher volatility this year. The spell of cold weather in February caused significant peaks in prices, while the mild temperatures and high output of harnessable energy<sup>1</sup> in the last third of December led to low prices at the end of the year as the supply-demand balance was extremely relaxed, and negative prices were even observed at certain hours. Given this context and the state of its fleet, the EDF group was a purchaser in all negative price hours.

In **Germany**, prices fell markedly to an average €42.6/MWh, down by €8.5 MWh from 2011. Even more than in France, this change is explained by the lower prices for coal and CO<sub>2</sub> emission rights, and most importantly the substantial growth in wind power and photovoltaic power generation,

both extensively subsidised by end-users. Consequently, German prices were lower than French prices during most hours of the year.

In the **United Kingdom**, spot electricity prices were stable overall compared to 2011 despite the rise in spot gas prices, at an average €55.2/MWh. The UK's energy mix generally includes a large contribution from Combined Cycle Gas (CCG) plants, but the downturn in prices for coal and CO<sub>2</sub> emission rights resulted in more extensive use of coal-fired plants, to the detriment of CCG plants.

In **Italy**, spot electricity prices rose by 4.6%, principally due to the increase in Italian gas prices.

## 9.2.1.1.2 Forward electricity prices in France, the United Kingdom, Italy and Germany<sup>2</sup>

	France	United Kingdom	Italy	Germany
Average baseload price for 2012 (€/MWh)	50.6	61.6	73.3	49.3
Variation in average baseload prices, 2012/2011	-9.6%	-1.1%	-1.2%	-12.0%
Forward baseload price at 21 December 2012	47.3	63.2	70.4	45.1
Average peakload price for 2012 (€/MWh)	64.0	69.9	80.8	60.9
Variation in average peakload prices, 2012/2011	-9.2%	-0.6%	-3.7%	-11.7%
Forward peakload price at 21 December 2012	60.3	71.5	78.1	57.0

The comments below concern baseload prices.

European annual contract baseload prices were on average lower than in 2011, due to downward price trends for CO<sub>2</sub> emission rights and coal.

In **France**, the 2012 annual contract baseload price amounted to an average €50.6/MWh, down by 9.6% from 2011. The main factor in this decrease was the lower prices for coal and CO<sub>2</sub> emission rights, and anticipation of moderate consumption levels.

In **Germany**, the baseload annual contract price registered a bigger decline than the French annual contract, to €49.3/MWh. As well as the change in fuel prices, forward contract prices were influenced by the increasing importance in the energy mix of renewable energies, which have zero variable operating costs and are indirectly borne by consumers, thus bringing prices down from the spring onwards. 2012 German annual contract prices were higher than French prices in the first two months of the year, following the trend of the last six months of 2011 after Germany's political decision to withdraw from nuclear power. High photovoltaic power output in March reversed the trend, and the German contract price returned to a lower level than French prices.

In the **United Kingdom**, the 2012 April Ahead contract baseload price, running from 1 April Y+1 to 31 March Y+2, stood at €61.6 MWh, a 1.1% decline caused by falling forward gas prices. However, the decrease in electricity prices was limited by a change in CO<sub>2</sub> regulations: from 1 April 2013 the cost of electricity generation will include a share for CO<sub>2</sub> emissions specific to the UK. This will raise prices by approximately €3/MWh and is already included in the 2013 April Ahead price.

In **Italy**, the baseload annual contract stood at €73.3/MWh, down slightly from 2011, largely due to shrinking demand as a result of the crisis.

## 9.2.1.1.3 CO<sub>2</sub> emission rights prices<sup>3</sup>

During 2012, the price of CO<sub>2</sub> emission rights under Phase II (2008-2012) stood at an average €7.5/t for delivery in December 2012, down by €5.8/t from 2011. The price per tonne for CO<sub>2</sub> remained between €6 and €9 throughout the year.

Movements in CO<sub>2</sub> emission rights prices mainly reflected European Commission decisions made to regulate the excess supply of rights, and the economic outlook in Europe. The first negotiations to absorb excess emissions rights, and the wave of cold weather in February, kept the price at €9.5/t at the end of the first quarter. But negotiations aiming to raise prices were unsuccessful, largely because they were blocked by Eastern countries, and as a result the price returned to €6/t. In July, the Commission began further negotiations, this time with the sole aim of changing the timetable for emission rights auctions over the period 2013-2020, so as to limit inflows of rights onto the market in the short term and support prices. A deferral was proposed in November 2012 that would only apply to 900 million tonnes and would not come into force until 2013 after validation by European Commission bodies. These two very cautious decisions were considered disappointing by market actors, as reflected in a continuing decline in CO<sub>2</sub> emission rights prices.

1. Harnessable power is power generated by any technology affected by weather conditions: wind power, hydropower, and photovoltaic power.

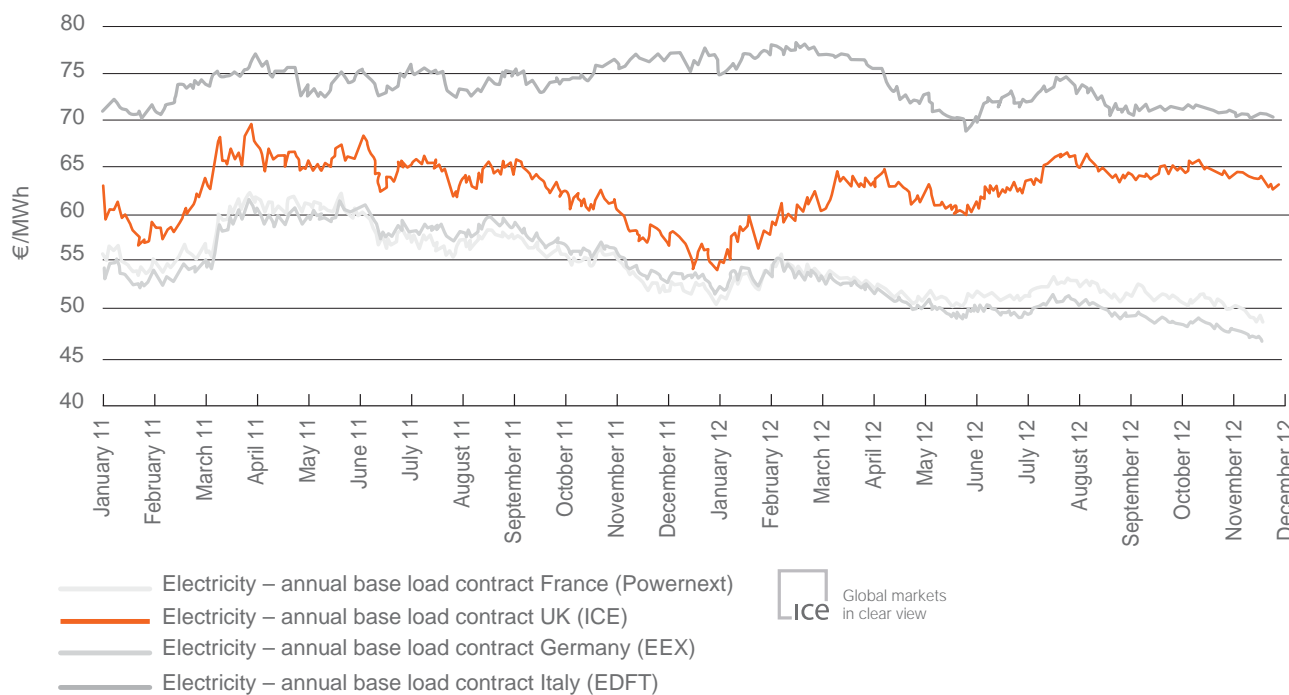
2. France and Germany: Average year-ahead EPD price; the last quotations of 2012 were issued on 21 December.

Italy: average year-ahead EDFT price.

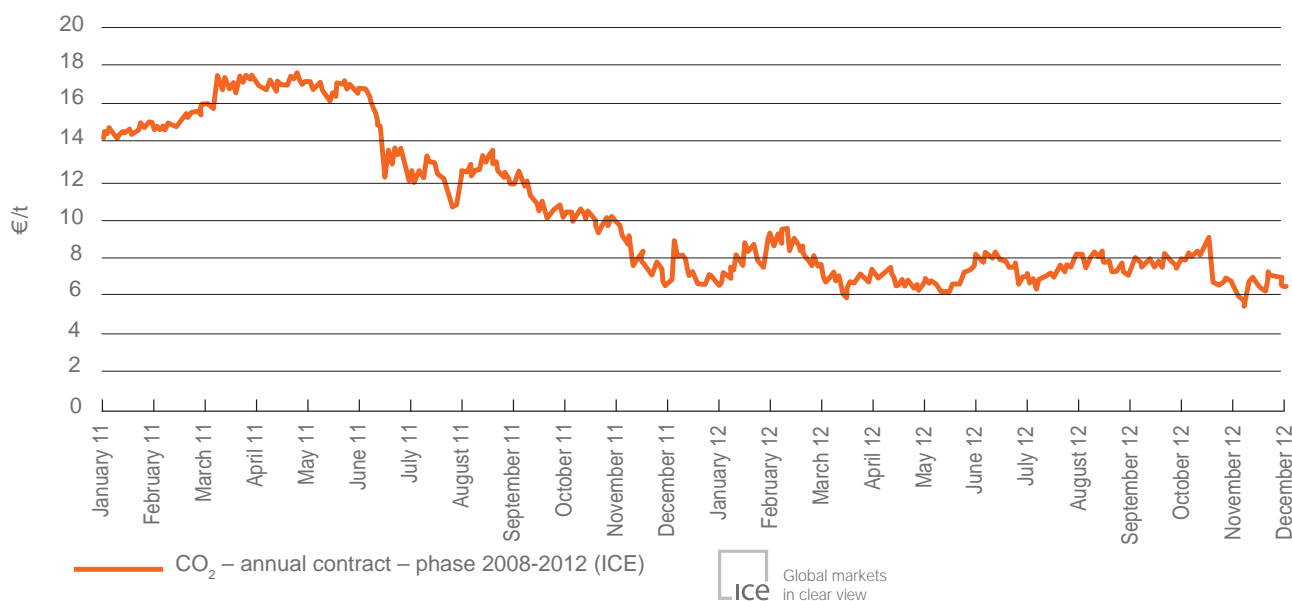
United Kingdom: Average ICE annual contract prices, April 2012 then April 2013 (in the UK, annual contract deliveries take place from 1 April to 31 March).

3. Average ICE prices for the annual contract, Phase II (2008-2012).

## Forward electricity prices in France, the United Kingdom, Italy and Germany



## CO<sub>2</sub> emission rights prices (Phase II, 2008-2012)





## 9.2.1.1.4 Fossil fuel prices<sup>1</sup>

	Coal (\$/t)	Oil (\$/bl)	Natural gas (p/th)
Average price for 2012	103.1	111.7	64.6
Average price variation, 2012/2011	- 16.7%	+ 0,6%	- 2.7%
Highest price in 2012	118.2	126.2	70.0
Lowest price in 2012	92.7	89.2	59.5
Closing price, 2011	111.9	107.4	63.1
Closing price, 2012	94.1	111.1	65.8

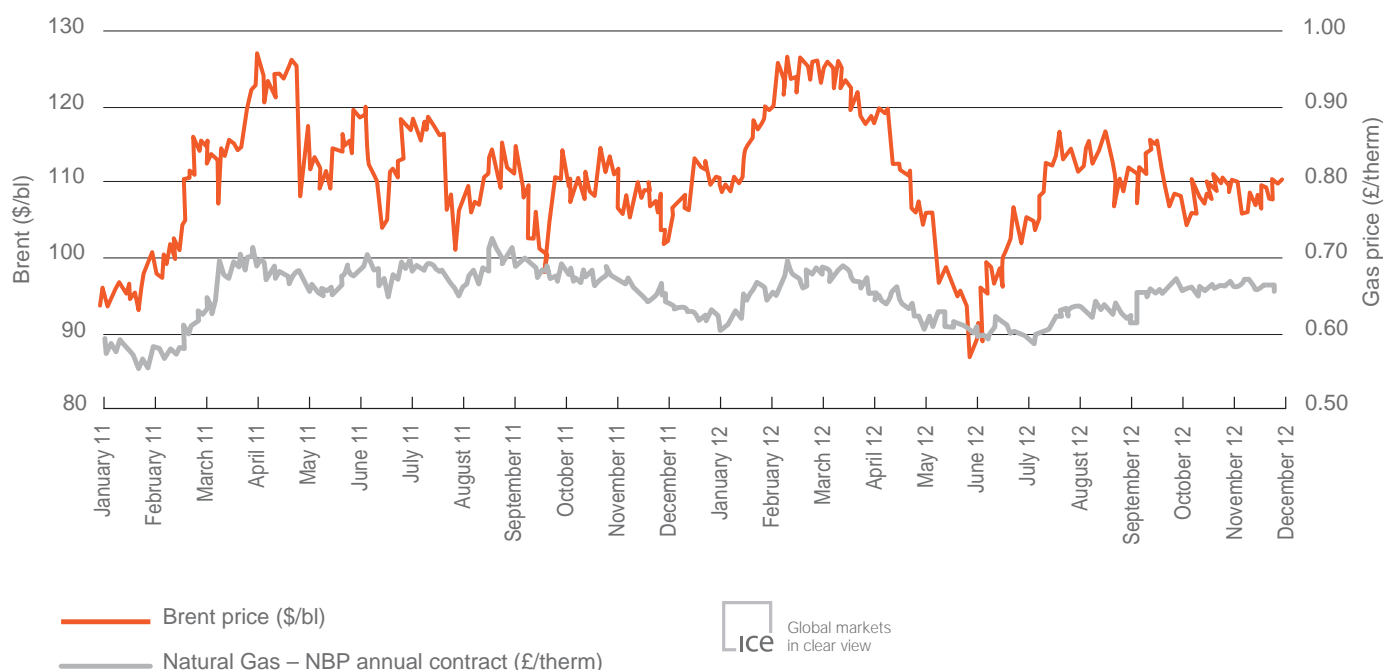
For **coal**, the short term supply-demand balance was very relaxed, largely because of cheap coal imports from Colombia, the US and Russia, and low demand from electricity operators. This situation, combined with a gloomy economic outlook in Europe, was reflected in a fall of nearly 17% in average forward coal prices in Europe between 2011 and 2012. The price per tonne of coal for delivery in 2013 averaged \$103.1/t in 2012 and ended the year below \$100.

The average European crude **oil** price was comparable to the 2011 level at close to \$112/bl, although it showed great volatility over the year. The price per barrel began the year on an upward trend due to fears over supplies, given the threat of potential conflict with Iran, problems in South Sudan and the strike at oil sites in Yemen. In the second quarter, the price per barrel dropped sharply, broadly cancelling out the rise of the first quarter. This drop was mainly driven by concerns about demand following publication of

consistently poor macro-economic indicators for Europe, the United States and China. In the summer, the price per barrel increased again following production problems in the North Sea and growing tension with Iran, and it remained at around \$110/bl for the rest of the year.

**Natural gas** prices under the United Kingdom's annual contract were down slightly from 2011 to 64.6p/th, particularly as a result of the relaxed short-term situation. Despite the wave of cold weather in February and the diversion of most LNG towards Asia, gas stocks were replenished rapidly as domestic consumption in the UK was well below normal in the second quarter. Subsequently, prices remained relatively low until early autumn as the outlook for winter was relaxed. Forward gas prices rose significantly when the new annual contract came in at 1 October, since forward prices for 2013-2014 are not greatly affected by the short-term supply-demand balance.

## Natural gas and oil prices



1. Coal: Average ICE prices for delivery in Europe (CIF ARA) for the next calendar year (\$/t).

Oil: Brent first reference crude oil barrel, ICE index (front month) (\$/barrel).

Natural gas: Average ICE OTC prices, for delivery starting from October of the following year for the UK (NBP) (p/therm).

### 9.2.1.2 Electricity<sup>1</sup> and natural gas<sup>2</sup> consumption

Gross electricity consumption in **France** in 2012 amounted to 489.5 TWh, 2.1% higher than in 2011. This difference is mostly explained by the fact that temperatures were below normal in some months (February particularly, plus April and November) and 0.8°C below 2011 averages, resulting in a 13.7 TWh increase in electricity consumption.

After adjustment for weather effects, the fact that 2012 was a leap year (impact of +1.5 TWh) and the 4.9 TWh decrease in consumption by Eurodif following the permanent closure of this uranium enrichment plant run by Areva in June 2012, electricity consumption in France was stable overall from 2011 to 2012. Lower consumption by industrial and large business customers was offset by higher consumption by small business and residential customers.

Natural gas consumption in **France** rose by 4.5% in 2012 compared to 2011. This rise is attributable to the intensely cold weather of February 2012, and to a lesser extent, below-normal temperatures in April 2012. After adjustment for weather effects, consumption was down by 4.8%.

Domestic electricity consumption in the **United Kingdom** in 2012 was estimated at 317.8 TWh, stable since 2011. Gas consumption was estimated at 549.4 TWh, up by 9.7% from 2011, essentially as a result of colder weather conditions than in 2011.

In **Italy**, estimated domestic electricity and gas consumption was down by 2.8% and 4% respectively from 2011.

### 9.2.1.3 Electricity and natural gas tariffs

In **France**, the Finance Minister and the Minister for Ecology, Sustainable Development and Energy issued a decision on 20 July 2012 raising regulated electricity sale tariffs by 2.0% for the "blue" tariff (for residential and small business customers) and the "yellow" and "green" tariffs (for industrial and large business customers). This rise took effect on 23 July 2012.

In application of current laws and regulations, these tariffs must at least cover the costs incurred by historical operators, which the French market regulator CRE considers as accounting costs.

After discussion of the proposal for the above decision on 19 July 2012, the CRE issued the following opinions:

- it was in favour of the proposed decision regarding the green tariffs, which covered costs recorded in 2011 and forecast for 2012;
- it was not in favour of the proposal for the yellow tariffs, as although costs recorded in 2011 were covered, forecast costs for 2012 were not;
- it was not in favour of the proposal for the blue tariffs, which covered neither costs recorded in 2011 nor forecast costs for 2012.

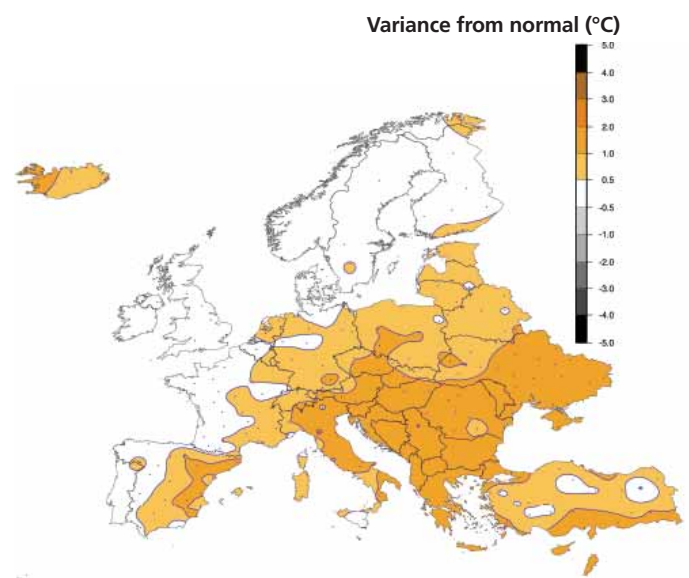
The decisions made by the French Council of State in October and November 2012 on regulated sales tariffs and the TURPE 3 network access are described in sections 9.2.2.4.1.3 and 9.2.2.4.1.4.

In the **United Kingdom**, EDF Energy reduced its gas tariffs for residential customers by 5% on 7 February 2012 and raised electricity and gas tariffs by 10.8% on 7 December 2012.

In 2011, it had raised its electricity and gas tariffs by 7.5% and 6.5% respectively in March, then again by 4.5% and 15.4% respectively in November.

### 9.2.1.4 Weather conditions: temperatures and rainfall

#### Average temperatures: variance from normal levels, January to December 2012<sup>3</sup>



After a mostly mild, dry month of January, there was a wave of significantly cold weather in the first fortnight of February with temperatures 4.6°C lower than normal over the whole month. A mild March followed, then a second quarter with close to normal temperatures. The early summer was cool and overcast across the whole of France, but there was a brief spell of hot weather in August. Finally, December started out cold before registering particularly mild temperatures all over the country.

The average temperatures for 2012 were higher than normal in the eastern half of France and close to normal in the rest of the country, and markedly higher than normal in southern and central Europe.

1. Sources France: RTE, raw and adjusted for weather effects.

Sources United Kingdom: Department of Energy and Climate Change for the first 3 quarters, local subsidiary estimation for the final quarter.  
Sources Italy: local subsidiary estimation.

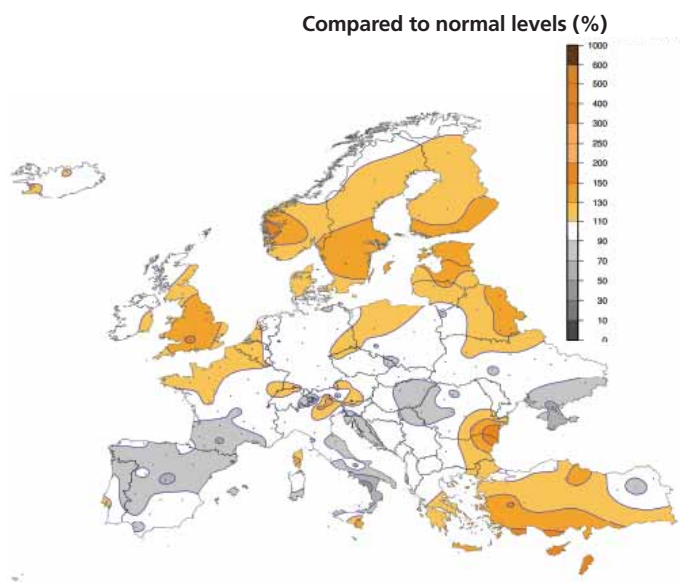
2. Sources France: Pégase database, source SOeS (Service de l'Observation et des Statistiques) for the first 11 months.

Sources United Kingdom: Department of Energy and Climate Change for the first 3 quarters, local subsidiary estimation for the final quarter.  
Sources Italy: local subsidiary estimation.

3. Source: Météo France.

Map comparing average temperatures with normal levels measured over 30 years (1971-2000 for Western Europe and 1961-1990 for Eastern Europe).  
Source: Base de Données Climatologiques, Météo France.

## Rainfall: variance from normal annual levels, January to December 2012<sup>1</sup>



2012 saw contrasting rainfall patterns in Europe; the weather was rather dry in the southern half (excluding Turkey), but normal and surplus rainfall levels were recorded in the northern half, particularly Scandinavia.

In France, the cumulative rainfall was also very different between the north and south: close to normal in the Alps (slightly above normal in the north Alps), with a slight shortfall in the north Massif Central and the south-west quarter of France (southern part of the Massif Central and Pyrenees). Significant variability was observed between:

- February, March and August, which were very dry;
- April, May, October and November (in the eastern half of the country), which were very wet.

Hydropower capacity levels in France were therefore very variable:

- low in February and March and then July, August and September;
- close to normal in May, June and October;
- above average at the end of the year.

It remained approximately 10% below normal over the whole year.

## 9.2.2 Significant events<sup>2, 3</sup>

### 9.2.2.1 New investments and partnerships

#### 9.2.2.1.1 Finalisation of the takeover of Edison

Following fulfilment of the conditions for the operation, on 24 May 2012 the EDF group and its Italian partners finalised the takeover of the energy group Edison. The principles of the final agreement are

consistent with the preliminary agreement signed by the parties on 26 December 2011.

The Group thus took control of Edison by purchasing Delmi's entire investment in TdE (50%) for a total of €784 million, corresponding to the negotiated price of €0.89 per Edison share.

Following this acquisition the Group held 78.96% of the capital and 80.64% of the voting rights in Edison.

At the same time as the Group took control of Edison, Delmi took control of Edipower by purchasing the investments in Edipower held by Edison (50%) and Alpiq (20%) for the total sum of €884 million.

Edison and Edipower also signed a long-term (6-year) gas supply contract to cover 50% of Edipower's gas requirements.

In compliance with Italian stock market regulations, on 2 July 2012 the EDF Group launched a mandatory tender offer for the remaining Edison shares, at the price of €0.89 per ordinary share. No offer was made for non-voting shares.

976,306,145 ordinary shares, corresponding to a total of €869 million, were tendered to the offer by minority shareholders by the closing date of 6 September 2012. The additional cost of raising this offer price from the €0.84 envisaged in the preliminary agreement of 26 December 2011 – a total increase of €48 million – was borne in equal shares by the EDF group and Delmi.

Between 2 and 30 November 2012, an offer was also made to Edison minority shareholders to convert their "saving shares", which carry no voting rights, into ordinary shares. As a result of this offer, 437,573 non-voting shares were converted into ordinary shares.

After the mandatory tender offer and the conversion offer for non-voting shares, the EDF group holds 97.40% of the capital and 99.48% of the voting rights of Edison at 31 December 2012.

#### 9.2.2.1.2 Takeover of Photowatt's business and PV Alliance

On 27 February 2012, the Vienne Commercial Court in France accepted the EDF group's offer for the activities of Photowatt. This operation and the concurrent operation involving the CEA (French atomic energy commission), enabled the Group, via its subsidiary EDF Énergies Nouvelles Réparties, to take over Photowatt's assets and 100% of its subsidiary PV Alliance, and to obtain a world exclusivity licence for the heterojunction technology currently in development.

#### 9.2.2.1.3 Acquisition of Enerest

On 1 April 2012, Électricité de Strasbourg acquired 100% of Enerest, owner of the Gaz de Strasbourg brand and the longstanding gas supplier to the economic region of Strasbourg. The acquisition price was €139 million.

#### 9.2.2.1.4 Renegotiation of gas supply contracts by Edison

During the second half of 2012, the Court of Arbitration of the ICC (International Chamber of Commerce) ruled in favour of Edison in the litigations over price revisions for the long-term natural gas supply contracts with Rasgas (Qatar) and ENI (Libya). This generated a positive impact of €680 million, which is included in the EDF group's EBITDA for 2012.

An arbitration procedure is still in progress concerning the natural gas supply contract with Sonatrach (Algeria). The ruling is expected in 2013.

1. Map comparing average rainfall with normal levels between January and December 2012. Normal rainfall is measured over 30 years (1971-2000 for Western Europe and 1961-1990 for Eastern Europe). Source: Base de Données Climatologiques, Météo France.

2. Significant events related to litigation are described in chapter 20.5.

3. The reference document and a full list of press releases are available from the EDF website: [www.edf.com](http://www.edf.com).

#### 9.2.2.1.5 Termination of the overall nuclear partnership between EDF and ENEL

In November 2007, EDF and ENEL entered into a series of agreements governing a partnership for nuclear activities, with Enel taking a 12.5% investment in the Flamanville 3 EPR.

Given the changes in the economic environment and the project itself, as well as the discontinuation of the Italian nuclear revival programme following the June 2011 referendum, EDF and Enel announced on 4 December 2012 that they were ending their partnership. They consequently waived their respective options in each other's programmes, and Enel withdrew from the Flamanville EPR project with effect from 19 December 2012. EDF has reimbursed Enel's investment in the project totalling €658 million (principal plus penalties) and in return, has recovered full rights to the electricity generated by Flamanville 3.

#### 9.2.2.1.6 Partial acquisition by EDF Énergies Nouvelles of Iberdrola's wind farms

On 31 December 2012 EDF Énergies Nouvelles undertook a commitment to acquire 20% of Iberdrola's 32 onshore wind farms in operation in France, for total installed power of 321.4 MW. On 2 January 2013 these infrastructures were sold for the total sum of €350 million to a consortium that also includes General Electric and the German financial group Re, each holding a 40% share.

#### 9.2.2.1.7 Sale of some of EDF Énergies Nouvelles wind farms

The principal sales by EDF Énergies Nouvelles in 2012 as part of its Development and Sale of Structured Assets business were of 50% of the Lakefield wind farm (totalling 205 MW) and the Spearville wind farm (100 MW) in the United States, and the Lac Alfred and Massif du Sud wind farms (each 75 MW) in Canada.

#### 9.2.2.1.8 Sale of the investment in Exelon

On 11 January 2013 EDF announced that it had sold its entire non-strategic 1.6% investment in NYSE-listed company Exelon (EXC.N) at the end of 2012. This transaction took place for an amount of approximately \$470 million, corresponding to an average selling price of \$34.70 per share i.e. an 18.6% premium on Exelon's latest closing share price at 10 January 2013.

### 9.2.2.2 Investment projects

#### 9.2.2.2.1 France

##### 9.2.2.2.1.1 Flamanville 3

In December 2012 EDF announced a revised cost for constructing the Flamanville EPR, adjusted upwards by €2 billion from the cost announced in July 2011 (approximately €6 billion<sub>2008</sub>). Output of the first KWhs for the market is scheduled for 2016.

In addition to the "lead unit" effect, certain factors have also affected the full cost of construction, including changes in the boiler design, additional engineering studies, incorporation of new regulatory requirements and the lessons learned in the wake of Fukushima. The revised cost also reflects the additional expenditure associated with industrial contingencies, such as replacement of the supports for the reactor building polar crane and its effect on the work schedule, with the financial impact of extending construction deadlines.

Significant milestones were reached at the Flamanville EPR site in 2012:

- completion of principal civil engineering work for the four safeguard buildings;
- the intake canal for the pumping station came on stream;
- start of installation of the filter drums for the pumping station to filter cooling water.

- completion of principal civil engineering work for the four safeguard buildings;
- the intake canal for the pumping station came on stream;
- start of installation of the filter drums for the pumping station to filter cooling water.

At 31 December 2012 the civil engineering work was 94% complete, and 39% of the electro-mechanical equipment was in place.

##### 9.2.2.2.1.2 Successful bid for French offshore wind farms

On 6 April 2012, the European consortium headed by the EDF group won the tender for French offshore projects at Saint-Nazaire, Courseulles-sur-Mer and Fécamp. These projects total around 1,500 MW in new capacities to be installed after 2015. They are accompanied by an ambitious industrial project that will create some 7,500 direct and indirect jobs, notably for production of Alstom's Haliade 150 wind turbine in France.

##### 9.2.2.2.1.3 Inauguration of the Martigues Combined Cycle Gas (CCG) plant

On 12 November 2012, EDF inaugurated the first CCG facility at the Martigues site. The Combined Cycle Gas turbine (CCGT) is an excellent solution to problems posed by fluctuating demand, and is environmentally friendly and energy-efficient. The generation unit runs on natural gas and is now capable of delivering up to 465 MW of electricity at full capacity to the electricity grid of France's Provence-Alpes-Côte d'Azur region. The Martigues CCG facility is the second of its kind to be operated by the EDF Group in France and the first to be built by "repowering", i.e. transforming parts of an existing facility, like the steam turbine, to combine it with a new unit comprising a combustion turbine and an exhaust-recovery boiler. A second CCGT with the same capacity is currently under construction at the Martigues site and will be commissioned during 2013.

#### 9.2.2.2.2 United Kingdom

##### 9.2.2.2.2.1 Extension of operating lifetimes of nuclear plants in the United Kingdom

EDF Energy expects to extend the operating lifetimes for all its Advanced Gas-cooled Reactor (AGR) nuclear plants, by an average seven years more than the period forecast when the Group took over British Energy in January 2009. This extension has a direct impact on the depreciation period for these reactors.

EDF Energy announced on 4 December 2012 that it was extending the operating life of two of its nuclear power stations, Hunterston B and Hinkley Point B, by seven years. These two plants will remain in operation until at least 2023.

##### 9.2.2.2.2.2 Key advances in the Hinkley Point C project

On 26 November 2012, the Office for Nuclear Regulation (ONR) announced that it had granted a nuclear site licence to NNB Generation Company, the entity set up by EDF Energy, to build a new double EPR power plant at Hinkley Point C in Somerset.

On 13 December 2012, the UK authorities approved EDF and Areva's design for the EPR. The ONR and the Environment Agency considered that the reactor met the vital criteria as regards security and environmental impact.

The Energy Bill including the "Contract for Difference" (CFD) – whose mechanism is explained in § 9.2.2.4.3 - is a key milestone for the project and the implementation of the reforms it introduces is expected in 2013-2014. As such an Investment Contract (an early form of CFD) is being negotiated with the Department of Energy and Climate Change (DECC) for HPC. The conclusion of these discussions remains a key step for the HPC Final Investment Decision (FID).



## 9.2.2.2.3 Other international

### 9.2.2.2.3.1 Installation of the EPR Unit 1 reactor pressure vessel and Unit 2 dome at Taishan

Construction of the two EPRs at Taishan in China, coordinated by teams from EDF, CGNPC (China Guangdong Nuclear Power Company) and Areva, reached further key milestone in 2012.

In early June 2012 the pressure vessel was lowered into the Unit 1 reactor, then installed in its final position in the reactor pit. This operation marked the start of work to install the nuclear steam supply system, alongside installation of auxiliary equipment and systems.

In September 2012, the site's owner and future operator, Taishan Nuclear Power Joint Venture Company (TNPJVC), successfully installed the dome of the Unit 2 reactor building.

## 9.2.2.2.4 Other activities

### 9.2.2.2.4.1 EDF Énergies Nouvelles gains positions on the Moroccan and South African markets

On 16 April 2012, the consortium headed by EDF Énergies Nouvelles, in partnership with the Japanese group Mitsui & Co, was selected as the "preferred bidder" for the 150 MW Taza wind power project by Morocco's National Electricity Office. EDF Énergies Nouvelles also announced that it was to form a local subsidiary, EDF EN Maroc, to lead its development in Morocco.

On 31 May 2012, EDF Énergies Nouvelles was also named the "preferred bidder" by the South African energy department for three wind power projects allocated as part of the second round of renewable energy tenders in South Africa, which was launched in August 2011. Representing total power of 104 MW, the projects at Chaba (20.6 MW), Waainek (23.3 MW) and Grassridge (59.8 MW) are located in the Eastern Cape province of South Africa. They will be equipped with Vesta turbines, each with 3 MW unit capacity. Construction is due to start in 2013, with commissioning by the end of 2014.

### 9.2.2.2.4.2 Commissioning of wind farms in North America

In 2012, EDF Énergies Nouvelles consolidated its positions in North America, where several wind farms started operation during the second half-year: Spearville 3 (100.8 MW) in Kansas, Spinning Spur (161 MW) then Bobcat Bluff (150 MW) in Texas, Pacific Wind (140 MW) and Shiloh IV (102.5 MW) in California. In Canada, a first wind farm was also opened in October 2012 in Quebec province with installed power of 80 MW.

### 9.2.2.2.4.3 Commissioning of 3 new solar power plants in France

During the second half of 2012, EDF Énergies Nouvelles commissioned 3 new solar power plants in France: Crucey, in the Centre region, in September 2012, Massangis in Burgundy in October 2012 and Toul-Rosières in Lorraine in November 2012.

These plants have been developed and created by EDF Énergies Nouvelles France. They are equipped with new-generation "thin layer" solar panels and have installed power of 60MWp, 56MWp and 115 MWp respectively.

### 9.2.2.2.4.4 Launch of Electranova Capital

On 15 May 2012, EDF announced that it had joined forces with Idinvest Partners, a reputed specialist in small business funding, to create a venture capital fund called Electranova Capital, endowed with a minimum investment capacity of €60 million, including €30 million contributed by EDF and €10 million by Allianz. The fund will finance innovative young companies in the energy sector, in France and throughout Europe, by taking minority shareholdings in order to rise to the challenge of a low-carbon energy model.

Electranova Capital made its first two investments in October 2012, in the following companies:

- the French company Activity, specialising in intelligent networks;
- the Norwegian company Seatower, which specialises in foundation for offshore wind turbines that respect the marine ecosystem.

### 9.2.2.2.4.5 Foundation stone laid for the Dunkirk LNG terminal

Construction of the Dunkirk LNG terminal is managed by the subsidiary Dunkerque LNG, with the work contracted out to three consortiums. Technical progress is on schedule and the following has already been completed:

- civil engineering work for the tunnel connecting the Gravelines plant to the terminal has begun; ultimately the plant's tepid water will be used for regasification of the LNG;
- work has started on construction of the concrete casing for the three LNG tanks.

The site was inaugurated on 5 October 2012 by Henri Proglio.

The two operators of the Belgian and French natural gas network also began to build a new interconnection between France and Belgium.

### 9.2.2.2.4.6 Start of construction of the Southstream gas pipeline

On 7 December 2012, Gazprom launched construction work for the Southstream gas pipeline, which will bring Russian gas to the European Union from 2015. The pipeline is 3600 km long and should carry 63 billion m<sup>3</sup> of gas (700 TWh) a year through the Black Sea and the Balkans. EDF is a 15% stakeholder in the undersea section, along with Gazprom (50%), Eni (20%) and Wintershall (15%).

## 9.2.2.3 Accreditations

### 9.2.2.3.1 New accreditation for EDF: the FTSE4Good Index

On 12 March 2012, following an in-depth independent analysis and examination of social, environmental and nuclear safety criteria, the FTSE4Good Policy Committee approved the EDF group's admission to the prestigious FTSE4Good index. EDF is now one of five nuclear operators worldwide that meet the stringent criteria developed and monitored by the FTSE4Good Policy Committee. These criteria are designed to identify and measure the performance of companies that work for sustainable environmental protection, develop positive relations with all stakeholders and strive to promote human rights and their enforcement.

### 9.2.2.3.2 Two distinctions for the Group's expertise in training

The EDF Corporate University for Management, which caters for the Group's 12,000 managers, has won the 13th Corporate University Xchange Prize for Excellence and Innovation, a global benchmark in terms of corporate learning. This distinction was awarded for a training programme carried out with the Toulouse School of Economics' Institute of Industrial Economics for the leaders of ERDF, a subsidiary of the EDF group. The programme focused on the economics of local concession mechanisms in the electricity distribution industry.

A few weeks earlier, the Group's training expertise had already received the international Corporate Learning Improvement Process accreditation.



## 9.2.2.4 Regulatory environment

### 9.2.2.4.1 France

#### 9.2.2.4.1.1 The NOME law and the ARENH system

On 12 June 2012, the European Commission announced that subject to conditions, it approved the State aid contained in the regulated electricity tariffs in France. In 2007, the Commission had opened an investigation into the regulated tariffs for sales to business customers (the “yellow” and “green” tariffs and the TaRTAM transition tariff). Since then, France’s NOME law on the new electricity market organisation modified the French legislative and regulatory context by discontinuing the TaRTAM transition tariff, programming the end of the yellow and green tariffs for the end of 2015 and setting up a scheme for regulated access to nuclear power (named ARENH, for *Accès Régulé à l’Électricité Nucléaire Historique*) for all suppliers of customers located in France from 1 July 2011, at the price of €42/MWh for 2012.

The first ARENH supplies to EDF’s competitors represent an annual volume of some 61 TWh. The annual volume cannot exceed 100 TWh, and will be progressively increased from 1 January 2014 by the amounts sold to network operators to compensate for technical losses, according to a timetable set by government decision.

The ARENH price, currently set at €42/MWh, will later represent the economic conditions of generation by the existing nuclear fleet, in application of a decree stipulating the costs making up the ARENH price that is to be published no later than 7 December 2013.

#### 9.2.2.4.1.2 CSPE

The Contribution to the Public Electricity Service (*Contribution au Service Public de l’Électricité* or CSPE) is intended to compensate for certain public service charges assigned to EDF in particular.<sup>1</sup> The CSPE is based on electricity consumption and collected directly from the end-user. The amended Finance Law of July 2011 departed from the schedule for CSPE rises, splitting the €3/MWh increase for 1 January 2012 so that it applied half from 31 July 2011 and half from 1 July 2012. A €1.5/MWh rise was thus introduced on 1 July 2012, bringing the CSPE to €10.5/MWh.

Since then it has been increased to €13.5/MWh.

A decree of 6 March 2012 introduced automatic attribution of social electricity tariffs (financed by the CSPE). 1,083,000 French households benefited from social tariffs in 2012, compared to only 600,000 households in 2011.

In June 2012, the French Court of Accounts remitted a report on the CSPE to the Senate investigative committee examining the true cost of electricity. The Court observed the current and future increase in public service expenses. It noted that the expenses borne by EDF (cost of bearing the shortfall and managing purchase obligations) are not covered by the system and acknowledged that the request for formal recognition of these costs was “not economically unfounded”. It identified areas for reflection to limit the impact of future rises in the CSPE for electricity consumers: for example, broadening financing of the system to other energies, use of other sources of electricity-generated income, and revision of the current exemption rules.

Since 2007, CSPE income has been unable to cover EDF’s public electricity service expenses, which have been steadily rising, primarily due to the higher volumes of wind power and solar power purchased under the purchase obligation scheme. As the costs borne by local distribution companies and Électricité de Mayotte are fully compensated, the shortfall is borne solely by EDF, leading to recognition of a €5.2 billion receivable in its 2012 financial statements (an increase of €1.4 billion from the €3.8 billion recorded in 2011).

EDF’s expenses to be compensated by the CSPE rose from €3.6 billion in 2011 to €4.7 billion in 2012, while the CSPE collected amounted to €2.5 billion in 2011 and €3.3 billion in 2012.

The expenses for 2012 comprise €3.2 billion in excess costs for purchase obligations in mainland France, €1.4 billion for non-interconnected zones, and €0.1 billion in solidarity charges.

The rise in these expenses for EDF is explained by a higher level of excess costs for purchase obligations in mainland France (€0.8 billion) and an increase in costs for the non-interconnected zones (€0.2 billion).

Purchase obligations mainly rose as a result of volume effects: wind power output was up by 3 TWh from 2011 causing a rise of €0.1 billion, and photovoltaic power output was up by 2 TWh causing a rise of €0.8 billion.

On 14 January 2013 EDF announced that it had reached an agreement with the French authorities for reimbursement of the receivable resulting from the shortfall in CSPE income at 31 December 2012 (around €4.3 billion, a figure that will be adjusted before 31 December 2013 to reflect the amount of deficits related to public service charges as confirmed by the CRE) and the costs of bearing this shortfall for the Group (€0.6 billion). The agreement sets a progressive payment schedule such that the total receivable of some €4.9 billion plus interest at market rates will be totally reimbursed by 31 December 2018.

As a result of this agreement, the Group recorded financial income of €0.6 billion at 31 December 2012, corresponding to the past cumulative costs of bearing the deficit at that date.

#### 9.2.2.4.1.3 Electricity sales tariffs

The French Council of State issued a decision on 22 October 2012 at the request of SIPPAREC, cancelling its decision of 13 August 2009 setting regulated electricity sales tariffs. The Council of State required the ministers of energy and the economy to issue a new decision within three months to set regulated sales tariffs for the period 15 August 2009 to 13 August 2010. At the date of publication of this report, a proposed decision had been sent to the CRE for examination.

#### 9.2.2.4.1.4 TURPE 3 network access tariffs

In a decision of 28 November 2012, the Council of State cancelled the TURPE 3 network access tariff (*Tarifs d’Utilisation des Réseaux Publics d’Électricité*) which had been approved on 5 May 2009 by the ministers of energy and the economy, after a proposal from the CRE. This decision requires a new version of the TURPE 3 to be set by 1 June 2013, does not change the regulated tariffs for sales to customers. The new version of the TURPE 3 – which will apply retroactively to the period 2009-2013 and will replace the cancelled tariff – will be proposed by the CRE to the competent ministers. The new tariff decision is currently in preparation (see chapter 20.5).

#### 9.2.2.4.1.5 Application decree for article 225 of the “Grenelle 2” law

The French government published the application decree for article 225 of the “Grenelle 2” law on 26 April 2012, making reporting of labour, environmental and social information in the management report mandatory for companies with a workforce of over 500 and a balance sheet total or total net sales of more than €100 million. A decision defining requirements for auditing of this nonfinancial reporting by an independent organisation should be issued in 2013. This audit requirement will complement the Group’s voluntary decision to have a selection of quantitative indicators verified, applied since 2007.

The EDF group has assessed the impact of this decree and decision for its overall organisation, but also for the French subsidiaries concerned (Électricité de Strasbourg and ERDF). This analysis, in addition to the assessments carried out in 2011, provided an opportunity for the Group to check the compliance of its existing system, set up several years ago, and make any necessary improvements starting with the 2012 management report.

1. Local distribution companies and Électricité de Mayotte also make small contributions to the system.

## 9.2.2.4.1.6 Compliance with ASN recommendations concerning the nuclear fleet

Following the recommendations put forward by the French nuclear safety authority ASN on 28 June 2012 as part of its additional safety assessments, EDF confirms its commitment to carrying out work to reinforce the safety level at its nuclear facilities. This work on its nuclear fleet is part of the Group's overall investment programme for the period to 2015.

EDF has already begun an action plan in accordance with the ASN's technical recommendations, including for example:

- introduction of the rapid response nuclear task force (*Force d'Action Rapide du Nucléaire – FARN*) capable of intervening in an emergency. At 31 December 2012, this task force can take action at any French nuclear reactor in difficulty, and by the end of 2015 up to 6 simultaneous interventions will be possible;
- development of local crisis centres to manage extreme events;
- the tender process for production of emergency diesel generators.

## 9.2.2.4.2 Belgium

The regulatory environment changed substantially in Belgium in 2012, affecting EDF Luminus in several ways.

The nuclear tax levied on nuclear operators in Belgium increased from €250 million in 2011 to €550 million in 2012, resulting in a €15 million increase in EDF Luminus' share.

The Belgian government brought in a new energy market regulation through the law of 29 March 2012, freezing indexed rises in variable parameters contained in gas and electricity contracts for 9 months from 1 April 2012. This regulation affected EDF Luminus in 2012, particularly in the second half-year.

The royal decision of 29 March 2012 reduced the State contribution to the costs of energy sellers by applying social tariffs for electricity to their customers.

The national regulator CREG<sup>1</sup> approved the new tariffs for Elia, the electricity transmission network operator, for the period 2012-2015. These include an grid injection tariff that is now borne by generators.

On 4 July 2012, the Belgian government decided to shut down the Doel 1 and Doel 2 nuclear plants (in which EDF has no investments) in

2015, and to extend operation of the Tihange 1 plant until 2025, under the plan for secure electricity supplies presented by the Belgian Secretary of State for Energy. The Belgian Council of Ministers has also planned to make 1,000 MW of nuclear power available on the market, to increase competition between suppliers and achieve the lowest possible prices for consumers and business users.

Also, during the summer of 2012, inspections of the core tanks at Doel 3 and Tihange 2 detected micro-cracks and were shut down while awaiting additional analyses by the Federal Nuclear Control Agency (AFCN) and Electrabel. Once the AFCN has issued its conclusions, the Belgian government will decide whether to bring these power plants back online during the first half of 2013.

## 9.2.2.4.3 United Kingdom

On 22 May 2012, British minister for Energy and Climate Change, presented a draft bill for a law on electricity market reform intended to attract around £110 billion (€136 billion) of investments in nuclear power and renewable energies over ten years. The chief innovation in this reform is the introduction of "contracts for difference" (CFD), a contractual mechanism intended to guarantee an economic balance between new low-carbon electricity generation methods, comprising renewable energies (wind power, solar power, biomass, etc) and nuclear power plants. If it decided to invest in the Hinkley Point C project, EDF would be compensated for selling electricity generated by the new reactors below an agreed price, and conversely would repay the surplus if it sold electricity at a higher price.

This bill was presented to the Chamber of Commons on 29 November 2012.

## 9.2.2.4.4 Hungary

An amendment to the law on electricity adopted on 16 March 2011 ended all support for cogeneration in Hungary from July 2011, and stipulated that heat tariffs would now be regulated. The price must now be set by the Hungarian government after proposal by the regulator, and is no longer freely negotiated between suppliers and their customers. This amendment particularly affected BE ZRt.

After a transitional period in the final quarter of 2011, new more favourable heat tariffs were published from 1 January 2012. These tariffs are sufficient to cover the associated costs. On 31 October 2012, a new decree was published, introducing an average rise in heat tariffs with a positive impact for BE ZRt in 2012.

1. CREG: Commission de Régulation de l'Électricité et du Gaz en Belgique.

### 9.3 Analysis of the business and the consolidated income statements for 2012 and 2011

Presentation and analysis of the consolidated income statements for 2011 and 2012 is presented on two levels for sales and EBITDA: a first focusing on the Group, then a second examining the different business segments (France, United Kingdom, Italy, Other international and Other activities). EBIT (operating profit) and net income are analyzed from a more general standpoint.

Edison figures are fully consolidated from the takeover of Edison.

The comments below are based on comparisons with the figures for 2011 after restatement for the impact of the change in accounting method for actuarial gains and losses on post-employment benefits.

(In millions of Euros)	2012	2011 restated
<b>Sales</b>	<b>72,729</b>	<b>65,307</b>
Fuel and energy purchases	(37,098)	(30,195)
Other external expenses	(10,087)	(9,931)
Personnel expenses	(11,624)	(10,802)
Taxes other than income taxes	(3,287)	(3,101)
Other operating income and expenses	5,451	3,661
<b>Operating profit before depreciation and amortisation (EBITDA)</b>	<b>16,084</b>	<b>14,939</b>
Net changes in fair value on Energy and Commodity derivatives, excluding trading activities	(69)	(116)
Net depreciation and amortisation	(6,849)	(6,285)
Net increases in provisions for renewal of property, plant and equipment operated under concessions	(164)	(221)
(Impairment)/Reversals	(752)	(640)
Other income and expenses	(5)	775
<b>Operating profit (EBIT)</b>	<b>8,245</b>	<b>8,452</b>
<b>Financial result</b>	<b>(3,362)</b>	<b>(3,780)</b>
<b>Income before taxes of consolidated companies</b>	<b>4,883</b>	<b>4,672</b>
Income taxes	(1,586)	(1,336)
Share in income of associates	260	51
<b>GROUP NET INCOME</b>	<b>3,557</b>	<b>3,387</b>
Net income attributable to non-controlling interests	241	239
<b>EDF NET INCOME</b>	<b>3,316</b>	<b>3,148</b>
<b>Earnings per share (in Euros)</b>	<b>1.80</b>	<b>1.70</b>
<b>Diluted earnings per share (in Euros)</b>	<b>1.80</b>	<b>1.70</b>

#### 9.3.1 Sales

Consolidated sales rose by 11.4%, with organic growth of 5.8%.

##### 9.3.1.1 Change in group sales

(In millions of Euros)	2012	2011 restated	Variation	Variation (%)	Organic growth (%)
<b>Sales</b>	<b>72,729</b>	<b>65,307</b>	<b>7,422</b>	<b>+11.4</b>	<b>+5.8</b>

Sales amounted to €72,729 million in 2012, an increase of €7,422 million (+11.4%) from 2011. Excluding the effects of exchange rates (€674 million), principally reflecting the pound sterling's rise against the Euro, and excluding changes in the scope of consolidation (€2,983 million) essentially relating to the takeover of Edison, organic growth stood at +5.8%.

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Analysis of the business and the consolidated income statements for 2012 and 2011

## 9.3.1.2 Change in sales by segment

(In millions of Euros)	2012	2011 restated	Variation	Variation (%)	Organic growth (%)
France	39,120	37,171	1,949	+5.2	+5.2
United Kingdom	9,739	8,568	1,171	+13.7	+6.4
Italy	10,098	6,552	3,546	+54.1	+10.8
Other International	7,976	7,501	475	+6.3	+5.5
Other activities	5,796	5,515	281	+5.1	+2.8
Total excluding France	33,609	28,136	5,473	+19.5	+6.5
<b>GROUP SALES</b>	<b>72,729</b>	<b>65,307</b>	<b>7,422</b>	<b>+11.4</b>	<b>+5.8</b>

Sales outside France represented 46.2% of total consolidated sales in 2012, compared to 43.1% in 2011.

### 9.3.1.2.1 France

#### Change in sales in the "France" segment

France's contribution to Group sales amounted to €39,120 million, corresponding to an organic rise of 5.2% compared to 2011.

This sales growth mainly results from the higher volumes sold of both electricity (+7.2 TWh) and gas (+2.9 TWh) generating an additional €1 billion, and the increase in prices and tariffs for electricity (in July 2011 and July 2012) and gas, which had an impact of €670 million. The progression in electricity sales volumes was driven by residential customers, due to the colder weather (+13 TWh compared to 2011), whereas consumption by industrial customers was down.

At 31 December 2012, EDF's share of the electricity market for all final customers was 80.0%, 0.2 points lower than at 31 December 2011. EDF's share of the natural gas market was 4.3%, up by 0.7 points from 2011.

## Breakdown of sales for the "France" segment between deregulated activities<sup>1</sup>, network activities<sup>2</sup> and island activities<sup>3</sup>

(In millions of Euros)	2012	2011 restated	Variation	Variation (%)
Sales	39,120	37,171	1,949	+5.2
Deregulated activities	37,001	35,270	1,731	+4.9
Network activities	13,309	12,254	1,055	+8.6
Island activities	907	862	45	+5.2
Eliminations	(12,097)	(11,215)	(882)	

The 4.9% increase in sales by the deregulated activities is primarily attributable to the favourable impact of the increase in volumes, chiefly resulting from weather conditions.

Sales by the network activities rose by 8.6% due to the combined effect of the rise in tariffs and the higher volumes sold since the winter weather was harsher in 2012 than 2011.

1. Generation, supply and optimisation in mainland France, and sales of engineering and consulting services.

2. Network activities only include Distribution from 2011, as a result of application of the equity method to the Transmission activity from 31 December 2010. In mainland France, network activities are regulated via the network access tariff TURPE (Tarifs d'Utilisation des Réseaux Publics d'Électricité). Sales for the regulated activities include the delivery cost included in integrated Tariffs.

3. EDF's generation and distribution activities in the island energy systems (IES).

### Electricity generation

Nuclear generation produced 404.9 TWh in 2012, compared to 421.1 TWh for 2011, down by 16.2 TWh. This contraction is explained by extended scheduled shutdowns in 2012 due to technical reasons, inspections and additional work during the outages and exceptionally low demand at the end of the year when the weather was particularly mild. The availability coefficient was 79.7% in 2012, 1 point lower than in 2011.

Hydropower output stood at 34.5 TWh, an improvement from 2011 (+7.7 TWh) due to the much less unfavourable water availability levels (for a description of weather conditions see section 9.2.1.4).

Fossil-fired generation produced 14.9 TWh, 3.1 TWh more than in 2011. This rise is mainly attributable to the differential between electricity and fossil fuel prices which was more favourable for fossil-fired generation, especially during the wave of cold weather in February 2012.

Sales volumes to final customers (a market segment that includes Eurodif and local distribution companies) were up by +7.2 TWh, including +13 TWh attributable to temperature differentials. A volume of 60.8 TWh of electricity was supplied under the NOME law.

EDF was a net purchaser of 25.4 TWh on the wholesale markets in 2012, corresponding to a 18.1 TWh increase in net volumes purchased.

#### 9.3.1.2.2 United Kingdom

The **United Kingdom's** contribution to Group sales amounted to €9,739 million in 2012, up by 13.7% from 2011 with organic growth of 6.4%. Compared to 2011 sales, this includes a favourable exchange effect of €626 million.

Business benefited from favourable price effects driven by rising wholesale prices in all segments.

However, UK sales incorporate unfavourable volume effects resulting from lower sales to business customers against aggressive competition, and structured sales following expiry of the legacy contracts transferred from British Energy. This downturn was partly counterbalanced by a rise in gas and electricity volumes sold to domestic customers, especially due to growth in the number of customer accounts, and favourable weather effects.

#### 9.3.1.2.3 Italy

**Italy**<sup>1</sup> contributed €10,098 million to consolidated sales, up by 54.1% with organic growth of 10.8%.

Sales by Edison registered organic growth of €721 million.

In the electricity business, sales benefited from an increase in electricity prices that was partly counterbalanced by a negative volume effect for sales to final customers and on the wholesale markets.

In the hydrocarbon business, sales grew as a result of higher commodity prices and an overall volume effect, with larger sales volumes to wholesalers, industrial customers and residential customers, and higher generation volumes in Exploration-Production due to commissioning of new facilities during 2011.

#### 9.3.1.2.4 Other international

The **Other international** segment principally covers operations in Europe excluding the United Kingdom and Italy, and operations in the United States, Brazil and Asia (China, Vietnam and Laos).

This segment contributed €7,976 million to Group sales in 2012, €475 million or +6.3% more than in 2011.

Foreign exchange effects between 2011 and 2012 amounted to +€15 million. The effect of changes in the scope of consolidation in this segment essentially reflects changes in the consolidation method for the Polish subsidiaries Zielona Gora and Kogeneracja<sup>2</sup>. Without these scope and exchange effects, sales would show organic growth of 5.5% compared to 2011.

Most of this increase concerns Austria, and to a smaller extent Belgium and Poland. However, sales showed a slight downturn in Hungary and the USA.

In **Austria**, sales stood at €625 million, registering organic growth of 49.9%, essentially explained by development in the optimisation business. This had no significant impact on the margin.

In **Belgium**, sales amounted to €3,771 million, corresponding to organic growth of +4.9%. This growth chiefly results from the rise in gas volumes sold as a result of favourable weather effects.

**Poland** registered 8.6% organic growth in sales, due to higher electricity sales volumes, the favourable impact of optimisation, and higher sales of green and yellow certificates (for renewable energies and gas) than in 2011.

#### 9.3.1.2.5 Other activities

**Other activities** comprise, among other entities, EDF Énergies Nouvelles, EDF Trading, Electricité de Strasbourg and the investment in Dalkia

The contribution by the **Other activities** segment to Group sales in 2012 was €5,796 million, up by €281 million or 5.1%, with organic growth of 2.8% compared to 2011.

**EDF Énergies Nouvelles'** contribution to Group sales showed organic growth of 13.8% from 2011. This growth resulted primarily from the greater operating capacities for Generation. It also reflects the higher sales by the Development-Sales of Structured Assets activity.

**EDF Trading's**<sup>3</sup> sales saw an organic decline of 13.9% from 2011, particularly due to difficult market conditions in North America.

**Dalkia's** contribution to sales registered organic growth of €78 million (3.3%), mainly in continental Europe.

1. Edison and Fenice groups.

2. From proportional consolidation to full consolidation on 16 February 2012 after acquisition of EnBW's investments in these companies.

3. EDF Trading sales consist of its trading margins.



## 9.3.2 Operating profit before depreciation and amortisation (EBITDA)

EBITDA rose by 7.7%, with organic growth of 4.6%.

(In millions of Euros)	2012	2011 restated	Variation	Variation (%)	Organic growth (%)
<b>Sales</b>	<b>72,729</b>	<b>65,307</b>	<b>7,422</b>	<b>+11.4</b>	<b>+5.8</b>
Fuel and energy purchases	(37,098)	(30,195)	(6,903)	+22.9	+13.3
Other external expenses	(10,087)	(9,931)	(156)	+1.6	-0.4
Personnel expenses	(11,624)	(10,802)	(822)	+7.6	+6.3
Taxes other than income taxes	(3,287)	(3,101)	(186)	+6.0	+5.7
Other operating income and expenses	5,451	3,661	1,790	+48.9	+47.9
<b>EBITDA</b>	<b>16,084</b>	<b>14,939</b>	<b>1,145</b>	<b>+7.7</b>	<b>+4.6</b>

### 9.3.2.1 Change in consolidated EBITDA and analysis

**Consolidated EBITDA** for 2012 amounted to €16,084 million, up by 7.7% from 2011, corresponding to organic growth of 4.6%. Changes in the scope of consolidation had a positive effect of €309 million, principally concerning Edison. The favourable foreign exchange effect of €154 million mostly resulted from the rise of the pound sterling against the Euro.

The Group's **fuel and energy purchases** amounted to €37,098 million in 2012, an increase of €6,903 million (+22.9%) compared to 2011, with organic growth at 13.3%. **France** registered an organic rise of 16.1% essentially explained by the increase in purchase obligations (€1 billion, offset by the CSPE recorded in Other operating income and expenses). In the **United Kingdom**, the organic growth of €169 million (+3.5%) is essentially explained by the higher cost of energy, and transmission and distribution tariffs. In **Italy**, the organic growth of 16.2% was mainly driven by a rise in gas sourcing costs. In the **Other International** segment, the 10.1% organic growth was mainly associated with the higher volumes concerned by optimisation activities in Belgium and Austria.

The Group's **other external expenses** amounted to €10,087 million, up by €156 million (+1.6%) from 2011, corresponding to slightly negative organic growth of -0.4%. The unfavourable organic variations in the **United Kingdom** (-€93 million) and **Italy** (-€50 million) is more than offset by the lower decrease in France, after introduction of a reinforced

management plan for nuclear units improved monitoring of normal maintenance expenditure and scheduled regular checks.

The Group's **personnel expenses** totalled €11,624 million, €822 million higher than in 2011, with organic growth of 6.3%. This change essentially related to **France**, where personnel expenses totalled €8,676 million, corresponding to organic growth of 7.6% since 2011, as a result of the increase in the workforce, the effect of pay measures, and the rise in employer's social charges (now calculated on a broader basis).

**Taxes other than income taxes** stood at €3,287 million for 2012, up by €186 million from 2011 (+6.0%, or 5.7% in organic growth). This rise includes the effect of higher taxes for the Generation activity in France.

**Other operating income and expenses** generated net income of €5,451 million for 2012, €1,790 million higher than in 2011, or an organic variation of +47.9%. In **France**, the organic rise of €1,613 million is attributable to the €1,131 million increase in the CSPE associated with the higher compensation for purchase obligations, and the positive effect of the end of the TaRTAM transition tariff system in July 2011. In **Italy**, Edison's other operating income and expenses showed an organic rise of €347 million due to the favourable effect of prior-year shares of the results of renegotiation of long-term natural gas supply contracts. In the **United Kingdom**, in contrast, other operating income and expenses showed an organic decline of €227 million due mainly to the unfavourable effect of the fair value adjustment of electricity sale contracts at the time of EDF's acquisition of British Energy.

### 9.3.2.2 Consolidated EBITDA and analysis by segment

(In millions of Euros)	2012	2011 restated	Variation	Variation (%)	Organic growth (%)
<b>France</b>	<b>9,930</b>	<b>9,196</b>	<b>734</b>	<b>+8.0</b>	<b>+8.0</b>
United Kingdom	2,054	1,942	112	+5.8	-1.5
Italy	1,019	592	427	+72.1	+23.1
Other International	1,067	1,280	(213)	-16.6	-19.5
Other activities	2,014	1,929	85	+4.4	+4.7
<b>Total excluding France</b>	<b>6,154</b>	<b>5,743</b>	<b>411</b>	<b>+7.2</b>	<b>-0.9</b>
<b>GROUP EBITDA</b>	<b>16,084</b>	<b>14,939</b>	<b>1,145</b>	<b>+7.7</b>	<b>+4.6</b>

### 9.3.2.2.1 France

#### Change in EBITDA for the "France" segment

France contributed €9,930 million of consolidated EBITDA for 2012, 8.0% higher than in 2011 both at face value and in terms of organic growth. This contribution accounted for 61.7% of Group EBITDA, identical to 2011.

### Breakdown<sup>1</sup> of EBITDA for the "France" segment between deregulated activities, network activities and island activities

(In millions of Euros)	2012	2011 restated	Variation	Variation (%)
EBITDA	9,930	9,196	734	+8.0
Deregulated activities	6,209	6,116	93	+1.5
Network activities	3,451	2,820	631	+22.4
Island activities	270	260	10	+3.8

EBITDA for the deregulated activities rose slightly by 1.5%.

This essentially reflects:

- volumes: the effect of lower nuclear generation (-€635 million), partly counterbalanced by the improved hydropower output (+€357 million), and an unfavourable weather effect (-€208 million) mainly due to the wave of cold weather in February 2012 which caused a peak in demand that was met at high cost, and a €177 million increase in operating expenses;
- prices: the favourable effect of long-term contracts and Eurodip contract (+€238 million), the end of the TaRTAM transition tariff system (+€225 million) and the slight rise in the portion of regulated sale tariffs concerning energy (excluding delivery) (+€188 million).

EBITDA for the network activities registered a 22.4% increase resulting from the tariff increase for energy delivery, the favourable weather effect and the negative impact of correction of the rate of prior year network losses recorded in 2011, which had no equivalent in 2012.

EBITDA for the island activities was up by €10 million (+3.8%), principally due to the tariff increase.

### 9.3.2.2.2 United Kingdom

The **United Kingdom's** contribution to Group EBITDA for 2012, including the impact of fair value adjustment of British Energy's initial balance sheet, was €2,054 million, up by 5.8% from 2011, with an organic change of -1.5%. The favourable foreign exchange effect, amounting to €142 million, relates to the pound sterling's rise against the Euro between 2011 and 2012.

Excluding the unfavourable impact of fair value adjustment of British Energy's initial balance sheet (particularly electricity sale contracts), EBITDA showed organic growth of 7.5%.

The operating performance was marked by a rise of 4.2 TWh (+7.5%) in nuclear power output to 60.0 TWh and a rise of 6.5 TWh in coal-fired generation output achieved by good availability in the generation fleet. This factor and the higher wholesale prices had a favourable effect on margins.

### 9.3.2.2.3 Italy

The **Italy** segment contributed €1,019 million to the Group's consolidated EBITDA, an increase of 72.1% from 2011 (organic increase of +23.1%).

**Edison** contributed €918 million to consolidated EBITDA in 2012 against €480 million in 2011, corresponding to organic growth of €148 million or 30.8%.

The hydrocarbon activities' contribution to EBITDA rose significantly from 2011 (+€294 million). The arbitration rulings<sup>2</sup> in Edison's favour in September and October 2012 regarding long-term gas supply contracts with Rasgas (Qatar) and ENI (Libya) generated a €680 million increase in EBITDA (including €347 million for previous years). Exploration-Production also registered good results. Nonetheless, these activities are still adversely affected by falling margins on gas sales to end customers, which resulted from lower demand combined with high availability on spot markets at European gas hubs, causing decorrelation between spot gas prices and the cost of long-term contracts. A new phase of price reviews with gas suppliers began in the fourth quarter of 2012, to restore the profitability of these contracts. Arbitration proceedings concerning the Algerian gas import contract are currently in process, with a ruling expected in 2013.

EBITDA for the electricity activities declined, primarily due to shrinking unit margins on the final customer market and lower profits on the balancing market than in 2011.

### 9.3.2.2.4 Other international

EBITDA for the **Other international** segment stood at €1,067 million in 2012, down by 16.6%, corresponding to an organic decline of 19.5%.

EBITDA in **Poland** registered an organic decline of €113 million, including the effect of contracting margins caused by a rise in biomass fuel prices and a fall in the price of green certificates (for renewable energies).

**Brazil** recorded an organic decline of €53 million in EBITDA, largely attributable to two major scheduled shutdowns at the Norte Fluminense plant in the first half of 2012 and the exceptionally high level of exports in 2011.

1. Further details of this breakdown can be found in section 9.3.1.2.1.

2. Concerning gas years from October 2010 to September 2012.

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EBITDA in the **United States** also showed an organic decline (-€27 million), explained by the lower margin achieved by CENG due to falling market prices for electricity, and the higher number of days of scheduled and unscheduled shutdowns in 2012 compared to 2011. This decline is partly offset by limitation of expenditure on UniStar's Calvert Cliffs 3 project with a view to obtaining the NRC construction and operating licence, and optimisation of structural costs in the holding company EDF Inc.

EBITDA in **Belgium** registered an organic decline of €16 million, reflecting the unfavourable effects of new regulation mechanisms that came into force in 2012 (presented in section 9.2.2.4.2), and the shutdown of the Doel 3 and Tihange 2 power plants.

## 9.3.2.2.5 Other activities

**Other activities** contributed €2,014 million to Group EBITDA for 2012, €85 million more than in 2011, with organic growth of +4.7%.

**EDF Énergies Nouvelles'** contribution to consolidated EBITDA stood at €642 million. The organic increase of 20.6% compared to 2011 was driven by development of Generation (with higher wind and solar power output in Europe and North America due to the large number of facilities commissioned in 2011 and 2012, and favourable weather conditions), and by a good level of business in Development-Sales of Structured Assets activities.

EBITDA at **EDF Trading** was down by 20.1% compared to 2011, reflecting changes in the trading margin (for details see section 9.3.1.2.5).

**Dalkia's** EBITDA saw an organic decline of €22 million (-8.9%), due to the sluggish business environment in Italy.

EBITDA for this segment also benefited from the favourable effect of real estate operations, and renegotiations of insurance contracts.

## 9.3.3 Operating profit (EBIT)

EBIT declined by 2.4%.

(In millions of Euros)	2012	2011 restated	Variation	Variation (%)
<b>EBITDA</b>	<b>16,084</b>	<b>14,939</b>	<b>1,145</b>	<b>+7.7</b>
Net changes in fair value on Energy and Commodity derivatives, excluding trading activities	(69)	(116)	47	-40.5
Net depreciation and amortisation	(6,849)	(6,285)	(564)	+9.0
Net increases in provisions for renewal of property, plant and equipment operated under concessions	(164)	(221)	57	-25.8
(Impairment)/reversals	(752)	(640)	(112)	+17.5
Other income and expenses	(5)	775	(780)	-100.6
<b>OPERATING PROFIT (EBIT)</b>	<b>8,245</b>	<b>8,452</b>	<b>(207)</b>	<b>-2.4</b>

The Group's consolidated **EBIT** amounted to €8,245 million for 2012, €207 million lower than in 2011. The main factors in this change were the lower level of other income and expenses, and higher net depreciation and amortisation, which were partly offset by the positive development in EBITDA.

### 9.3.3.1 Net changes in fair value on energy and commodity derivatives, excluding trading activities

The net changes in fair value on Energy and Commodity derivatives, excluding trading activities, rose from -€116 million in 2011 to -€69 million in 2012. Positive changes were mainly located in the **Other International** segment (Belgium) and the **Other activities**.

### 9.3.3.2 Net depreciation and amortisation

Net depreciation and amortisation was up by 9.0% from 2011.

**France** recorded higher net depreciation and amortisation (+€287 million) as major nuclear plant components were replaced and new investments were made for plants in operation, despite the favourable effect of the change in estimate concerning the operating lifetime of certain distribution assets.

In the **United Kingdom**, net depreciation and amortisation for 2012 benefited from a favourable €225 million effect related to the longer operating lifetimes of AGR<sup>1</sup> nuclear plants, which were extended by 5 years and 7 years compared to the expected operating lifetimes when EDF took over British Energy in January 2009.

In **Italy**, the higher hydrocarbon generation volumes at Edison led to a rise in amortisation and depreciation expenses. In the Exploration-Production sector, Edison continued exploring in Norway and the Falkland Islands, and made two discoveries in Norway covering an estimated 18 billion m<sup>3</sup> of gas reserves (in which Edison holds a 20% share). The related exploration costs were charged to expenses for the year.

At **EDF Énergies Nouvelles**, commissioning of new generation facilities caused a €58 million increase in net depreciation and amortisation.

1. Advanced gas-cooled reactors.

### 9.3.3.3 Net increases in provisions for renewal of property, plant and equipment operated under concessions

The €57 million decrease in net increases in provisions for renewal of property, plant and equipment operated under concessions between 2011 and 2012 is essentially attributable to ERDF.

### 9.3.3.4 Impairment/reversals

In 2011, impairment of €640 million was recorded, concerning Edison in **Italy** (€320 million, including €280 million for Edipower), the **Other activities** segment (€267 million), and the **Other International** segment with BE ZRt in Hungary (€53 million).

In 2012, impairment of €752 million was recorded, chiefly concerning CENG in the United States (**Other international** segment; €396 million) due to the less favourable outlook for forward electricity prices, the **United Kingdom** (€234 million) for fossil-fired plants, and Edison in **Italy** (€44 million).

### 9.3.3.5 Other income and expenses

Other income and expenses totalled a net expense of €5 million in 2012 compared to net income of €775 million in 2011. In 2011, other income and expenses comprised the positive €414 million impact of changes in the estimated useful lives of certain French public distribution facilities on the provision for renewal, and the €327 million gain on sale of EnBW.

In 2011, the main components of other income and expenses were:

- a net expense of €(70) million resulting from upward revision of the estimated costs for decommissioning permanently shut-down nuclear power plants in France (UNGG power plants, Creys-Malville, Brennilis and Chooz A), and the revision of certain costs related to interim storage of spent fuel;
- income of €160 million concerning ERDF, resulting from reversal of a provision for renewal following a change in estimate for the useful life of high/low voltage transformers (extended from 30 years to 40 years);
- also, application of IFRS 3 (revised) led to recognition of the following items in Other income and expenses in connection with the takeover of Edison:
  - a loss of €1,090 million on the previously-held investment,
  - negative goodwill of €1,023 million.

## 9.3.4 Financial result

<i>(In millions of Euros)</i>	2012	2011 restated	Variation	Variation (%)
Cost of gross financial indebtedness	(2,443)	(2,271)	(172)	+7.6
Discount effect	(3,285)	(3,064)	(221)	+7.2
Other financial income and expenses	2,366	1,555	811	+52.2
<b>FINANCIAL RESULT</b>	<b>(3,362)</b>	<b>(3,780)</b>	<b>418</b>	<b>-11.1</b>

The financial result for 2012 is a financial expense of €3,362 million, down by €418 million from 2011 as a result of the following:

- cost of gross financial indebtedness: the 7.6% increase is related to the rise in the Group's average gross debt;
- discount effect: the €221 million rise in discount expenses is mainly explained by revision of the discount rate used for nuclear provisions

in France, partly counterbalanced by a reversal of discount expenses on partner advances reimbursed by EDF to Enel in late 2012 after Enel withdrew from the Flamanville 3 project (€101 million);

- other financial income and expenses: the favourable change derives from the financial income of €629 million in compensation for the cost of bearing the accumulated shortfall in the CSPE system, and optimisation of cash and liquid assets.

### 9.3.5 Income taxes

Income taxes amounted to €1,586 million in 2012, corresponding to an effective tax rate of 32.5%. The effective tax rate was 28.6% in 2011.

The main causes of the rise in the effective tax rate between 2011 and 2012 are the new finance laws in France, and the favourable effect of low taxation of the gain on sale of the Group's investment in EnBW in 2011, which had no equivalent in 2012.

### 9.3.6 Share in income of associates

The Group's share in income of associates was a positive €260 million in 2012, compared to €51 million for 2011. This increase is mainly due to growth in RTE's net income compared to 2011, and recognition of impairment on Alpiq in 2012, which was lower than the corresponding impairment booked in 2011.

### 9.3.7 Net income attributable to non-controlling interests

Net income attributable to non-controlling interests amounted to €241 million for 2012, stable compared to 2011.

### 9.3.8 EDF net income

EDF net income for 2012 was €3,316 million, up by €168 million or 5.3% compared to 2011.

### 9.3.9 Net income excluding non-recurring items

The Group's net income excluding non-recurring items<sup>1</sup> stood at €4,216 million for 2012, €609 million (16.9%) higher than 2011.

1. Group net after-tax income excluding non-recurring items and net changes in fair value on Energy and Commodity derivatives, excluding trading activities, net of tax.

Non-recurring items and net changes in fair value on Energy and Commodity derivatives, excluding trading activities, net of tax in 2012 (-€900 million) mainly comprised:

- -€856 million for impairment and updating of provisions (especially nuclear provisions);
- -€44 million of net changes in fair value on Energy and Commodity derivatives, excluding trading activities.

Non-recurring items and net changes in fair value on Energy and Commodity derivatives, excluding trading activities, net of tax in 2011 amounted to -€459 million, mostly comprising impairment and the gain on disposal of EnBW.



## 9.4 Cash flows and net financial indebtedness

### 9.4.1 Cash flows

(in millions of Euros)	2012	2011 restated	Variation	Variation (%)
Net cash flow from operating activities	9,924	8,497	1,427	+16.8
Net cash flow used in investing activities	(14,410)	(6,791)	(7,619)	+112.2
Net cash flow from financing activities	4,657	(1,591)	6,248	n.a.
<b>NET INCREASE/(DECREASE) IN CASH AND CASH EQUIVALENTS</b>	<b>171</b>	<b>115</b>	<b>56</b>	<b>+48.7</b>
Cash and cash equivalents - opening balance	5,743	5,567	176	+3.2
Effect of currency fluctuations	(44)	54	(98)	n.a.
Financial income on cash and cash equivalents	38	44	(6)	-13.6
Effect of reclassifications	(34)	(37)	3	-8.1
<b>CASH AND CASH EQUIVALENTS - CLOSING BALANCE</b>	<b>5,874</b>	<b>5,743</b>	<b>131</b>	<b>+2.3</b>

n.a. = not applicable.

#### 9.4.1.1 Net cash flow from operating activities

(in millions of Euros)	2012	2011 restated	Variation	Variation (%)
Income before taxes of consolidated companies	4,883	4,672	211	+4.5
(Impairment)/Reversals	752	640	112	+17.5
Accumulated depreciation and impairment, provisions and change in fair value	9,197	7,210	1,987	+27.6
Financial income and expenses	944	1,117	(173)	-15.5
Dividends received from associates	201	334	(133)	-39.8
Capital gains/losses	(443)	(737)	294	-39.9
Change in working capital	(2,390)	(1,785)	(605)	+33.9
<b>Net cash flow from operations</b>	<b>13,144</b>	<b>11,451</b>	<b>1,693</b>	<b>+14.8</b>
Net financial expenses disbursed	(1,634)	(1,623)	(11)	+0.7
Income taxes paid	(1,586)	(1,331)	(255)	+19.2
<b>NET CASH FLOW FROM OPERATING ACTIVITIES</b>	<b>9,924</b>	<b>8,497</b>	<b>1,427</b>	<b>+16.8</b>

The net cash flow from operating activities amounted to €9,924 million in 2012, a €1,427 million increase from 2011.

This change primarily reflects a €1,693 million increase in the net cash flow from operations, explained by the following factors:

- essentially the income before taxes from consolidated companies after adjustment for impairment (reversals), depreciation and amortisation, provisions and changes in fair value, which amounted to a total €14,832 million in 2012 compared to €12,522 million in 2011 (a €2,310 million increase);

- to a lesser extent, the effect of capital gains on disposals recognized in 2012, which were lower than in 2011 when they included the gain on sale of EnBW in particular;
- these effects are partly counterbalanced by the lower level of dividends received from associates (€133 million) and the increase in working capital (€605 million), chiefly attributable to the rise in the CSPE receivable.

The variation in the net cash flow from operating activities also reflects the higher amount of income taxes paid (€255 million), particularly in France due to the higher taxable income under the French tax consolidation system and the impact of new finance laws.

## 9.4.1.2 Net cash flow used in investing activities

Net cash outflows for investing activities amounted to €14,410 million in 2012, compared to €6,791 million in 2011.

The following table sets forth the breakdown of the net cash flow used in investing activities between purchases and disposals of property, plant and equipment and intangible assets, acquisitions and disposals of companies net of cash acquired/transferred, and the change in financial assets:

(in millions of Euros)	2012	2011 restated	Variation	Variation (%)
Investments in intangible assets and property, plant and equipment	(13,386)	(11,134)	(2,252)	+20.2
Net proceeds from sale of intangible assets and property, plant and equipment	748	497	251	+50.5
<b>Net Capex<sup>(1)</sup></b>	<b>(12,638)</b>	<b>(10,637)</b>	<b>(2,001)</b>	<b>+18.8</b>
Investments, net of cash acquired/transferred	20	3,624	(3,604)	-99.4
Changes in financial assets	(1,792)	222	(2,014)	n.a.
<b>NET CASH FLOW USED IN INVESTING ACTIVITIES</b>	<b>(14,410)</b>	<b>(6,791)</b>	<b>(7,619)</b>	<b>+112.2</b>

n.a. = not applicable.

(1) In managing its industrial investments, the Group uses the net Capex indicator ("Investments in intangible assets and property, plant and equipment" net of "Net proceeds from sale of intangible assets and property, plant and equipment") in order to monitor changes in its investments in tangible and intangible assets.

## Investments in intangible assets and property, plant and equipment

Operating investments amounted to €13,386 million in 2012, €2,252 million higher than in 2011 (+20.2%).

Changes in the Group's gross capital expenditure over the period were as follows:

(in millions of Euros)	2012	2011 restated	Variation	Variation (%)
Deregulated activities	4,383	3,896	487	+12.5
Network activities	3,073	2,754	319	+11.6
Island activities	779	728	51	+7.0
<b>France</b>	<b>8,235</b>	<b>7,378</b>	<b>857</b>	<b>+11.6</b>
United Kingdom	1,643	1,179	464	+39.4
Italy	438	318	120	+37.7
Other International	490	436	54	+12.4
<b>Total International</b>	<b>2,571</b>	<b>1,933</b>	<b>638</b>	<b>+33.0</b>
<b>Total Other Activities</b>	<b>2,580</b>	<b>1,823</b>	<b>757</b>	<b>+41.5</b>
<b>OPERATING INVESTMENTS (GROSS CAPEX)</b>	<b>13,386</b>	<b>11,134</b>	<b>2,252</b>	<b>+20.2</b>

Gross capital expenditure in **France** rose by €857 million or 11.6%. For the deregulated activities, the increase was concentrated in nuclear maintenance (€570 million), principally for asset maintenance, as expenditure to enhance the nuclear units' performance led to an increase in the amounts capitalized in 2012. The reinforced management plan improved monitoring of normal maintenance expenditure and scheduled regular checks, which qualify as major inspections and are capitalized accordingly.

In the network activities, the observed increase was largely explained by ERDF's investments in connections for customers (€125 million) and the quality of supply (€106 million). For the island activities, the increase is attributable to investments in new production capacities under construction in Upper Corsica and Guadeloupe (Pointe Jarry).

In the **United Kingdom**, gross capital expenditure was up by €464 million (+39.4%), mainly as a result of the higher investments in development of the New nuclear program and renewable energies.

In **Italy**, the €120 million increase in gross capital expenditure (+37.7%) principally concerned Edison and chiefly corresponds to changes in the scope of consolidation after EDF took control of Edison in May 2012. Excluding this scope effect (amounting to approximately €192 million), Edison's capital expenditure was down by €77 million, reflecting the net decrease in investments in electricity activities (-€89 million).

In the **Other International** segment, gross capital expenditure was €54 million higher in 2012 than in 2011, primarily in Poland.

Gross capital expenditure in the **Other activities** was up by €757 million or 41.5%. This change was mainly driven by higher investments by EDF Énergies Nouvelles (€714 million) to expand its generation fleet and subsequently sell part of the fleet on in the form of structured assets.

## Investments, net of cash acquired/transferred

In 2012, this item principally included the income on the sale of the Eggborough plant in the United Kingdom and the acquisition price of Enerest. In 2011, it mainly included the €3,762 million gain on the sale of EnBW.

## Changes in financial assets

The change in financial assets in 2012 was -€1,792 million, compared to €222 million in 2011. The increase in 2012 principally concerned EDF and is attributable to acquisitions of liquid assets (€1,224 million) and cash allocations to dedicated assets amounting to €737 million.

### 9.4.1.3 Net cash flow from financing activities

(in millions of Euros)	2012	2011 restated	Variation	Variation (%)
Transactions with non-controlling interests	(1,038)	(1,324)	286	-21.6
Dividends paid by parent company	(2,125)	(2,122)	(3)	+0.1
Dividends paid to non-controlling interests	(230)	(261)	31	-11.9
Purchases/sales of treasury shares	(15)	(14)	(1)	+7.1
<b>Cash flows with shareholders</b>	<b>(3,408)</b>	<b>(3,721)</b>	<b>313</b>	<b>-8.4</b>
Issuance of borrowings	12,431	5,846	6,585	+112.6
Repayment of borrowings	(4,869)	(4,071)	(798)	+19.6
Funding contributions received for assets operated under concessions	190	194	(4)	-2.1
Investment subsidies	313	161	152	+94.4
<b>Other cash flows from financing activities</b>	<b>8,065</b>	<b>2,130</b>	<b>5,935</b>	<b>n.a.</b>
<b>NET CASH FLOW FROM FINANCING ACTIVITIES</b>	<b>4,657</b>	<b>(1,591)</b>	<b>6,248</b>	<b>n.a.</b>

n.a. = not applicable.

In 2012, the cash flows related to financing activities generated a net inflow of €4,657 million, a €6,248 million increase from 2011. This change primarily reflects:

- A lower level of transactions with non-controlling interests in 2012, resulting from the acquisition of additional interests in the Edison group (€869 million) and ERSA, following EDF's acquisition of EnBW's investment in the Polish subsidiary (€252 million).
- Dividends paid out in cash by EDF SA, which were stable in 2012 compared to 2011.
- Issuance of borrowings net of repayment, which were up by €5,787 million, reflecting several bond issues in a context of higher capital expenditures and the takeover of Edison. These issues reduced the average cost of the Group's gross indebtedness.

### 9.4.2. Net indebtedness

Net indebtedness comprises total loans and financial liabilities, less cash and cash equivalents and liquid assets. Liquid assets are financial assets consisting of funds or securities with initial maturity of over three months that are readily convertible into cash regardless of their maturity and are managed according to a liquidity-oriented policy. The definition of net indebtedness was revised in 2012 and now includes the Group's loans to RTE and joint ventures.

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## Cash flows and net financial indebtedness

Changes in the Group's net indebtedness were as follows:

(in millions of Euros)	2012	2011 restated <sup>(4)</sup>	Variation	Variation (%)
<b>Operating profit before depreciation and amortisation (EBITDA)</b>	<b>16,084</b>	<b>14,939</b>	<b>1,145</b>	<b>+7.7</b>
Cancellation of non-monetary items included in EBITDA	(715)	(2,040)	1,325	
Net financial expenses disbursed	(1,634)	(1,623)	(11)	
Income taxes paid	(1,586)	(1,331)	(255)	
Other items	165	336	(171)	
<b>Net cash flow from operations<sup>(1)</sup></b>	<b>12,314</b>	<b>10,281</b>	<b>2,033</b>	<b>+19.8</b>
Change in working capital	(2,390)	(1,121)	(1,269)	
Net operating investments (gross CAPEX less disposals)	(12,638)	(10,637)	(2,001)	
<b>Free cash flow</b>	<b>(2,714)</b>	<b>(1,477)</b>	<b>(1,237)</b>	
Allocation to dedicated assets, France	(737)	(315)	(422)	
Net financial investments	(1,021)	3,277	(4,298)	
Dividends paid	(2,355)	(2,383)	28	
Other changes <sup>(2)</sup>	365	8	357	
<b>(Increase)/decrease in net indebtedness, excluding the impact of changes in scope of consolidation and exchange rates</b>	<b>(6,462)</b>	<b>(890)</b>	<b>(5,572)</b>	
Effect of change in scope of consolidation	(1,870)	2,607	(4,477)	
Effect of change in exchange rates	(137)	(516)	379	
Effect of other non-monetary changes <sup>(3)</sup>	179	(97)	276	
<b>(Increase)/decrease in net indebtedness</b>	<b>(8,290)</b>	<b>1,104</b>	<b>(9,394)</b>	
<b>NET INDEBTEDNESS AT BEGINNING OF PERIOD</b>	<b>33,285</b>	<b>34,389</b>		
<b>NET INDEBTEDNESS AT END OF PERIOD</b>	<b>41,575</b>	<b>33,285</b>		

- (1) Operating cash flow is not an aggregate defined by IFRS as a measure of financial performance, and is not directly comparable with indicators of the same name reported by other companies. This indicator, also known as Funds From Operations (FFO), is equivalent to net cash flow from operating activities excluding changes in working capital after adjustment for the impact of non-recurring items, less net financial expenses disbursed and income taxes paid.
- (2) Principally capital increases subscribed by minority shareholders, changes in accrued interest on debt, contributions received on assets operated under concession, investment subsidies and the full and final payment to Areva for dismantling La Hague (the last payment was made in June 2011 and amounted to €664 million plus taxes).
- (3) Mainly corresponds to changes in fair value and accounting reclassifications affecting net indebtedness.
- (4) Figures for 2011 have been restated for the impact of the change in accounting method for actuarial gains and losses on post-employment benefits: the restatements to "EBITDA" and "Cancellation of non-monetary items included in EBITDA" amount to +€115 million and -€115 million respectively.

The Group's net indebtedness stood at €41,575 million at 31 December 2012 compared to €33,285 million at 31 December 2011, an increase of €8,290 million over the year.

The Group's free cash flow at 31 December 2012 was negative at -€2,714 million: this included net operating investments of -€12,638 million financed to the extent of €12,314 million by operating cash flow, and a variation of -€2,390 million in working capital.

The allocation to dedicated assets for 2012 amounted to €737 million. This is €422 million higher than in 2011 because allocations to the dedicated asset portfolio were suspended with the approval of the Board of Directors from September 2011 to December 2011, due to market conditions. Allocations resumed at the start of 2012, at a slightly faster pace in view of the dedicated asset portfolio's lower value at 31 December 2011.

Net financial investments for 2012 (excluding allocations to dedicated assets) amounted to €1,021 million, and mainly concern the following operations:

- the takeover of Edison (-€969 million);

- purchase of the shares in ERSa and Kogeneracja held by EnBW (-€301 million);
- sale of all the shares in Exelon (+€361 million);
- receipt of the sale price of the Eggborough coal-fired plant (+€261 million);
- the takeover of Enerest by Electricité de Strasbourg (-€139 million).

Dividends paid in cash (€2,355 million) comprise the balance of the 2011 dividends (€1,072 million), the interim dividend for 2012 (€1,053 million) and the dividends paid by Group subsidiaries to their minority shareholders (€230 million), principally Centrica in the UK (€117 million).

In 2012, the scope effect mainly reflects the Edison operations (-€2,290 million) and the exclusion from net indebtedness of companies sold by EDF Énergies Nouvelles as part of its Development and Sale of Structured Assets business.

The foreign exchange effect (essentially appreciation of the pound sterling and the decline of the US dollar against the Euro<sup>1)</sup> had an overall unfavourable impact of -€137 million on the Group's net financial indebtedness.

1. The US dollar fell by 1.9% against the Euro, from €0.7729/\$1 at 31 December 2011 to €0.7579/\$1 at 31 December 2012. The pound sterling rose by 2.4% against the Euro, from €1.1972/£1 at 31 December 2011 to €1.2253/£1 at 31 December 2012.

## 9.5 Management and control of market risks

### 9.5.1 Management and control of financial risks

This chapter sets forth the policies and principles for management of the Group's financial risks defined in the Financial Management Framework (liquidity, interest rate, foreign exchange rate and equity risks), and the Group counterparty risk management policy set up by the EDF group. These principles apply only to EDF and operationally controlled subsidiaries or subsidiaries that do not benefit by law from specific guarantees of independent management (i.e. entities other than RTE and ERDF). In compliance with IFRS 7, the following paragraphs describe the nature of risks resulting from financial instruments, based on analyses of sensitivities and credit (counterparty) risks.

In view of the Group's international development, a dedicated body was formed at the beginning of 2002 – the Financial Risks Control Division (*Département Contrôle des Risques Financiers et Investissements* – DCRFI) – to control financial risks at Group level by ensuring correct application of the principles of the Financial Management Framework. This body also has the task of carrying out a second-level check (methodology and organisation) of EDF entities and operationally controlled group subsidiaries (excluding RTE and ERDF), and a first-level check of financing activities at parent company level, including Trading room activities.

The DCRFI issues daily monitoring reports of risk indicators relevant to activities in EDF's Trading room.

Regular internal audits are carried out to ensure controls are actually applied and are effective.

### 9.5.1.1 Liquidity position and management of liquidity risks

#### 9.5.1.1.1 Liquidity position

At 31 December 2012, the Group's liquidities, consisting of liquid assets, cash and cash equivalents, totalled €16,613 million and available credit lines amounted to €8,598 million.

For 2013, the Group's scheduled debt repayments (principal and interest) are forecast at €15,139 million at 31 December 2012, including €5,989 million for bonds.

At 31 December 2012, no Group company was in default on any borrowing.

#### 9.5.1.1.2 Management of liquidity risks

As part of its policy to manage liquidity, finance its operating investment and external growth programme and reinforce long-term debt, the Group undertook bond issues during 2012 (for details see note 38.2.1 to the consolidated financial statements at 31 December 2012, "Changes in loans and other financial liabilities". These bonds were issued either as part of EMTN (Euro Medium Term Note) programmes, or as stand-alone issues, for the total amount of €5,204 million and £750 million.

The average maturity of gross consolidated debt was thus 8.5 years at 31 December 2012 compared to 9.2 years at 31 December 2011, and EDF SA debt now has average maturity of 9.6 years compared to 10.4 years at 31 December 2011.

At 31 December 2012, the residual maturities of financial liabilities (including interest payments) are as follows under IAS 39 (values based on exchange and interest rates at 31 December 2012):

	Debt	Hedging instruments <sup>(1)</sup>		Guarantees given on bonds
		Interest rate swaps	Currency swaps	
(In millions of Euros)				
2013	15,139	(145)	64	11
2014-2017	20,449	(609)	109	40
2018 and later	50,572	(1,748)	(49)	167
<b>TOTAL</b>	<b>86,160</b>	<b>(2,501)</b>	<b>124</b>	<b>218</b>
Incl. debt repayment	58,592			
Incl. interest expense	27,568			

(1) Data on hedging instruments include both assets and liabilities.



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## Management and control of market risks

The EDF group was able to meet its financing needs by conservative liquidity management, and obtained financing on satisfactory terms.

A range of specific levers are used to manage the Group's liquidity risk:

- the Group's cash pooling system, which centralises cash management for controlled subsidiaries. The subsidiaries' cash balances are made available to EDF SA in return for interest, so as to optimise the Group's cash management and provide subsidiaries with a system that guarantees them market-equivalent financial terms. Edison is now part of the Group's cash pooling;
- centralisation of financing for controlled subsidiaries at the level of the Group's cash management department. Changes in subsidiaries' working capital are financed by this department in the form of stand-by credit lines provided for subsidiaries, which may also receive revolving credit from the Group. The investment subsidiary EDF Investissements Groupe (EDF IG), set up in partnership with the bank Natixis Belgique Investissements, also provides medium and long-term financing for EDF group operations outside France, arranged independently by EDF IG. The company sets its own terms, which are the same as the subsidiary would have in an arm's-length market transaction;

- active management and diversification of financing sources used by the Group: the Group has access to short-term resources on various markets through programmes for French commercial paper (*billets de trésorerie*), US commercial paper and Euro market commercial paper. For EDF SA, the ceilings for these programmes are €6 billion for its French commercial paper, \$10 billion for its US commercial paper and \$1.5 billion for its Euro market commercial paper.

At 31 December 2012 the amount of commercial paper outstanding was €1,620 million for French commercial paper, and \$4,493 million for US commercial paper. No Euro market commercial paper was outstanding.

EDF has access to the world's main capital markets: the Euro markets through its EMTN (Euro Medium Term Note) programme, which currently has a ceiling of €20 billion, particularly for Euro and sterling issues; and the domestic markets used for stand-alone issues in US dollars (144A), yen (samurai bonds) and Swiss francs.

The table below sets forth the Group's borrowings of more than €750 million or the equivalent value in other currencies by maturity at 31 December 2012:

Entity	Issue date <sup>(1)</sup>	Maturity	Nominal amount (in millions of currency units)	Currency	Rate
EDF	11/2008	01/2013	2,000	EUR	5.6%
EDF	12/2008	12/2013	1,350	CHF	3.4%
EDF	01/2009	01/2014	1,250	USD	5.5%
EDF	07/2009	07/2014	3,269	EUR	4.5%
EDF	01/2009	01/2015	2,000	EUR	5.1%
EDF	10/2001	10/2016	1,100	EUR	5.5%
EDF	02/2008	02/2018	1,500	EUR	5.0%
EDF	01/2009	01/2019	2,000	USD	6.5%
EDF	01/2010	01/2020	1,400	USD	4.6%
EDF	05/2008	05/2020	1,200	EUR	5.4%
EDF	01/2009	01/2021	2,000	EUR	6.3%
EDF	01/2012	01/2022	2,000	EUR	3.9%
EDF	09/2012	03/2023	2,000	EUR	2.8%
EDF	09/2009	09/2024	2,500	EUR	4.6%
EDF	11/2010	11/2025	750	EUR	4.0%
EDF	03/2012	03/2027	1,000	EUR	4.1%
EDF	04/2010	04/2030	1,500	EUR	4.6%
EDF	07/2001	07/2031	650	GBP	5.9%
EDF	02/2003	02/2033	850	EUR	5.6%
EDF	06/2009	06/2034	1,500	GBP	6.1%
EDF	01/2009	01/2039	1,750	USD	7.0%
EDF	11/2010	11/2040	750	EUR	4.5%
EDF	10/2011	10/2041	1,250	GBP	5.5%
EDF	09/2010	09/2050	1,000	GBP	5.1%

(1) Date funds were received.

EDF and Edison have credit facilities at 31 December 2012 that can be used in the event of liquidity problems, with the following characteristics:

- EDF has an overall amount of €7,950 million in available credit facilities (syndicated credit and bilateral lines). Credit lines represent an available amount of €3,950 million, with expiry dates between January 2015 and June 2017; syndicated credit facilities amount to €4,000 million for maturities ranging from November 2015 to November 2017. The level of these facilities is very regularly reviewed to ensure that the Group has sufficient back-up facilities. No drawings had been made on syndicated credit facilities at 31 December 2012.

EDF also has a €500 million credit line with the European Investment Bank, which was totally drawn at 31 December 2012 (drawings of €100 million in 2010, €350 million in 2011, and €50 million in 2012).

- Edison has a syndicated credit facility for €1,500 million (valid until 14 April 2013), drawn to the extent of €1,150 million at 31 December 2012. The €700 million "Club deal" previously available expired at the end of 2012.

## 9.5.1.2 Credit ratings

The financial ratings agencies Standard & Poor's, Moody's and Fitch Ratings attributed the following long-term and short-term ratings to EDF group entities at 31 December, 2012:

Company	Agency	Long-term rating	Short-term rating
EDF	Standard & Poor's	A+, stable outlook	A-1
	Moody's	Aa3, creditwatch negative <sup>(1)</sup>	P-1
	Fitch Ratings	A+, stable outlook	F1
RTE	Standard & Poor's	A+, stable outlook	A-1
EDF Trading	Moody's	A3, creditwatch negative <sup>(2)</sup>	n.a.
EDF Energy	Standard & Poor's	A, negative outlook	A-1
	Moody's	A3, negative outlook <sup>(3)</sup>	P-2
	Fitch Ratings	n.a.	n.a.
Edison SpA	Standard & Poor's	BBB, positive outlook <sup>(4)</sup>	A-2
	Moody's	Baa3, creditwatch negative	n.a.
	Fitch Ratings	BB, positive outlook <sup>(5)</sup>	B

n.a. = not applicable

(1) Moody's downgraded the outlook for EDF from stable to negative on 5 December 2012 after the Council of State's decision to cancel the 2009 decision on electricity tariffs. The negative outlook also reflects the rise in Group indebtedness and uncertainty over profitability for 2013.

(2) Downgraded by Moody's on 5 December 2012, along with the EDF group.

(3) Downgraded by Moody's on 5 December 2012, along with the EDF group.

(4) S&P upgraded Edison's rating from BB+ to BBB on 20 December 2012 following EDF's takeover of Edison, renegotiation of gas contracts and sale of an investment in Edipower, which all improved Edison's cash flow and credit ratios.

(5) Fitch upgraded Edison's rating from BB- to BB on 13 August 2012 following EDF's takeover of the Edison group.

## 9.5.1.3 Management of foreign exchange risk

Due to the diversification of its activities and geographical locations, the Group is exposed to the risk of exchange rate fluctuations, which may have an impact on the translation differences affecting balance sheet items, Group financial expenses, equity and net income.

To limit exposure to foreign exchange risks, the Group has introduced the following management principles:

- local currency financing: To the extent possible given the local financial markets' capacities, each entity finances its activities in its own accounting currency. When financing is contracted in other currencies, derivatives may be used to limit foreign exchange risks;
- association of assets and liabilities: the net assets of subsidiaries located outside the Euro zone expose the Group to a foreign exchange risk. The foreign exchange risk in the consolidated balance sheet is managed either by matching with liabilities for acquisitions in the same currency,

or by market hedging involving use of financial derivatives. Hedging of net assets in foreign currencies complies with risk/return targets, and the hedging rate varies from 73% to 92% depending on the currency. If no hedging instruments are available, or if hedging costs are prohibitive, the foreign exchange positions remain open and the risk on such positions is monitored by sensitivity calculations;

- hedging of operating cash flows in foreign currencies: in general, the operating cash flows of EDF and its subsidiaries are in the relevant local currencies, with the exception of flows related to fuel purchases which are primarily in US dollars, and certain flows related to purchases of equipment, which concern lower amounts. Under the principles of the financial management framework, EDF and the main subsidiaries concerned by foreign exchange risks (EDF Energy, EDF Trading, Edison, EDF Énergies Nouvelles) are required to hedge firm or highly probable commitments related to these future operating cash flows.

After taking into account the financing and foreign exchange risk hedging policy, the Group's gross debt at 31 December 2012 breaks down as follows by currency after hedging:

## Gross debt structure at 31 December 2012, by currency, before and after hedging

31 December 2012 (In millions of Euros)	Initial debt structure	Impact of hedging instruments <sup>(1)</sup>	Debt structure after hedges	% of debt
EUR	35,709	1,485	37,194	62%
USD	11,621	(6,240)	5,381	9%
GBP	7,927	5,773	13,700	23%
Other currencies	4,675	(1,018)	3,657	6%
<b>TOTAL</b>	<b>59,932</b>	<b>-</b>	<b>59,932</b>	<b>100%</b>

(1) Hedges of liabilities and net assets of foreign subsidiaries.

The table below presents the impact on equity of an unfavourable variation in exchange rates on the group's gross debt at 31 December 2012.

## Sensitivity of the Group's gross debt to foreign exchange rate risks

31 December 2012 (In millions of Euros)	Debt after hedging instruments converted into Euros	Impact of a 10% unfavourable variation in exchange rates	Debt after a 10% unfavourable variation in exchange rates
EUR	37,194	-	37,194
USD	5,381	538	5,919
GBP	13,700	1,370	15,070
Other currencies	3,657	366	4,023
<b>TOTAL</b>	<b>59,932</b>	<b>2,274</b>	<b>62,206</b>

Due to the Group's foreign exchange risk hedging policy for liabilities, the income statement for companies controlled by the Group is marginally exposed to foreign exchange rate risks.

The table below sets forth the foreign exchange position relating to net non-operating investments in foreign currency of the Group's principal subsidiaries at 31 December 2012.

## Net asset position

31 December 2012 (In millions of currency)	Assets	Bonds	Derivatives	US CP	Net position after management (Assets)
USD	5,186	4,000	756	-	430
CHF (Switzerland)	1,779	1,306			473
HUF (Hungary)	130,053		95,295		34,758
PLN (Poland)	3,517		2,648		869
GBP (United Kingdom)	14,139	6,035	4,915		3,189
BRL (Brazil)	626				626
CNY (China)	5,870				5,870

The assets in the above table are the net assets of the Group's foreign subsidiaries in foreign currencies at 30 September 2012, adjusted for changes in the fair value of cash flow hedges and available-for-sale financial assets recorded in equity, and changes in the fair value of financial instruments recorded in income at 31 December 2012. The hedges shown above are bonds, derivatives and commercial paper issues in foreign currencies outstanding at 31 December 2012.

The following table sets forth the risk of foreign exchange loss in equity on the overall net position relating to the net non-operating investments in foreign currencies of the Group's principal subsidiaries at 31 December 2012, assuming unfavourable, uniform exchange rate variations of 10% against the Euro. Net positions are converted at the closing rate and impacts are reported in absolute value.

## Sensitivity of net assets to exchange rate risks

	31 December 2012			31 December 2011		
	Net position after management, in currency	Net position after management, converted into Euros	Impact on equity of a 10% variation in exchange rates	Net position after management, in currency	Net position after management, converted into Euros	Impact on equity of a 10% variation in exchange rates
<i>(In millions of currency)</i>						
USD	430	326	32	548	424	42
CHF (Switzerland)	473	392	39	495	407	40
HUF (Hungary)	34,758	119	12	33,659	107	12
PLN (Poland)	869	213	21	767	172	17
GBP (United Kingdom)	3,189	3,908	391	2,853	3,416	341
BRL (Brazil)	626	232	23	692	286	29
CNY (China)	5,870	714	71	5,790	710	71

The foreign exchange risk on available-for-sale securities is mostly concentrated in EDF SA's dedicated asset portfolio, which is discussed in section 9.5.1.6, "Management of financial risk on EDF's dedicated asset portfolio".

The foreign exchange risk associated with short-term investments and operating liabilities in foreign currencies remains restricted for the Group at 31 December 2012.

### 9.5.1.4 Management of interest rate risk

The exposure of the Group's cash positions to interest rate fluctuations covers two types of risk: a risk of change in the value of fixed-rate financial assets and liabilities, and a risk of change in the cash flows related to floating-rate financial assets and liabilities.

To limit exposure to interest rate risk, the Group (apart from entities it does not control operationally) fixes principles as part of its general risk management policy, designed to limit the risk of change in the value of

assets invested or possible increases in financial expenses. Some of the debt is variabilised and the distribution of exposure between fixed and floating rates is monitored with reference to asset/liability management criteria and expected fluctuations in interest rates. This distribution may involve the use of interest rate derivatives for hedging purposes.

The Group's debt after hedging instruments at 31 December 2012 comprised 79.2% of debt bearing interest at fixed rates and 20.8% at floating rates.

A 1% uniform annual rise in interest rates would generate an approximate €125 million increase in financial expenses at 31 December 2012, based on gross floating-rate debt after hedging.

The average cost of Group debt (weighted interest rate on outstanding amounts) was 3.7% in 2012.

The table below sets forth the structure of Group debt and the impact of a 1% variation in interest rates at 31 December 2012. The impact of interest rate fluctuations remains stable compared to 2011.

## Group debt structure and sensitivity to interest rates

31 December 2012 <i>(In millions of Euros)</i>	Initial debt structure	Impact of hedging instruments	Debt structure after hedges	Impact on income of a 1% variation in interest rates
Fixed rate	52,306	(4,844)	47,462	-
Floating rate	7,626	4,844	12,470	125
<b>TOTAL</b>	<b>59,932</b>	<b>-</b>	<b>59,932</b>	<b>125</b>

Interest rate variations on fixed-rate debt have no accounting impact.

Concerning financial assets, the table below presents the interest rate risk on floating-rate bonds and negotiable debt securities at EDF SA, and their sensitivity to interest rate risks (impact on net income).

## Sensitivity to interest rates of floating-rate instruments

31 December 2012 <i>(In millions of Euros)</i>	Value	Impact on income of a 1% variation in interest rates	Value after a 1% variation in interest rates
<b>FLOATING-RATE SECURITIES</b>	<b>1,633</b>	<b>(16)</b>	<b>1,617</b>

## 9.5.1.5 Management of equity risks

The equity risk is concentrated in the following areas:

### Coverage of EDF's nuclear obligations

Analysis of the equity risk is presented in section 9.5.1.6, "Management of financial risk on EDF's dedicated asset portfolio".

### Coverage of employee benefit commitments for EDF, EDF Energy and British Energy

Assets covering EDF's employee benefit liabilities are partly invested on the international and European equities markets. Market trends therefore affect the value of these assets, and a downturn in equity prices would lead to a rise in balance sheet provisions.

29% of the assets covering EDF's employee benefit liabilities were invested in equities at 31 December 2012, amounting to €2.4 billion.

At 31 December 2012, the two pension funds sponsored by EDF Energy (EDF Energy Pension Scheme and EDF Energy Group Electricity Supply Pension Scheme) were invested to the extent of 35.6% in equities, representing an amount of £286 million of equities.

At 31 December 2012, the British Energy pension funds were invested to the extent of 32.4% in equities, representing an amount of £1,260 million of equities.

### CENG fund

CENG is exposed to equity risks in the management of its funds established to cover nuclear and employee benefit obligations.

### EDF's long-term cash management

As part of its long-term cash management policy, EDF is continuing its strategy to reduce the portion of equity-correlated investments. At 31 December 2012 these investments amounted to a residual amount of approximately €3 million.

### Direct investments

At 31 December 2012, EDF's investment in Veolia Environnement amounted to €202 million, with estimated volatility of 37.3% (annualised volatility of monthly returns observed over three years).

At 31 December 2012, EDF's investment in AREVA amounted to €110 million, with estimated volatility of 37.6% (annualised volatility of monthly returns observed over three years).

## 9.5.1.6 Management of financial risk on EDF's dedicated asset portfolio

The dedicated assets have been built up progressively by EDF since 1999 to cover future decommissioning expenses for the nuclear plants currently in operation, and the long-term storage of radioactive waste.

This dedicated asset portfolio, for which guiding principles were redefined in the law of June 28, 2006 on sustainable management of radioactive materials and waste, is managed under the supervision of the Board of Directors and its Committees (Nuclear Commitments Monitoring Committee, Audit Committee).

The **Nuclear Commitments Monitoring Committee (CSEN)** is a specialised Committee set up by EDF's Board of Directors when it updated its internal rules on January 25, 2007, in anticipation of the provisions of article 9 of the decree of February 23, 2007.

A **Nuclear Commitments Financial Expertise Committee (CEFEN)** exists to assist the company and its governance bodies on questions of association of assets and liabilities and asset management. The members of this Committee

are independent of EDF. They are selected for their skills and diversity of experience, particularly in the fields of asset/liability management, economic and financial research, and asset management.

In 2012, **dedicated assets** received cash allocations of €737 million, compared to €315 million in 2011 (see note 48 to the consolidated financial statements at 31 December 2012).

**Disbursements** for decommissioning expenses incurred in 2012 were financed by the dedicated asset portfolio to the extent of €350 million, compared to €378 million in 2011.

The governance principles setting forth the structure, decision-making process and management of dedicated assets are validated by EDF's Board of Directors. These principles also lay down rules for the asset portfolio's structure, selection of financial managers, and the legal, accounting and tax structure of the funds.

**Strategic asset allocation** is based on asset/liability reviews carried out to define the most appropriate portfolio model for financing nuclear expenses. A benchmark index is also set for performance monitoring and risk control regarding the financial portfolio (excluding RTE and tangible assets). Strategic allocation is reviewed every three years unless circumstances require otherwise. In 2012, assets are allocated as follows: 50% to RTE shares, and the rest to a financial portfolio (half international equities and half bonds).

The financial portfolio contains two sub-portfolios, "equities" and "bonds", themselves divided into "secondary asset classes" that correspond to specific markets. A third sub-portfolio, "cash", is used to prepare and supply the disbursements related to utilisation of provisions for plants currently being decommissioned; this portfolio may be tactically reinforced as a precaution in case of a market crisis.

**Tactical asset management** is organised around four main themes:

- supervision of exposure between the "equities", "bonds" and "cash" sub-portfolios;
- within each sub-portfolio, allocation by "class";
- choice of exposure by geographical area;
- selection of investment funds, aiming for diversification:
  - by style (growth securities, unlisted securities, high-return securities),
  - by capitalisation (major stocks, medium and small stocks),
  - by investment process (macroeconomic and sector-based approach, selection of securities on a "quantitative" basis, etc),
  - by investment vehicle (for compliance with maximum investment ratios);
- for bonds, a choice of securities held directly, through brokers, or via investment funds incorporating the aim for diversification:
  - by type of issue (fixed income, indexed income),
  - by type of instrument (government or supranational bonds, covered bonds and similar, corporate bonds),
  - by issuer and by maturity.

The allocation policy established by the Operational Management Committee<sup>1</sup> was developed on the basis of economic and financial prospects for each market and geographical area, and a review of market appreciation in different markets and market segments.

### Content and performance of EDF's dedicated asset portfolio

At 31 December 2012, the total value of the portfolio was €17,626 million compared to €15,601 million in 2011 (pro forma figures for RTE share valuations following the change in accounting method for actuarial gains and losses on employee benefits).

1. A permanent internal committee for evaluation, consultation and operational decision-making for management of dedicated assets.



## Portfolio content under the classification from Article 4, decree 2007-243 of 23 February 2007

Categories (in millions of Euros)	31 December 2012		31 December 2011	
	Book value <sup>(1)</sup>	Realisable value	Book value	Realisable value
1° Bonds, receivables and other securities issued or guaranteed by an EU member state or OECD country	4,205	4,564	4,168	4,448
2° Bonds, negotiable bills, etc issued by private sector entities	550	642	1,099	1,155
3° Equities, shares and other securities traded on a recognised market, giving access to the capital of companies whose head office is located in the territory of a EU member state or OECD country	60	60	65	65
4° Shares or units in funds investing in assets referred to in 1° to 3°	8,051	8,761	6,541	6,865
5° Shares or units in funds investing principally in assets other than those referred to in 1° to 3°	998	1,191	658	777
6° Real estate shares (shares in unlisted real estate companies)	none	none	none	none
7° Deposits with BNP Paribas Securities Services	0.076	0.076	0.055	0.055
Other payables and receivables (dividends receivable, management fees, currency hedges, etc)	15	15	(19)	(19)
<b>TOTAL FINANCIAL PORTFOLIO</b>	<b>13,879</b>	<b>15,233</b>	<b>12,514</b>	<b>13,291</b>
RTE shares allocated to dedicated assets	2,015	2,393	2,015	2,310
<b>TOTAL DEDICATED ASSETS, EXCLUDING MISCELLANEOUS RECEIVABLES AND PAYABLES</b>	<b>15,879</b>	<b>17,611</b>	<b>14,548</b>	<b>15,620</b>
<b>TOTAL DEDICATED ASSETS</b>	<b>15,893</b>	<b>17,626</b>	<b>14,529</b>	<b>15,601</b>

(1) See EDF SA's financial statements at 31 December 2012, note 19.

## Breakdown by sub-portfolio and performance in 2012

The breakdown of EDF's dedicated asset portfolio at 31 December 2012 and 2011 is as follows:

	31 December 2012	31 December 2011
Equities sub-portfolio	41.6%	37.1%
Bonds sub-portfolio	39.4%	42.4%
Cash sub-portfolio	5.4%	5.7%
RTE shares allocated to dedicated assets	1.6%	14.8%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>

The table below shows the performance by sub-portfolio at 31 December 2012 and at 31 December 2011:

(in millions of Euros)	31/12/2012 Stock market or realisable value	Performance for 2012		31/12/2011 Stock market or realisable value	Performance for 2011	
		Portfolio	Benchmark index <sup>(1)</sup>		Portfolio	Benchmark index <sup>(1)</sup>
Equities sub-portfolio	7,343	+13.8%	+14.4%	5,783	-7.0%	-4.0%
Bonds sub-portfolio	6,937	+10.3%	+10.6%	6,615	+3.9%	+3.4%
<b>TOTAL EQUITIES AND BONDS PORTFOLIO</b>	<b>14,280</b>	<b>+12.0%</b>	<b>+12.6%</b>	<b>12,398</b>	<b>-1.6%</b>	<b>-0.1%</b>
Cash sub-portfolio	953	+1.1%	+0.2%	893	+1.1%	+0.9%
<b>TOTAL FINANCIAL PORTFOLIO</b>	<b>15,233</b>	<b>+11.1%</b>	<b>+12.6%</b>	<b>13,291</b>	<b>-1.6%</b>	<b>-0.1%</b>
RTE shares allocated to dedicated assets	2,393	-	-	2,310	-	-
<b>TOTAL DEDICATED ASSETS</b>	<b>17,626</b>	<b>+10.4 %</b>		<b>15,601</b>	<b>-0.9 %</b>	

(1) Benchmark index: 50% MSCI World DN EUR hedged for the equities sub-portfolio, Citigroup EGBI for the bonds sub-portfolio, Capitalised Eonia for the cash portfolio, 50% MSCI World DN EUR hedged + 50% Citigroup EGBI for the financial portfolio.

At the beginning of 2012 the Euro was in crisis, and this affected bond and equities markets in the Euro zone. When European countries and the Central European Bank showed their determination, including a willingness to provide support for countries in difficulty where necessary (support commitment to Spanish banks and the Greek state; announcement of Outright Monetary Translations by the central bank), the tense Euro zone bond markets saw significant improvements in liquidity and prices. Against this background, the investment policy consisted of regularly reinvesting in equities and bonds over the year. Reinvestment in the bond "class" focused particularly on credit, but also Italian sovereign debt instruments, with investments in certain sovereign debt instruments (Spain, Greece, Ireland, Portugal) remaining negligible. The effect of this approach was partly masked by reclassification of short-term credit instruments nearing maturity, previously included in the bonds sub-portfolio, as a component of the cash sub-portfolio. Reinvestment in the equities sub-portfolio also played a substantial role (this sub-portfolio accounted for 48.2% of the financial portfolio at 31 December 2012, compared to 43.5% in 2011).

In 2012 dedicated assets achieved a performance of +10.4%, with the financial portfolio (excluding RTE) registering +11.1%. The difference compared to the benchmark index performance (+12.6%) is explained by the prudent management approach, reflected in the large cash "class" and the underweighting in equities early in the year, together with a broader diversification of assets than in the benchmark index. Fund selection was also oriented to ensure that the volatility of the equities and bonds sub-portfolios was below the benchmark index volatility. The RTE shares have fulfilled their role as performance stabilisers both in times of market rises (2012) and falls (2011).

Against this background, the overall after-tax performance of dedicated assets (impact on reserves and net income) was +€1,101.4 million: +€948.1 million on the financial portfolio (+1,483.7 million before tax) and +€153.3 million for the RTE shares allocated to dedicated assets).

The distribution of the portfolio between reserved funds and other financial instruments is also presented in note 48 to the consolidated financial statements at 31 December 2012.

EDF is exposed to equity risks, interest rate risks and foreign exchange risks through its dedicated asset portfolio.

The market value of the "equities" sub-portfolio in EDF's dedicated asset portfolio was €7,343 million at 31 December 2012. The volatility of the "equities" sub-portfolio can be estimated on the basis of the volatility of its benchmark index, the MSCI World index, which at 31 December 2012 was 10.2% based on 52 weekly performances, compared to 19.1% at 31 December 2011. Applying this volatility to the value of equity assets at the same date, the Group estimates the annual volatility of the equities portion of dedicated assets at €749 million. This volatility is likely to affect the Group's equity.

At 31 December 2012, the sensitivity of the "bonds" sub-portfolio (€6,937 million) was 5.06, i.e. a uniform 100 base point rise in interest rates would result in a €351 million decline in market value which would be recorded in consolidated equity. While this sensitivity was higher than in 2011 (4.81), it remained well below the sensitivity of the benchmark index (6.43).

## 9.5.1.7 Management of counterparty/credit risk

Counterparty risk is defined as the total loss that the EDF group would sustain on its business and market transactions if a counterparty defaulted and failed to perform its contractual obligations.

The Group has a counterparty risk management policy which applies to the parent company and all operationally controlled subsidiaries. This policy defines the organisation of counterparty risk management and monitoring, and reporting procedures and circuits. It involves monthly consolidation of the exposures on financial and energy markets and half-yearly consolidation for all activities. The policy also includes close supervision of Group counterparties (daily review of alerts, special cautionary measures for certain counterparties).

These supervision procedures proved their robustness during the financial crisis, when the Group moved to a more frequent (quarterly) consolidation of all counterparty risks. In late 2012 a consolidation system was introduced to make the process more reliable and more flexible.

The table below gives details, by rating, of the EDF group's consolidated exposure at the end of September 2012. 83% of the main counterparties for the Group's business qualify as "investment grade", a stable proportion overall compared to the consolidated risk at 30 September 2011.

	AAA	AA	A	BBB	BB	B	CCC/C	Unrated	Total
30/9/2012	7%	23%	39%	14%	2%	1%	1%	13%	100%
30/9/2011	9%	20%	45%	11%	2%	0%	0%	13%	100%

The exposure to counterparty risk by nature of activity is distributed as follows:

	Purchases	Insurance	Distribution and sales	Cash and asset management	Fuel purchases and energy trading	Total
30/9/2012	4%	38%	7%	39%	12%	100%
30/9/2011	4%	34%	7%	40%	15%	100%

Exposure in the energy trading activities is concentrated at EDF Trading. Counterparty risk management for this subsidiary has explicit limits for each counterparty according to its financial robustness. A range of means are used to reduce counterparty risk at EDF Trading, primarily position netting agreements, cash-collateral agreements and establishment of guarantees from banks or affiliates.

Particularly for counterparties dealing with EDF's Trading room, the Financial Risk Control team has drawn up a framework specifying counterparty authorisation procedures and the methodology for calculation of allocated limits (which must correspond to requirements). The level of exposure can be consulted in real time and is systematically monitored on a daily basis. The suitability of limits is reviewed without delay in the event of an alert or unfavourable development concerning a counterparty.

In the context of the Euro zone's financial crisis, EDF continued to apply a prudent management policy for its cash investments (EDF and cash pooling), particularly regarding countries such as Italy and Spain. Transactions are only authorised for "investment grade" Spanish and Italian banking counterparties considered systemic by the Financial Stability Council, meaning they have low risk of default, and the amounts and maturities of such transactions must be limited (no maturities beyond April 2013). EDF holds no direct investment in these countries' sovereign debt.

## 9.5.2 Management and control of energy market risks

### 9.5.2.1 Framework for management and control of energy market risks

In conjunction with the opening of the final customer market, development of the wholesale markets and on the international scene, the EDF group is exposed to price variations on the energy market which can have a significant impact on its financial statements.

Consequently, the Group has an "energy markets" risk policy (for electricity, gas, coal, oil products and CO<sub>2</sub> emission rights) applicable to EDF and entities in which it has operational control.

This policy aims to:

- define the general framework in which the various Group entities carry out their operational activities (energy generation, optimisation and distribution), and their interaction with EDF Trading;

- consolidate the exposure of the various entities controlled by the Group on the structured energy-related markets;
- implement a coordinated hedging policy at Group level.

At Edison, which is now operationally controlled by EDF, the energy market risk policy and associated control process will be introduced as part of Edison's integration into the EDF group. CENG, which was not operationally controlled by EDF at 31 December 2012, partly applies the EDF group's policy for energy market risks.

### 9.5.2.2 Organisation of risk control

The process for controlling energy market risks for entities operationally controlled by the Group is based on:

- a governance and market risk exposure measurement system, clearly separating management and risk control responsibilities;
- an express delegation to each entity, defining hedging strategies and establishing the associated risk limits. This enables the Group's Executive Committee (Comex) to set an annual Group risk profile consistent with the financial objectives, and thus direct operational management of energy market risks within the Group, generally over 3-year market horizon;
- a specific control process, given its close interaction with the decisions made within the generation and supply businesses. This process involves Group management and is based on a risk indicator and measurement system incorporating escalation procedures in the event risk limits are exceeded.

The Group's exposure to energy market risks through operationally controlled entities is reported to the Comex on a monthly basis. The control processes are regularly evaluated and audited.

### 9.5.2.3 Principles for operational management and control of energy market risks

The principles for operational management and control of energy market risks for operationally controlled entities and CENG are based on clearly-defined responsibilities for managing those risks, distinguishing between management of assets (generation and supply) and trading.

Managers of generation and supply assets are responsible for implementing a risk management strategy that minimizes the impact of energy market risks on their financial statements (the accounting classifications of these hedges are described in note 41 to the consolidated financial statements). However, a residual risk remains that cannot be hedged on the market due to factors such as insufficient liquidity or market depth, uncertainty over volumes, etc.

For operationally controlled entities in the Group, positions on the energy markets are taken predominantly by EDF Trading, the Group's trading entity, which operates on the markets on behalf of other group entities and for the purposes of its own trading activity. As such, EDF Trading is subject to a strict governance and control framework in line with current practices in trading companies.

EDF Trading trades on organised or OTC markets in derivatives such as futures, forwards, swaps and options (regardless of the accounting classification applied at Group level). Its exposure on the energy markets is strictly controlled through daily limit monitoring overseen by the subsidiary's management and by the entity in charge of energy market risk control at

Group level. Automatic escalation procedures also exist to inform members of EDF Trading's Board of Directors of any breach of risk limits (value at risk limit) or loss limits (stop-loss limits). Value At Risk (VaR) is a statistical measure of the company's potential maximum loss in market value on a portfolio in the event of unfavourable market movements, over a given time horizon and with a given confidence interval. EDF Trading assesses VaR by the Monte Carlo method, which refers to historical volatilities and correlations estimated on the basis of market prices observed over the 40 previous trading days. The stop-loss limit stipulates the acceptable risk for the trading business by setting a maximum level of loss over a rolling three-month period. If the limit is exceeded, EDF Trading's Board of Directors takes appropriate action, which may include closing certain positions.

In 2012, EDF Trading's commitment on the markets was subject to a daily VaR limit of €45 million<sup>1</sup> (with a daily confidence interval of 97.5%), and a stop-loss limit of €225 million<sup>2</sup>. VaR fluctuated between €2.6 million and €19.1 million over the year.

The table below shows the VaR and stop-loss limits for 2012 and 2011:

(in millions of Euros)	H2 2012	H1 2012	H2 2011	H1 2011
VaR limit (97.5% 1-day)	45	45	45	45
Stop-loss limit	225	225	225	225
Minimum VaR	2.6	5.9	4.3	4.7
Average VaR	7.1	10.1	6.9	10.4
Maximum VaR	11.4	19.1	10.4	18.7

The VaR and stop-loss limits were not exceeded in 2012, even when market volatility was high in February, and EDF Trading's risks remained within the limits of the mandate from EDF at all times. The stop-loss has never been triggered since its introduction.

At Edison, the governance model<sup>3</sup> separates risk management and control from operational trading activities. For operational purposes, Edison calculates its net exposure<sup>4</sup> based on its entire portfolio of assets and contracts (industrial portfolio), other than those related to trading for the company's own purposes (trading portfolio).

The level of economic capital engaged in the markets, expressed in terms of Profit at Risk (PaR)<sup>5</sup>, is then determined using this net exposure.

To meet obligations under IFRS 7, Edison measures the maximum potential decrease in the fair value of financial contracts hedging the risks on its industrial portfolio using a PaR with a confidence interval of 97.5%. For trading activities, which concern a separate portfolio distinct from the industrial portfolio, Edison sets a daily limit of 95% VaR. Like the industrial portfolio, Edison's trading portfolio was allocated an amount of economic capital<sup>6</sup>. This allocation takes account of the risks related to the portfolio's VaR and the risks estimated through stress tests on any non-liquid structured positions<sup>7</sup>.

For an analysis of the fair value of the Group's commodity hedging derivatives, see notes 41.4.3 and 41.5 to the consolidated financial statements for the year ended 31 December 2012. For details of commodity contracts not classified as hedges by the Group, see note 42.3 to the same consolidated financial statements.

### 9.5.3 Management of insurable risks

The EDF group has an extensive insurance programme that covers EDF SA and controlled subsidiaries as they are integrated, including ERDF and RTE. The coverage, exclusions, excesses and limits are appropriate to each business and the subsidiaries' specificities.

The main insurance programmes cover:

- **conventional damage to Group property:** EDF is a member of OIL<sup>8</sup>. Additional insurance coverage is provided by EDF's captive insurance subsidiary Wagram Insurance Company Ltd<sup>9</sup>, other insurers and reinsurers: RTE has taken out a conventional damages insurance programme specific to its own property (substations, buildings and technical premises);

1. The VaR takes into account diversification of risks between the activities of EDF Trading and the activities of EDF Trading North America. This limit does not take into account the diversification associated with the joint venture Chubu, whose VaR limit of €2 million is added to EDF Trading's VaR limit of €43 million.

2. Five times the VaR, i.e. €225 million.

3. This model is being brought into line with the EDF group's policy.

4. Net exposure is the residual exposure after using all natural hedging options provided by vertical and horizontal integration of the various techniques.

5. Profit at Risk or PaR is a statistical measure of the maximum potential decline, related to unfavourable market movements, in the margin compared to budget for a given time horizon and confidence interval.

6. Economic capital is the capital allocated to deal with market risks.

7. Figures are available in Edison's 2012 annual Report, chapter Group financial risk management.

8. Oil Insurance Limited Mutual Insurance Company.

9. An Irish insurance company fully-owned by EDF.

- **damage to merchandise transported;**

- **damage to the EDF group's nuclear facilities:** in addition to coverage through EDF's membership of OIL, physical damage (including following a nuclear accident) to EDF's nuclear installations in France and EDF Energy's nuclear facilities in the United Kingdom, and nuclear decontamination costs are covered by a Group insurance policy involving the French nuclear pool (Assuratome), the British atomic pool National Risk Insurers (NRI) and the European Mutual Association for Nuclear Insurance (EMANI). In connection with CENG's operations in the United States, EDF Inc is a member of NEIL (Nuclear Electric Insurance Limited);

- **nuclear operator's civil liability:** EDF's current insurance policies comply with French law n° 68-943 of 31 October 1968, as amended by law n° 90-488 of 16 June 1990, which codified the civil liability obligations imposed on nuclear facility operators by the Paris Convention. To guarantee availability of the funds required to meet such obligations, EDF opted to use insurance policies. The cover provided by EDF's policies with Allianz and the European Liability Insurance for the Nuclear Industry (ELINI) is equal to the limits of liability set by law in the event of an accident, whether at a nuclear facility or during transport.

For onsite accidents, total cover is €91.5 million per nuclear accident, for a maximum of two occasions per site within a three-year period. In accordance with the law, these insurance policies purchased do not include an excess amount. However, Océane Re, a Group reinsurance company, shares this risk through reinsurance agreements entered into with Allianz and ELINI.

EDF Energy operates nuclear plants in the United Kingdom, where the liability scheme applicable to operators of nuclear facilities is similar to that in France. EDF Energy is insured with Nuclear Risk Insurers Limited (NRI), the British nuclear insurance pool, to the extent of £140 million, the current limit for civil liability applicable to nuclear plant operators in the United Kingdom.

- **general civil liability:** this programme covers the Group against the possible financial consequences for third parties of the (non-nuclear) risks inherent to the EDF group's businesses;
- **civil liability of directors and senior executives:** EDF's insurance programme covers the Group's directors and chief executive officers;
- **construction risks:** for these risks, EDF takes out insurance policies covering specific worksite risks (general worksite risks/general assembly risks). These policies are not part of a Group programme but are purchased on an ad hoc basis for major projects such as the Flamanville EPR, or construction of combined cycle power plants, dams, combustion turbines, etc. This cover, amounting to €11 million, is recorded as an investment in the EDF SA financial statements;
- on 11 August 2011 ERDF took out a policy with Natixis/Swiss-Re for **coverage of ERDF's aerial distribution network** against the consequences of exceptional events such as storms and gales. This "cat-bond" provides maximum cover of €150 million, with payouts based on a parametric index dependent on wind speed. On 27 December 2011, additional €40 million coverage was subscribed for a four-year period, to reduce the excess. The arrangements for setting up damage insurance for the Island Energy Systems' aerial distribution networks are still under examination.

The total value of premiums for all types of coverage provided by EDF's insurance programmes and Group programmes managed by EDF Assurances was €111 million in 2012, of which €62 million was borne by EDF (excluding investments) and €18 million was for coverage of ERDF's overhead networks.





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# 10 Cash flows and capital

For information pertaining to capital and cash flows, see section 9.4 (“Cash Flows and financial debt”) in this reference document.

For information on to the issuer's financing structure, see section 9.5.1.1 (“Liquidity position and management of liquidity risk”) in this reference document.





# 11 Research and development, patents and licenses

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The main goals of the EDF group's Research and Development (R&D) Division are to contribute to the improvement in the performance of the operational units, to identify and prepare mid and long-term growth vectors and to anticipate the major challenges facing the Group in the global energy context. Aspects of this context include, in particular:

- fossil resources, which are being depleted, and global warming, which implies questioning and regulations on the rate of greenhouse gas emissions;
- water uses, management of the environment, etc.;
- the rapid development of emerging countries, which is shifting consumption areas;
- the significant development of information technologies in the energy environment, which is offering new opportunities in electricity generation; and
- customers, who are consumers and are also becoming producers. They want to consume better and live in buildings, neighbourhoods or towns that are more energy self-sufficient.

In this context, R&D has a crucial role in finding solutions to all of these challenges. Its research focuses on three main priorities:

- to consolidate a "carbon-free" energy mix thanks to actions designed to further improve the safety and performance of the current nuclear fleet,

its operating life and the development of new reactors that integrate feedback from the Fukushima accident, to increase the operational safety and performance of Hydropower stations operated by EDF and to fine-tune tools and methods designed to support the development of renewable energy;

- to develop flexible low-carbon energy demand thanks to better knowledge of demand, increased customer energy efficiency, the promotion of new, efficient uses for electricity often associated with renewable energy (heat pumps, electrical mobility, etc.), the development of technical and economic modelling to be used to engineer buildings, industry and sustainable cities, and the further integration of uses and consumption into the electricity network via smart grids and tariffs;
- to adapt the electricity network via the improvement of network asset management, optimisation models and economic scenarios for new transmission infrastructure projects, the integration of intermittent energy and the development of smart grids.

This approach is part of the "3x20<sup>1</sup>" commitment by 2020, defined by the European Union through its Strategic Energy Technology Plan which gives a road map of the developments and uses of key technologies concerning, in particular, solar energy, carbon capture and storage, energy efficiency and sustainable cities. To achieve this goal, it depends on public-private partnerships in which EDF actively participates to share the risks.

## 11.1 R&D organisation and key figures

EDF's R&D is integrated and multidisciplinary in order to facilitate synergies and transfers of processes between business lines and between companies of the Group.

In 2012, EDF's total research and development budget was €523 million. It is one of the highest R&D budgets among the largest electricity players. About 70% of the budget is allocated to programs developed annually with the EDF operational departments and subsidiaries. The remaining 30% is dedicated to medium and long-term anticipatory programs which are in line with the priorities of the Group's R&D.

In 2012, around 20% of this budget was dedicated to environmental protection. These expenses specifically cover research on energy efficiency, the uses of electricity as a substitution for fossil energy, renewable energy and its integration within the electricity network, sustainable cities, the local impacts of global warming and other environmental issues such as biodiversity, water quality or reduction of pollution.

EDF's R&D has more than 2,000 employees, of which 80% are managers and approximately 150 are PhD candidates. There are 200 researchers teaching in universities and major graduate schools. Each year, it hires about 100 people and regularly places personnel in other entities within the EDF group. The R&D Division has 15 departments. Its expertise covers all Group activities: renewable energy; networks; nuclear power, thermal and Hydropower generation; energy management; commerce; Information Systems; and the environment. They represent disciplines, businesses, projects and are integrated over major systems. The development of skills and staff is managed over a rolling three-year period.

EDF's R&D manages an internal training organisation, the Institute of Technology Transfer (ITech), whose role is to share the practices, know-how and innovations resulting from EDF's R&D with the EDF group as a whole. The catalogue of about a hundred training courses is updated each year

and, starting this year, has been incorporated into the Skills Academies (see section 17.1.2 ("Training and mobility policy")).

R&D is currently organised around seven sites: three are located in the Greater Paris area, one in Germany, one in the United Kingdom, one in Poland and one in China. The Chatou and Renardières centres near Fontainebleau have around 500 people each. The Clamart centre has nearly 1,000 people.

In November 2010, EDF's Board of Directors approved the plan to establish EDF's main R&D centre, currently in Clamart, on the campus at Paris-Saclay. The building permit has been obtained and is free of third-party claims. This centre is intended to accommodate up to 1,500 people, including Group researchers and doctoral candidates. EDF thus gives new ambition to its R&D and puts innovation and scientific and industrial research at the heart of its priorities. This positions EDF as a leading player on the Paris-Saclay campus and will allow it to profit from a dynamic and enhanced cooperation with higher education institutions and public and private research centres established nearby. In 2012, several partnerships were formalised through contracts with institutions located at the Paris-Saclay site:

- a joint research laboratory between EDF and Telecom Paris Tech has been launched on the Internet of devices and cybersecurity (SEIDO) for electricity networks. Its challenge is to prepare for and facilitate the rollout of energy efficiency and energy demand management services based on communicating, interoperable energy devices (heating, air conditioning, white and brown goods, electric vehicles, etc.), and thus help ensure the cohesion of the entire system, as well as its safety (security, confidentiality, etc.);
- the joint Rise Grid laboratory with Supelec on smart grid modelling and simulation;
- the SEISM institute for earthquake modelling from fault to structure, comprising EDF, CEA, Ecole Centrale Paris, ENS Cachan and CNRS.

1. 20% reduction in greenhouse gas emissions, 20% increase in energy efficiency and a 20% portion of renewable energy in energy consumption by 2020.



The Gaspard Monge Program for Optimization and Operations Research, in conjunction with the Jacques Hadamard Mathematical Foundation, was also inaugurated in 2012 at the *École Polytechnique*. It was made possible by sponsorship from EDF's R&D Division.

The R&D sites house two combined CNRS research units – the Mechanical Laboratory of Industrial Sustainable Structures and the Research and Development Institute on Photovoltaic Energy – and two international R&D centres – the Materials Aging Institute and the European Centre Laboratories for Energy Efficiency Research.

In Germany, the European Institute for Energy Research ("EIFER"), a joint institute created in 2002 between EDF and the University of Karlsruhe, brings together more than 100 people. Since 2010, three new R&D units have been created: a joint team with EDF Polska in Krakow (Poland), a joint centre with EDF Energy in London and a centre in Beijing linked to EDF's Asia-Pacific Division, inaugurated in June 2011. Its aim is to be in contact with the major energy partners in China when this country develops and modernises its infrastructures, in terms of both production and grids.

In the United States, energy is an important R&D field, particularly in the areas of the environment, and the independence and security of supply. Its development is supported by American legislation. In electricity, the Electric Power Research Institute ("EPRI") is one of the key R&D partners. It supplies technologies and economic and strategic analyses to its members which represent more than 90% of the electricity generated in the United States and bring together around 40 countries. For several years, a team of R&D researchers has been sent to the United States and works in close collaboration with the EPRI and EDF Inc. The partnership with the EPRI covers multiple domains such as nuclear energy, renewable energy, smart grids, energy efficiency, and CO<sub>2</sub> capture and storage.

In order to achieve its goals, EDF continues to invest in powerful and reliable digital simulation equipment. It develops calculation codes and leading calculation methods.

Furthermore, the Group has unique experimental resources like specific analytical loops (chemistry-corrosion, rupture, aero-acoustics, etc.), loops centred on components or processes, on-site trials of response resources, or resources means dedicated to the characterisation of materials and their aging. EDF has also decided to invest in new testing facilities:

- a new laboratory dedicated to low-energy buildings. As buildings account for two-thirds of electricity consumption, EDF endeavours to optimise their energy efficiency. In 2012, EDF commissioned a laboratory dedicated to thermal insulation and to the testing of building envelopes;

- a new lighting laboratory: with the emergence of high-output LED, a breakthrough lighting technology, EDF would like to have reliable technical data on innovative products so that it can provide its customers with the best possible advice. Commissioned in 2012, EDF R&D's new lighting laboratory will enable it to validate technology choices, verify energy efficiency data and propose regulatory-compliant solutions;
- Concept Grid: Concept Grid is a small-scale electricity network whose purpose is to test the integration of the innovative equipment and "smart" systems that make up a smart grid before installing them on the network. Concept Grid seeks to prepare for changes in the distribution network, by studying the integration of new components and equipment derived from information and communication technologies and facilitating demand management. It also aims to facilitate the integration of decentralised generation by studying how generation methods affect the electricity network and by conducting research into electricity storage applications. The "Concept Grid" platform will be operational in 2013.

EDF and RTE, under the CRE's supervision and pursuant to the provisions of the Third Energy Package, have agreed to modify the contractual arrangements for the studies and testing conducted by EDF's R&D for RTE. As a result of this change, EDF's R&D will acquire the laboratories owned by RTE at the Renardières site.

R&D also reinforces its ability to industrialise and promote internal innovation and develop an opening for external innovation. It aims to integrate the innovations in the industrial processes of the Group. The approach is organised around two actions:

- to better use internal innovation and to accelerate the "time to business" through actions in collaboration with the business lines to expedite and promote the industrialisation phase. Thus, a dedicated team helps to protect and use EDF R&D's intellectual property and expertise potential and to accelerate the transfer and industrialisation of innovations;
- to develop an opening on external innovations, and, as needed, demonstrate external innovations.

EDF is the lead investor in Electranova Capital, a venture capital fund for start-ups specialising in clean technology launched in May 2012, with support from Allianz and in partnership with Idinvest Partners. The Electranova Capital fund has a minimum investment capacity of €60 million and the mission of promoting the emergence of innovative projects in new technologies to meet the challenge of a low-carbon energy model. In 2012, Electranova Capital made its first two investments, in Actility, a French company specialising in "smart grids", and in the Norwegian company Seatower, which has developed an innovative gravity-based foundation solution for offshore wind farms.

## 11.2 R&D priorities

EDF's R&D works for all the businesses of the Group. It provides technological solutions or innovative and economic business models that improve the performance of the businesses and prepares the long-term future of the Group through medium and long-term anticipatory programs. It contributes to making EDF a worldwide industrial group of carbon-free electricity networks.

The ambition of EDF's R&D in the context of profound energy changes falls within three categories: consolidate and develop a carbon-free energy mix, promote flexible low-carbon energy demand and adapt the electricity network to these new challenges.

### 11.2.1 Consolidate and develop a carbon-free energy mix

In nuclear power generation, Hydropower and fossil-fuel fired power, EDF's R&D develops tools and methods to improve the safety of generation methods, to optimise their operating life and to increase their generation and environmental performance. Three major goals are priorities: to perpetuate the Group's nuclear power advantage, develop renewable energy sources, and study the industrial feasibility of carbon capture and storage.

In order to reinforce and perpetuate the Group's nuclear power advantage, R&D works to protect EDF's assets by incorporating its actions into the safety improvement process for the facilities, with the aim of enhancing their generation and environmental performance and extending their operating life. Actions in this area also deal with difficulties linked to the fuel cycle and lead to assessments of the design of new power plants, in particular fourth-generation plants and small modular reactors (SMRs). Lastly, R&D's actions help EDF understand and manage the impact of the facilities on the environment and in parallel to take account of environmental risks on industrial tools. R&D therefore studies the outlook for the availability of water resources linked to climate change and changing regions. R&D's work thus offers insight into the possible risks and consequences for the generation fleet (availability of the cooling source, modulation capacity, placement optimisation).

The questions posed by the above topics require a sound understanding of the phenomena in play. In support of these programmes, R&D thus develops digital simulation tools and experimental test methods, as well as the tools capable of managing the new challenges faced by the growth in mass of digital data, computer security and new information and communication technologies.

The events at Fukushima in 2011 have led to intensified research on safety, the environment (external attacks) and lifespan, as well as to interest in new fields such as the rehabilitation of an inhabited area that is evacuated after a nuclear accident. In 2012, EDF's R&D contributed to the Additional Safety Assessments by conducting detailed studies, in particular on the following topics: the onsite radiological environment in the event of emissions, structures' earthquake resistance margins, and the attack levels (floods and weather events) used to design important safety equipment.

In 2012, EDF's R&D, in conjunction with other European nuclear power players, also spearheaded NUGENIA, an international non-profit association formed in March 2012 whose objective is to become the single framework for R&D cooperation in Europe for Generation II and III nuclear plants within the European Sustainable Nuclear Energy Technology Platform (SNETP). The association has 60 members from 18 countries. EDF chairs the organisation, which will facilitate the creation of synergies and joint projects between members and/or with national R&D programmes in the following areas: safety and risk analysis, severe accidents, core and reactor operation, component integrity and aging, fuel, waste and decommissioning, and innovative Generation III design, and also the cross-functional challenges relating to the harmonisation of practices (mainly in the area of safety) and inspections/non-destructive testing.

EDF also provided the impetus for the launch in 2012 of the "Connexion" project relating to future digital nuclear instrumentation and control systems, as part of the French government's Investment in the Future programme<sup>1</sup>. This project brings together industrial partners and academics in the French nuclear industry to work on an ambitious research programme to develop future methods for designing, qualifying and upgrading power plants' digital instrumentation and control facilities. This initiative also meets the challenge of harmonising industrial solutions within the sector.

The second priority is support for the development of renewable energies. These play a growing role in the European energy landscape and EDF, an already significant participant, wants to continue to grow its positions in this domain.

R&D's objective for renewable energy is to identify technological breakthroughs with significant competitive implications and contribute to the development of the most promising technologies, in partnership with the academic and industrial world. EDF is studying a number of renewable energies: Hydropower, photovoltaic, onshore and offshore wind, solar thermal, biomass, marine energy, geothermal, etc.

R&D also works on the development of performance for EDF, a developer and operator of electricity generation systems based on renewable energies integrated within electricity networks, intended to:

- reduce investment risks - for instance, R&D is developing tools to forecast producible wind-power and photovoltaic generation. R&D's work in 2012 has, in particular, reduced the uncertainties in forecasting producible photovoltaic power plant generation in order to improve the accuracy of future plants' business plans;
- improve the operating performance – for example, R&D has developed a tool to forecast the remaining life of a vital component of the wind turbine, the gearbox. This forecasting tool helps to optimise maintenance (by scheduling maintenance during periods of low wind);
- manage the technical and economic impact on the electricity network and ensure a balance in the electricity network while integrating renewable energy. The works deal with the definition of integration methods for renewable energies in the electricity network. This assumes the analysis of various solutions to allow the integration of intermittent renewable energy and an assessment of the limits and costs of integration in large networks: storage, super grids, smart grids, demand management, etc.

The third priority is carbon capture and storage and limiting the CO<sub>2</sub> emissions of thermal power plants. Cost, the impact on the facility's yield and the deadlines for implementing such processes are all important issues.

For the existing power plants, the capture of CO<sub>2</sub> by processing exhaust gases now appears to be the best solution. With the support of the ADEME and its partners, EDF is installing a CO<sub>2</sub> capture research test unit on the EDF carbon electricity generation power plant in Le Havre. The technology, tested on the CO<sub>2</sub> present in the exhaust gases coming from carbon combustion, is known as "post combustion amine capture". The purpose of this research test unit is to verify the performance of this technology in an industrial environment and analyse its flexibility in operation. This test unit is an indispensable step in the development of more efficient industrial energy solutions. EDF's R&D is also investigating new ways to prepare for the emergence of a second generation of CO<sub>2</sub> capture and storage technologies, with a lower energy penalty (see section 6.2.1.1.5 ("Fossil-fuel fired generation")).

## 11.2.2 Promote flexible low-carbon energy demand

The development of energy efficiency and distributed renewable energy, regulatory and technological changes, as well as the opening up to competition, give customers the possibility of being participants in their energy consumption or production. To meet these expectations, EDF:

- proposes efficient energy solutions within the new regulatory framework;
- modernises its customer relationship through new information technologies;

1. "Investment in the Future" is a loan issued by the French State to fund innovative research activities relevant to the economic development of France.

- develops new tariff approaches encouraging dynamic management of demand to meet new requirements in terms of the flexibility of the electricity network (upstream-downstream optimisation and intermittent nature of renewable energies);
- tests downstream smart grids and prepares for the development of new uses, such as electric vehicles and “smart grid-ready” equipment in buildings;
- develops a service offer for sustainable cities and territories.

In this context, R&D is positioned on several priority areas. First, the integration of new information technologies in the networks and in the home, offering the customers the option of participating more fully in the system and thus allowing them to manage their energy flows locally. Thus, the first step is to prove knowledge of customers and their demands in order to make innovations in the methods and tools of the customer relationship as well as in supply offers. These works are specifically carried out via smart grid test units, in which R&D examines new models surrounding the aggregation of different types of flexible demand (interruptibility, shift in consumption, own consumption, renewable energies, energy planning and management on the local scale). To enable residential customers to determine how much electricity they are consuming between two bills, EDF has designed and developed a module for smartphones and computers that allows the customers to estimate their bill by taking into account factors such as their seasonal electricity consumption and past consumption.

Developing low-carbon demand also involves the design and approval of reference energy solutions. So the second component is innovation on new uses for electricity, for electrical mobility, the heat pump and on more economical buildings.

Finally, to achieve sustainable development, cities are locally optimising infrastructures and their management (transportation, waste treatment, buildings, energy generation and networks) and are aiming to become smart or “sustainable” cities. EDF is therefore investing in a partnership with the city of Singapore to develop a city planning decision support project. This project is based on the modelling of complex systems, taking into account the interactions between the different urban systems, and enabling the optimisation of strategic choices, for example, regarding the use of solar energy on the roofs of buildings, the analysis of waste collection, and the optimisation of the energy demand of buildings. This modelling is combined with innovative tools for 3D visualisation, at the building and neighbourhood level, of the impacts of the planning choices, for example, on greenhouse gas emissions. The Singapore experience will be a showcase for the project.

Electrical mobility is an important aspect of the sustainable city: electrical transportation is one possibility for profound transformation in transportation methods. Battery storage is the key technology in electrical transportation. R&D action in this area consists firstly of characterising battery security and performance in the laboratory and secondly, of innovating in terms of breakthrough technology that may highly improve their autonomy or cost reductions. R&D also considers stationary applications of these battery technologies (coupling with renewable energy, system services, etc.)

The other essential theme of electrical mobility is the issue of infrastructures and recharge strategies adapted to this new method of consumption. R&D develops charge strategies and tests their validity in the field. R&D thus takes part in operating the KLEBER test unit in Strasbourg (85 rechargeable hybrid vehicles, 130 charging terminals located at home, at car parks, by the roadside, etc.) and is preparing to participate in other test unit projects in France. Studies to integrate mobility in territorial coherency plans and in local urban planning are also being conducted in France (Nice and Mulhouse) and in Germany (Karlsruhe).

## 11.2.3 Adapt the electricity network to these new challenges

The transition toward a carbon-free energy economy in Europe implies meeting new challenges: how to better manage the intermittent nature of renewable energy generation sources; how to integrate new uses of electricity by optimising the means of production and network needs; how to develop the systems to manage energy locally; and on a larger scale, where to develop the network infrastructures and how to optimise electricity flows in Europe. More generally, the question is how to optimise, in the pursuit of the public interest and with due regard for electricity's competitiveness, the economic balance of the electricity network (generation investments, investments in grids and the costs and benefits of energy and environmental efficiency solutions), with no significant increase in the customer's bills and no added complexity, while also maintaining the quality and reliability of the electricity network.

The evolution toward smarter electricity networks, known as “smart grids”, is one of the pivotal points of the transition to a carbon-free energy economy in Europe. The major challenges are technical, economic and regulatory and are related, beyond the integration of renewable energy and new uses, to the management of information for the different network users and the need to control costs.

In order to meet these challenges, R&D has set several priorities. First, to anticipate the arrival of new technologies and changes in the energy landscape, it establishes forward-looking scenarios, modelling and optimising energy savings (global macro-economic environment and energy policies, competitive and regulatory environment). In order to anticipate the consequences of the development of new generation resources or new uses, it is developing models of the energy system that provide better management of the balance between supply and demand. To obtain an objective assessment of the costs and benefits of the different options, it implements and proposes harmonised methods of analysis to the different stakeholders.

The second priority is to help the integration of decentralised intermittent generation by contributing innovative solutions to resolve operating and connection problems (maintaining the voltage, etc.). EDF's R&D thus contributes to the development of new functionalities for grid management and operations and of new solutions for new communicating meters, such as ERDF's Linky project. For example, R&D has developed and tested a new functionality for managing the distribution network when generation is decentralised. With this innovative method of management, it is possible, using an estimate of the condition of the network, to keep the voltage on the HVA network within the contractual range even in the case of decentralised generation.

R&D is also testing electricity use management systems based on the Linky infrastructure. This testing has, in particular, shown the feasibility of load interruptibility, such as electric heating, to reduce peak consumption periods.

It is developing new models and methods of sharing information, based on international standards, and has had a major success in smart grids. The specification of the G3 power line communication (PLC) protocol developed by EDF's R&D for ERDF was approved as the international standard in 2011 by the ITU, the United Nations specialised agency for information and communication technologies. This recognition is a very important milestone in the rollout of smart meters. G3 PLC paves the way for the development of a consistent set of open standards for smart metering infrastructure and for numerous smart grid applications. With laboratory testing now completed, G3 PLC technology is now in the field phase, and nearly 2,000 G3 Linky meters are being rolled out in Lyon and Tours.

The third priority is to improve the management of network assets (aging, automation and metering solutions). This work implements the laboratory tests on modelling material aging. R&D is also working to expand grid automation to optimise quality and costs.

Finally, the work includes electricity networks and super grids. The insertion of renewable energy may profoundly change the technical-economic fundamentals and contribute to the development of large continuous direct current grids in Europe and elsewhere in the world.

To find solutions to these new challenges, a cooperative approach is being taken to developing a number of smart electrical test units in France and

Europe. R&D is closely involved (NiceGrid, Smart Electric Lyon, Millener, Premio, Venteea, Une Bretagne d'avance, etc.), with the aim of shedding light on the issues associated with the transition of the electricity network, learning technical and economic, but also social and environmental lessons, while also considering business models and regulation. These projects also provide an opportunity for discussion and innovation with the electricity sectors and new information and communication technologies (NICT) to best adapt the equipment to the flexibility requirements of the electricity network of the future. Numerous tests are therefore under way to explore the full potential of communicating metering, the first link in the smart electricity network chain.

## 11.3 International and partnerships

To conduct its research and development programs, EDF's R&D develops numerous partnerships in the world. These partnerships aim to maintain its expertise at the highest level, worldwide, in the disciplines at the heart of EDF's challenges and to complete our internal areas of expertise. The partnership policy of R&D takes various forms both nationally and internationally.

Several years ago, in France, R&D set up 12 joint laboratories with academic partners and technical or industrial centres and participates with them in collaborative research projects financed by national agencies like the National Research Agency, the ADEME or the *Fonds Unique Interministeriel* through competitiveness zones. Each joint laboratory is an opportunity to create a joint team around a shared scientific and technical problem, in order to create value, expertise and knowledge for all the partners, and constitutes an asset for participating in cooperative projects. R&D also supports four targeted research and teaching chairs, within the framework of the Foundation for the Energy of Tomorrow.

R&D has also submitted nominations for projects of institutes of excellence in low-carbon energy (IEED) under Investment in the Future. In March 2012, the French government announced the winners of this call for projects. EDF is involved in four of them:

- the Institut Photovoltaïque Île-de-France (IPVF): this institute, of which EDF is one of the founding members, targets technological breakthroughs to make photovoltaic energy competitive in the market. The Institute will ultimately bring together 180 researchers from different partners at a state-of-the-art facility in Saclay;
- France Énergies Marines, for marine energy and offshore wind;
- SuperGrid, dedicated to major transmission networks to connect remote renewable energy generation sites and;
- Vedecom, for electrical mobility.

Also of note is EDF's involvement in two projects that were not selected for IEED but for which funds have been set aside in light of the strategic nature of the activity. These projects are PS2E, which addresses the energy efficiency of industrial processes, and Efficacy, which concerns the energy efficiency of cities.

EDF also provided the impetus for the launch in 2012 of the "Connexion" project relating to future digital nuclear instrumentation and control systems, as part of the French government's Investment in the Future programme (see section 11.2.1 ("Consolidate and develop a carbon-free energy mix")). In Europe, R&D is participating in about thirty projects and has established a relationship with the Joint Research Center, a European Union energy and transport research centre whose objective is to collaborate on low-carbon technologies and on electricity storage in particular. Through collaboration with the Energy Technology Institute, the Engineering and Physical Sciences Research Council and with various British universities, it is expanding its presence in the British research partnership.

Since 2010, three new R&D units have been created, one in Poland, one in the United Kingdom and another in China.

The British centre consolidates the positions of the Group in the ecosystem of British research. It is particularly involved in tidal wind energy and nuclear power in the United Kingdom. In 2012, this research centre was transformed into an independent legal entity: EDF Energy R&D UK Centre Ltd. This subsidiary is part of EDF Energy. Its new status increases EDF's visibility and the research capabilities in Great Britain in keeping with the Group's development strategy.

The research team within EDF Polska is dedicated to carbon thermal questions and biomass co-combustion. The Krakow R&D centre, for example, conducts laboratory tests of different types of biomass and coal blends to determine the optimal ratio of biomass to coal in terms of quality, safety, process reliability and performance.

The centre based in Beijing is an advantage so as to participate in large-scale Chinese test units focusing on smart grids, smart cities, and some renewable energy technologies. This centre is also being used to support the implementation of the nuclear contract in China. The creation of the centre is accompanied by development focusing on academic and industrial partnerships in China. For example, EDF has signed a joint research programme in China on solar thermal power. The cooperation with the Institute of Electrical Engineering of the Chinese Academy of Sciences mainly concerns research and innovation work carried out on a testing platform dedicated to solar thermal power technologies located in Badaling. One of EDF's challenges is to develop its modelling capabilities by using the measurements taken during tests conducted on this platform.

In the United States, the R&D and innovation sector is one of the largest and most dynamic in the world. This sector has some 1.3 million researchers. For several years, EDF has had R&D and Innovation teams established at the premises of the Electric Power Research Institute ("EPRI")<sup>1</sup>. Its objectives are to optimise the collaboration between EDF and EPRI in many areas, such as nuclear energy, renewable energy, smart grids, energy efficiency, and carbon capture and storage, to set up partnerships between the EDF group and American research bodies (universities, national laboratories,

industry, etc.) selected for their know-how or their facilities, and finally to assess the opportunities of new models of activity for EDF in the United States. Furthermore, to pave the way for the future, R&D participates in two Knowledge and Innovation Communities ("KIC"<sup>2</sup>). The specific fields covered by the first, called "KIC Climate" are climate change, smart cities, water management and carbon-free generation. Those of the second, called "KIC InnoEnergy" are based on smart grids and storage, bio-fuels, renewable energy, CO<sub>2</sub> capture and storage, and nuclear power.

## 11.4 Intellectual property policy

Industrial property plays a major role in protecting the EDF group's technologies and know-how against competition, as well as in the capitalisation of these assets through licensing.

EDF wants to strengthen its intellectual property portfolio intended to make the most of its capacities for innovation and its technological expertise. This portfolio is made up of patents, trademarked software and formalised know-how.

### Patents

At the end of 2012, EDF's portfolio included 483 patented inventions protected by 1,531 intellectual property titles in France and abroad.

Strengthening of the patent portfolio is a top priority. It is intended to facilitate R&D cooperation, to provide protection in the development of EDF's activities, to contribute to the external image of EDF, to reinforce researchers' motivation and to focus fully on inventions.

In 2012, EDF lodged 53 patent applications, compared with 50 in 2011.

### Trademarks

"EDF" is a trademark registered in more than 80 countries. The name of the Group is an essential element of its image and its assets: thus, this brand name, the Internet domain names and the EDF logos are monitored constantly, in order to protect them against any fraudulent use which could hurt the Group's image. Then, following the results of the analysis made regarding the value of EDF trademark, the Company has set up intra-group royalty trademark licenses with its affiliates using EDF trademark.

The Group has also registered various other trademarks, in particular, those related to the business of its various subsidiaries.

The trademark portfolio of the EDF group at the end of 2012 included some 400 names protected by nearly 1,300 intellectual property titles.

1. The Electric Power Research Institute is one of the key R&D players in the field of electricity in the United States. This non-profit body provides technologies and economic analyses and develops strategies for its funding members, which in the United States represent more than 90% of the electricity generated in the United States.

2. The KIC are European initiatives to set up European university training and research/innovation projects responding to the needs of the market both in skills and innovation through the filing of patents and the creation of start-ups.





Photo credit © EDF – Alexandre Sargos

# 12 Information on trends

## 12.1 Subsequent events

### Contribution to the Public Electricity Service (CSPE)

EDF announced on 14 January 2013 that an agreement have been reached with the French government, in which the Group would be compensated for the accumulated shortfall in the Contribution to the Public Electricity Service (CSPE). Under this agreement, the French government will recover the debt and expenses that it caused the Group (management costs and costs of bearing the shortfall). This debt should be settled by 31 December 2018, according to a repayment schedule established with the public authorities, and will be repaid at market rates. This transaction will generate non-recurring financial income of around €600 million for EDF for financial year 2012.

By a letter dated 8 February 2013, the Group obtained the authorisation to allocate the entire CSPE ("Contribution au Service Public de l'Électricité") receivable to the dedicated assets, which will be used in securing financing for long-term nuclear expenses. In compliance with regulations, this was delivered by the French Ministry of Finance and the Economy as well as the French Ministry of Ecology, Sustainable Development and Energy. Dedicated assets are a reserve fund set up by the Group to cover its long-term nuclear commitments, in accordance with conditions set by law.

### EDF raises over €6 billion with its first hybrid issues

On 24 January, EDF successfully launched a hybrid issue for US\$3 billion, which will take its place alongside issues already made in euros and pounds sterling. These issues will enable the Group to raise a total of around €6.2 billion in the three currencies, making it the largest corporate hybrid issue ever made:

- US\$3 billion with annual coupon of 5.25% and 10-year first call date;
- €1.25 billion with annual coupon of 4.25% and 7-year first call date;
- €1.25 billion with annual coupon of 5.375% and 12-year first call date;
- £1.25 billion with annual coupon of 6 % and 13-year first call date.

These issues have received considerable interest from institutional investors and have been oversubscribed several times. This high level of demand has come from the US, Asia, the UK and Continental Europe, thus enabling the Group to diversify its investor base geographically.

### Centrica will forfeit its option in the Hinkley Point C project

On 4 February, Centrica announced that it would forfeit its 20% option in the project to construct 2 EPRs at the Hinkley Point site. The EDF Group reviewed this decision and understands that the profile for this investment does not correspond to the priorities and expectations of Centrica's shareholders. EDF is continuing discussions with the British government to establish a sale price for the low-carbon electricity that will make the new nuclear plants competitive. Once this price is established, the Group is confident that enough interest in the Hinkley Point EPR project will be expressed by partner investors to enable its completion.

### Signing of a definitive agreement with TOTAL group relative to the acquisition of TIGF

On 4 April 2013, the Consortium constituted by Snam, the Italian gas transport and storage operator (45%), GIC, the Singaporean sovereign fund (35%), and EDF (20%, through its dedicated assets for the dismantling of nuclear plants), has entered into a definitive agreement with the Total group for the acquisition of its gas transport and storage business in the South-West of France – TIGF (Transport et Infrastructures Gaz France). On February 5, 2013, the Consortium and Total had entered into exclusive negotiations in respect of this potential acquisition. Closing of the transaction remains subject to approvals by relevant regulatory and antitrust authorities.

## 12.2 Changes in electricity prices in France in January and February 2013

The price of crude oil was globally stable from January-February 2012 (to \$114.1 per barrel on average, down -1%). Impact of high tensions between Europe and Iran, which drove prices to this level in 2012 has today decreased as more optimistic economic perspectives lead for 2013 to an increased demand forecast, which put the prices up.

Gas prices rose at the end of January due to the fall in temperatures over the short term and the use of long-term storage sites. Prices averaged £67.7/therm, up 4.5% compared with the first two months of 2012.

CO<sub>2</sub> prices are down and amount to €5.0/ton, in relation to uncertainties regarding a possible decision of the EU to regulate the excess of quota supply. They are down 40% compared to the beginning of 2012.

Coal prices stayed feeble in the first two months of the year, averaging \$99.8/t, down by 13% from the first months of 2012. On the short term

equilibrium between supply and demand was relaxed due mainly to American and Columbian coal imports and low demand from power producers, which maintains a downward pressure on forward prices.

In the first two months of 2013, spot prices for baseload power traded at an average of €52.5/MWh in France (down €9.0/MWh compared to the same period in 2012), €43.9/MWh in Germany (down €3.3/MWh), and €58.8/MWh in England (up €4.9/MWh).

French consumption of electricity decline compared to the first two months of 2012 due to particularly low temperatures in the first half of February 2012. Therefore prices are down. In Germany decrease in prices is lower, the country being less thermosensitive than France. In England increase in gas prices drove prices of electricity up.



Photo credit © EDF – Philippe Eranian

# 13 Financial outlook

The beginning of 2013 was characterised by uncertain economic conditions in Europe, moderate inflation and US dollar and pound sterling volatility against the euro, economic policies marked by increased emphasis on controlling public spending, expectations of a gradual tightening of monetary policies, and lastly by steady commodity prices.

In this context, electricity demand should experience moderate growth and wholesale prices should rise slightly in France and the UK. Activity should be fairly stable in the other international markets.

The expected growth in business, in conjunction with the continuation of the Group Synergies and Transformation programme and the Spark cost reduction programme, which will result in a 5% drop in external purchases by the Group starting in 2013, for an amount of around €1 billion, will enable the Group to set the following financial objectives in 2013:

- organic growth target<sup>1</sup> for EBITDA excluding Edison of between 0% and 3%;
- Edison: recurrent EBITDA outlook in line with 2012, with a projected volatility in results between 2013 and 2014 due to the gas supply contract renegotiation timetable.

The EDF Group is continuing its efforts in 2013 to handle a certain number of key challenges for the Group's financial equation and will present by the end of the year a detailed review of its medium-term financial trajectory.

In France, for 2013, EDF is hoping to achieve a nuclear output target of between 410 and 415 TWh. Similarly, in the UK, the Group would like to repeat its 2012 performance with nuclear generation. At the same time, the Group believes it will be able to make a decision whether or not to invest in the Nuclear New Build on the Hinkley Point site in the UK. This net investment

program should stay below €12 billion in 2013, at constant scope and exchange rates and excluding strategic transactions. It essentially covers the generation fleet in France and the industrial maintenance required in order to sustain its level of performance in the long-term, as well as investments to maintain and renew distribution. The other components of this programme are the investments to develop new production capacities that generate EBITDA and operating cash flows once the capacities are commissioned.

The Group also set the following objectives in 2013:

- a dividend distribution rate of between 55% and 65% of net income excluding non-recurring items;
- a net indebtedness/EBITDA ratio of between 2x and 2.5x;
- maintenance at its best level for its business segment of a rating adapted to its profile and goals, as part of a cautious management of its assets and liabilities.

These objectives are based on data, assumptions and estimates believed to be reasonable. They may, however, change or be modified due to uncertainties related in particular to the economic, financial, competitive, regulatory or climatic environment. In addition, the realisation of certain risks described in chapter 4 ("Risk factors") of this reference document would have an impact on the Group's activities and its ability to achieve its objectives.

The achievement of the objectives also assumes the successful implementation of the strategy presented in section 6.1 ("Strategy") of this reference document. Thus, EDF makes no commitment or guarantee as to the achievement of the objectives and the forward-looking information in this chapter may not be used to establish forecasts of results.

(1) Growth at constant scope and exchange rates and excluding non-recurring events.







# 14 Administrative, management and supervisory bodies and Executive Management

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## 14.1 Board of Directors

### 14.1.1 Members of the Board of Directors

In accordance with article 6 of French law n° 83-675 of 26 July 1983 relating to the democratisation of the public sector, the Company's Board of Directors consists of eighteen members, one third of whom are elected by the employees and two thirds are appointed by the Shareholders' Meeting on recommendation from the Board of Directors, with the exception of the representatives of the French State who are appointed by decree.

The Board of Directors consists of 6 Directors appointed by the Shareholders' Meeting, 6 Directors representing the French State and 6 Directors elected by employees.

In the course of the 2012 fiscal year, Mr. François Loos, Chairman of the French Environment and Energy Management Agency (ADEME – *Agence de l'environnement et de la maîtrise de l'énergie*), was appointed Director representing the French State by decree of 13 February 2012, replacing Mr. Philippe Van de Maele.

Mrs. Marie-Christine Lepetit, Head of the Inspectorate General of Finance, was appointed Director representing the French State by decree of 7 May 2012, replacing Mr. Pierre-Marie Abadie.

Mr. Pierre-Marie Abadie, Energy Manager at the General Directorate for Energy and Climate (DGEC – *Direction générale de l'énergie et du climat*), reporting to the Minister for Ecology, Sustainable Development and Energy since July 2008, was appointed Government Commissioner to EDF, by order of 15 June 2012.

Finally, David Azéma, Commissioner for French State holdings, reporting to the Minister for the Economy and Finance and the Minister for Industry, was appointed Director representing the French State, by decree of 9 November 2012, replacing Mr. Jean-Dominique Comolli.

The table below shows, on the 15 March 2013, the names of the members of the Board, their dates of birth, principal positions held within or outside the Company, as well as the offices held and expired outside the Company over the past five years.

### Directors appointed by the Shareholders' Meeting

Name, date of birth, office or position held within the Company	Current offices / Principal position held outside the Company	Expired offices held outside the Company over the past five years
<b>Henri PROGLIO</b> Born June 29, 1949  Chairman and Chief Executive Officer since 25 November 2009  Director since 23 November 2004 <sup>(1)</sup>  Last re-elected: 23 November 2009  Term expires: 22 November 2014  Chairman of the Strategy Committee	Chairman of the Board of Directors of Edison Chairman of the Board of Directors of EDF Energy Holdings Chairman of the Board of Directors of the EDF Foundation Chairman of the Board of Directors of the Electra Association Director of EDF Énergies Nouvelles Director of EDF International (SAS)  Director of South Stream Transport BV (Netherlands) Director of South Stream Transport AG (Switzerland) Director of CNP Assurances Director of Dassault Aviation Director of Fomento di Construcciones y Contratas – FCC (Spain) Director of Natixis  Deputy Chairman of the Strategic Nuclear Energy Committee Member of the Atomic Energy Committee Member of the High Committee for Transparency and Information on Nuclear Safety Director of the <i>Fondation européenne pour les énergies de demain</i> (European Foundation for Tomorrow's Energies) Member of the National Committee on Sectors of Vital Importance	Chairman of the Board of Directors of Transalpina di Energia Chairman of the Board of Directors of EDF Energy UK Director of EDF International (SA)  Chairman of the Board of Directors of Veolia Transport Chairman of the Board of Directors of Veolia Environnement Chairman of the Board of Directors of Veolia Propreté Chairman and Chief Executive of Veolia Environnement Chairman of the Supervisory Board of Eolfi Chairman of the Supervisory Board of Dalkia France Chairman of the Board of Directors of Veolia Water  Chairman of the Supervisory Board of Veolia Eau Director of Veolia Environnement Director of Veolia Propreté Director of Veolia Environnement North America Operations Member of the Supervisory Boards A and B of Dalkia Director of Veolia Environmental Services UK Director of Veolia Transport Australasia Director of Veolia Environmental Services Australia Director of Veolia Environmental Services North America Director of SARP Industries Director of Veolia Transport Northern Europe Director of Dalkia International Director of Siram Director of Société des Eaux de Marseille Manager of Veolia Eau  Member of the Supervisory Board of Lagardère Non-voting member ( <i>censeur</i> ) of the Supervisory Board of Caisse Nationale des Caisses d'Épargne Director of Casino Guichard Perrachon

(1) Henri Proglío had been Director of the French State-owned industrial and commercial institution (*établissement public industriel et commercial - EPIC*) EDF since 14 September 2004.

Name, date of birth, office or position held within the Company	Current offices / Principal position held outside the Company	Expired offices held outside the Company over the past five years
<b>Philippe CROUZET</b> Born 18 October 1956  Director since 23 November 2009  Term expires: 22 November 2014  Chairman of the Nuclear Commitments Monitoring Committee	<b>Principal position held outside the Company:</b> Chairman of the Management Board of Vallourec  <b>Other offices and positions held:</b>  <i>In France:</i> Chairman of Vallourec & Mannesmann Tubes  <i>Abroad:</i> Director of V & M do Brasil (Brazil)	Chairman and member of the Supervisory Board of V & M France Director of VMOG France Director of Finalourec Member of the Supervisory Board of Vallourec Chairman of Saint-Gobain Distribution Bâtiment Chairman of the Supervisory Board of Point P Chairman of the Supervisory Board of Lapeyre Chairman of Aquamondo Chairman of Partidis Chairman of Projeo Chairman of Saint-Gobain Distribution Chairman of Saint-Gobain Distribution Nordic Chairman of the Board of Directors of Dahl International Member of the Supervisory Board of Raab Karcher Baustoffe Director of Saint-Gobain Cristaleria Director of Norandex Distribution Director of Saint-Gobain Building Distribution Director of Jewson Director of Meyer Overseas Investment
<b>Mireille FAUGÈRE</b> Born 12 August 1956  Director since 23 November 2009  Term expires: 22 November 2014  Chair of the Ethics Committee	<b>Principal position held outside the Company:</b> General Manager of Assistance Publique - Hôpitaux de Paris  <b>Other offices and positions held:</b> Director of Essilor International Director of Fondation L'Oréal Deputy Chair of the Board of HEC	Chairman of SNCF-Voyages Développement Chairman of Voyages-SNCF.com General Manager of Voyage SNCF Director of SNCF Participations
<b>Michael JAY</b> Born 19 June 1946  Director since 23 November 2009  Term expires: 22 November 2014  Member of the Strategy Committee and the Nominations and Compensation Committee	<b>Principal position held outside the Company:</b> Crossbench member of the British House of Lords Chairman of the Nominations Committee of the British House of Lords Member of the Foreign Affairs, Defence and Development Sub-Committee of the House of Lords' European Union Committee  <b>Other offices and positions held:</b> Director of Associated British Foods Director of Candover Investments Director of Valeo Chairman of Merlin (international medical NGO)	Director of Crédit Agricole SA

# 14 | Administrative, management and supervisory bodies and Executive Management

## Board of Directors

Name, date of birth, office or position held within the Company	Current offices / Principal position held outside the Company	Expired offices held outside the Company over the past five years
<b>Bruno LAFONT</b> Born 8 June 1956  Director since 20 May 2008  Last re-elected: 23 November 2009  Term expires: 22 November 2014  Chairman of the Nominations and Compensation Committee	<b>Principal position held outside the Company:</b> Chairman and Chief Executive Officer of Lafarge  <b>Other offices and positions held:</b>  <i>In France:</i> Member of HEC Advisory Board  <i>Abroad:</i> Director of ArcelorMittal (Luxembourg) Director of Lafarge Shui On Cement (China) Advisor to the Mayor of the City of Chongqing (China)	Chairman of the Entreprises pour l'Environnement association Director of Lafarge India
<b>Pierre MARIANI</b> Born 6 April 1956  Director since 23 November 2009  Term expires: 22 November 2014  Chairman of the Audit Committee	<b>Principal position held outside the Company:</b> Chairman of the Board of Directors of Dexia Asset Management Managing Director and Chief Executive Officer of Pierre Mariani Consulting  <b>Other offices and positions held:</b> Director of the <i>Fonds hellénique de stabilité financière</i> Director of the <i>Etablissement Public de la Réunion des Musées Nationaux et du Grand Palais</i>	Executive Director and Chairman of the Executive Committee of Dexia Chairman of the Board of Directors of DenizBank Director of Dexia Crédit Local Director of Dexia Banque International in Luxembourg Director of Dexia Banque Belgique

## Directors representing the French State

Name, date of birth, offices or positions held within the Company	Current offices / Principal position held outside the Company	Expired offices held outside the Company over the past five years
<p><b>David AZEMA</b> Born 22 November 1960</p> <p>Director since 9 November 2012</p> <p>Term expires: 22 November 2014</p> <p>Member of the Audit Committee, Strategy Committee and the Nominations and Compensation Committee</p>	<p><b>Principal position held outside the Company:</b> Commissioner for State holdings reporting to the Minister for the Economy and Finance and the Minister for Industry</p> <p><b>Other offices and positions held:</b> Director of Air France-KLM Director of the <i>Fonds Stratégique d'Investissement</i> (French Strategic Investment Fund) Director of Renault Member of the Supervisory Board of Areva Member of the Scientific Committee of La Fabrique de la Cité</p>	<p>Chairman and Chief Executive Officer of Kéolis Chairman and Chief Executive Officer of SNCF Participations Chairman and Chief Executive Officer of Cofiroute Holding Chairman and Chief Executive Officer of SOC 11</p> <p>Chairman of the Management Board of Kéolis group Chairman (SAS) of SNCF Participations Chairman (SAS) of Vinci Concessions Russie Chairman (SAS) of Vinci Infrastructures Chairman (SAS) of Vinci Services Aéroportuaires Chairman (SAS) of Vinci Airports</p> <p>Chief Executive Officer of Vinci Concessions Senior Executive Vice President of the SNCF group</p> <p>Chairman of the Supervisory Board of Seafrance Chairman of the Board of Directors of Vinci Airports US</p> <p>Director of Arcour Director of Cambodia Airport Management Services Director of Compagnie Financière &amp; Industrielle des Autoroutes Director of Gefyra Director of Geodis Director of Société Concessionnaire de l'Aéroport Director of Union Nationale des Services Publics Industriels Director of Vinci Concessions Director of Vinci Concessions Canada Director of Vinci Park</p> <p>Representative of the Chairman of Vinci Concessions to: Truck Etape Holding Park Azur Pirandello Ingénierie VEN 1</p> <p>Representative of the non-Executive Director of Vinci Airports to: Vinci Airports Holding</p> <p>Permanent representative of the Director of Vinci to: Société des Autoroutes Esterel Côte d'Azur Provence</p> <p>Permanent representative of the Director of Vinci Concessions to: Cofiroute Consortium Stade de France Autoroute du Sud de la France ASF Holding</p> <p>Permanent representative of the Director of Société Nouvelle de l'Est de Lyon to: Soc 16</p>
<p><b>Julien DUBERTRET</b> Born 9 June 1966</p> <p>Director since 21 June 2011</p> <p>Term expires: 22 November 2014</p>	<p><b>Principal position held outside the Company:</b> Budget Director at the Minister for the Economy and Finance, responsible for budget matters</p> <p><b>Other offices and positions held:</b> Director of SNCF</p>	<p>None</p>



# 14 | Administrative, management and supervisory bodies and Executive Management

## Board of Directors

Name, date of birth, offices or positions held within the Company	Current offices / Principal position held outside the Company	Expired offices held outside the Company over the past five years
<b>Yannick d'ESCATHA</b> Born 18 March 1948  Director since 23 November 2004  Last re-elected: 23 November 2009  Term expires: 22 November 2014  Member of the Audit Committee and the Nuclear Commitments Monitoring Committee	<b>Principal position held outside the Company:</b> Chairman of the <i>Centre National d'Etudes Spatiales</i> (CNES – French national space agency)  <b>Other offices and positions held:</b> Chairman of the Board of Directors of the Université de Technologie in Troyes Permanent CNES representative to the Board of Directors of Arianespace SA Permanent CNES representative to the Board of Directors of Arianespace Participation Director of Thales Member of the Academy of Technologies	Chairman of the Board of Directors of Ecole Polytechnique  Director of RATP
<b>Marie-Christine LEPETIT</b> Born 27 August 1961  Director since 7 May 2012  Term expires: 22 November 2014  Member of the Nuclear Commitments Monitoring Committee, Strategy Committee and Ethics Committee	<b>Principal position held outside the Company:</b> Head of the Inspectorate General of Finance at the Ministry for the Economy and Finance  <b>Other offices and positions held:</b> None	None
<b>François LOOS</b> Born 24 December 1953  Director since 13 February 2012  Term expires: 22 November 2014	<b>Principal position held outside the Company:</b> Deputy Director of the regional Council for Alsace  <b>Other offices and positions held:</b> Chairman of the Supervisory Board of Euler Hermes Director of Atesys Director of Caisse du Crédit Mutuel de Zinsel du Nord Director of GSE Director of Alsace Amorceage Director of Alsace Création Director of Invest in France Agency Director of Oseo Région	Chairman and Chief Executive Officer of the French Environment and Energy Management Agency (ADEME) Director of the French Development Agency
<b>Pierre SELLAL</b> Born 13 February 1952  Director since 1 April 2009 Last re-elected: 23 November 2009 Term expires: 22 November 2014 Member of the Strategy Committee	<b>Principal position held outside the Company:</b> Ambassador of France, General Secretary of the Ministry for Foreign Affairs  <b>Other offices and positions held:</b> Member of the Supervisory Board of Areva Member of the Atomic Energy Committee Member of the High Council of the Institut du Monde Arabe Director of the <i>Ecole Nationale d'Administration</i> (French National School of Administration) Director of <i>Audiovisuel Extérieur de la France</i> (French international audiovisual holding company) Director of the Institut Français Director of the Board of Directors of the <i>Agence nationale des titres sécurisés</i> (French national secure identity document agency) Member of the Board of Directors of the Commission for the Verification of the Registration of Works of Art ( <i>Commission de récolement des dépôts d'œuvres d'art</i> ) Member of the Board of Directors of the French national health emergency preparation and response body ( <i>Établissement de préparation et de réponse aux urgences sanitaires</i> )	Permanent representative of France to the European Union in Brussels

## Directors elected by employees

Name, date of birth, offices or positions held within the Company	Current offices / Principal position held outside the Company	Expired offices held outside the Company over the past five years
<b>Christine CHABAUTY</b> Born 19 July 1971  Commercial Attaché, Key Accounts, EDF Trade Division  Director since 23 November 2009  Term expires: 22 November 2014  Member of the Ethics Committee	Member of an elected industrial tribunal ( <i>conseiller prud'homal</i> )	None
<b>Alexandre GRILLAT</b> Born 8 December 1971  Representative of the Manager of ERDF in the Alsace - Franche-Comté region  Director since 23 November 2004 <sup>(1)</sup>  Last re-elected: 23 November 2009  Term expires: 22 November 2014  Member of the Audit Committee, Strategy Committee and Ethics Committee	None	None
<b>Philippe MAÏSSA</b> Born 21 November 1949  Engineer at the EDF Centre for Thermal Engineering (Centre d'Ingénierie Thermique)  Director since 23 November 2009  Term expires: 22 November 2014  Member of the Ethics Committee	None	None
<b>Marie-Hélène MEYLING</b> Born 30 October 1960  Attaché to the EDF Upstream/Downstream Optimisation  Director since 1st September 2011  Term expires: 22 November 2014  Member of the Audit Committee, Nuclear Commitments Monitoring Committee, Strategy Committee and Ethics Committee	None	None
<b>Jean-Paul RIGNAC</b> Born 13 May 1962  Research engineer at the EDF Research & Development Division  Director since 7 November 2007  Last re-elected: 23 November 2009  Term expires: 22 November 2014  Member of the Strategy Committee	None	None
<b>Maxime VILLOTA</b> Born 25 November 1959  Purchasing Policy Coordinator for the Finance and Industrial Relations Department at the Tricastin nuclear power plant  Director since 13 December 2006  Last re-elected: 23 November 2009  Term expires: 22 November 2014  Member of the Audit Committee and the Nuclear Commitments Monitoring Committee	None	None

(1) Alexandre Grillat had been Director of the French State-owned industrial and commercial institution (*établissement public industriel et commercial - EPIC*) EDF since 14 September 2004.

## 14.1.2 Personal information on members of the Board of Directors

### Directors appointed by the Shareholders' Meeting

**Henri Proglio.** Born on 29 June 1949 in Antibes (France), Henri Proglio is a graduate of the École des Hautes Etudes Commerciales (HEC). He joined Compagnie Générale des Eaux in 1972 and was appointed Chairman and Chief Executive Officer of Compagnie Générale d'Entreprises Automobiles (CGEA) in 1990. In 1999, he was appointed Vice President of Vivendi, Manager of Compagnie Générale des Eaux and Chief Executive Officer of Vivendi Water. He became Chairman of the Management Board of Veolia Environnement in 2000, then Chairman and Chief Executive Officer from 2003 to November 2009. Henri Proglio has been Chairman and Chief Executive Officer of EDF since 25 November 2009. He was appointed Director of EDF in September 2004. Within the EDF group, he is Chairman of the Boards of Directors of Edison and EDF Energy Holdings. He is a Director of EDF Énergies Nouvelles and EDF International (SAS). He is also Chairman of the Boards of Directors of the EDF Foundation and the Electra association. In addition, he is Director of CNP Assurances, Dassault Aviation, Fomento de Construcciones y Contratas, Natixis, South Stream Transport BV (Netherlands) and South Stream Transport AG (Switzerland). He is deputy Chairman of the Strategic Nuclear Energy Committee, member of the French Atomic Energy Committee, the High Committee for Transparency and Information on Nuclear Safety and Director of the *Fondation européenne pour les énergies de demain*. He is member of the French National Committee on Sectors of Vital Importance.

**Philippe Crouzet.** Born on 18 October 1956 in Neuilly-sur-Seine (France), Philippe Crouzet is a graduate of the Institut d'Études Politiques (IEP – Institute of Political Studies) in Paris and a former student of the École Nationale d'Administration (ENA – National School of Administration). From 1981 until 1986, he was auditor and then Counsel (*Maître des Requêtes*) at the French Council of State (*Conseil d'Etat*). He joined the Saint-Gobain Group in 1986 as Head of Corporate Planning. Within this Group, he served successively as Chief Executive Officer of Papeteries de Condat (1989-1992), General Manager for Spain and Portugal (1992-1996), Head of the Building Glazing Division (1996), Head of the Ceramics and Plastics Division (1996-2000), Vice President for Finance, Information Systems and Purchasing (2000-2005) and then Group Vice President and Chief Executive Officer for the Building Distribution Division (2005-2009). Since April 2009, Philippe Crouzet has been Chairman of the Management Board of Vallourec. He has been a Director of EDF since November 2009.

**Mireille Faugère.** Born on 12 August 1956 in Tulle (France), Mireille Faugère is a graduate of the École des Hautes Études Commerciales (HEC). She began her career at SNCF in 1979, where she first held a range of railway operational positions before joining the Research Department (*Direction des études*). In 1987, she was entrusted with the mission of developing the TGV Méditerranée railway network. In 1991, she was appointed Manager of the Montparnasse railway station in Paris. In 1993, Mireille Faugère was appointed manager of the Strategy Department at the Economy, Strategy and Investment Division. From 1996 until 2001, she served as head of the sales and marketing department at the Mainline Division. From 2001 until 2003, she was Chief Executive Officer of SNCF Participations and Head of the Mergers & Acquisitions Department of the Finance Division. From 2003 until 2010, she was a member of the Executive Committee of SNCF and Chief Executive Officer of the SNCF Voyages branch. In September 2010, Mireille Faugère was appointed Chief Executive Officer of Assistance Publique – Hôpitaux de Paris. She has also been a Director of Essilor International since May 2010 and deputy chair of the Board of HEC since June 2011 and she has also been a Director of Fondation L'Oréal since May 2012. She has been a Director of EDF since November 2009.

**Michael Jay.** Born on 19 June 1946 in Shawford (United Kingdom), Michael Jay is a graduate of the University of Oxford (Magdalen College) and the School of Oriental and African Studies at the University of London (SOAS). Following a career with the Foreign Office (British Ministry of Foreign Affairs), he served as British Ambassador in Paris from 1996 to 2001, Permanent

Under-Secretary at the Foreign Office and Head of the Diplomatic Service from 2002 to 2006. He was the British Prime Minister's representative at the G8 in 2005 and 2006. He has been a Crossbench Member of the House of Lords since 2006. He was appointed Chairman of the House of Lords Appointments Commission in 2008. He is a member of the Foreign Affairs, Defence and Development Sub-Committee of the House of Lords' European Union Committee. He has been a Director of Associated British Foods since 2006, Valeo since 2007 and Candover Investments since 2008. He is Chairman of Merlin, an international medical NGO. He has been a Director of EDF since November 2009.

**Bruno Lafont.** Born on 8 June 1956 in Boulogne-Billancourt (France), Bruno Lafont is a graduate of the École des Hautes Etudes Commerciales (HEC) and a former student of the École Nationale d'Administration (ENA). He began his career with the Lafarge Group in 1983, serving in several positions in the Corporate Finance Division and internationally. In 1995, he became Group Vice President Finance and joined the Executive Committee. In 1998, he became Chairman of the plaster business. In May 2003 he was appointed Group Deputy Chief Executive Officer and then Director on 25 May 2005. Appointed Chief Executive Officer in January 2006, he became Chairman and Chief Executive Officer of Lafarge in May 2007. He has also been a Director of ArcelorMittal since 2011. He has been a Director of EDF since May 2008.

**Pierre Mariani.** Born on 6 April 1956 in Rabat (Morocco), Pierre Mariani is a graduate of the École des Hautes Études Commerciales (HEC) and a former student of the École Nationale d'Administration (ENA), as well as a graduate in law. From 1982 until 1986, he was Financial Inspector at the Ministry for the Economy and Finance's Inspectorate General of Finance. From 1986 until 1988, he was responsible for the transportation sector at the Budget Office of the Ministry for the Economy and Finance and then, from 1988 until 1992, Head of the Department for Synthesis and Budget Policy at the Ministry for the Economy and Finance. From 1992 to 1993, he was Deputy Manager of the labour, employment, health and social security department at the Ministry for the Economy and Finance. From 1993 until 1995, he was Private Secretary to Nicolas Sarkozy, then the Budget Minister, and Government spokesman, head of communication. From 1995 until 1996, he was Chief Executive Officer of Société Française d'Investissements Immobiliers et de Gestion (SEFIMEG). From 1996 to 1997, he was Chief Executive Officer and member of the Management Board of Banque pour l'Expansion Industrielle (Banexi). He was Chairman of this Management Board from 1997 to 1999. From 1999 to 2003, he was Manager of the International Retail Banking Department of the BNP Paribas Group. From 2003 to 2008, he was Manager of the International Retail Banking and Financial Services Department. Early in 2008, he was appointed Deputy Chief Executive Officer and Deputy Manager of Retail Banking, in charge of the International Retail Banking Services Department of BNP Paribas. In October 2008, he was appointed Executive Director and Chairman of the Management Committee of Dexia. He is currently Chairman of the Board of Directors of Dexia Asset Management and Managing Director and Chief Executive Officer of Pierre Mariani Consulting. He is a Director of the Etablissement Public de la Réunion des Musées Nationaux et du Grand Palais since 2011 and of the *Fonds hellénique de stabilité financière* since February 2013. He is a Director of EDF since November 2009.

### Directors appointed by the French State

**David Azéma.** Born on 22 November 1960 in Neuilly-sur-Seine (France), David Azéma is a graduate in law, graduate from the Institut d'Études Politiques (IEP – Institute of Political Studies) in Paris and a former student of the École Nationale d'Administration (ENA – National School of Administration). He began his career in 1987 as auditor at the French National Audit Office, then public auditor. From 1991 to 1993, he was Senior Auditor to the Executive Management of the French National Police Force then served in different positions at the office of the Minister for Labour, Employment and Vocational Training, Martine Aubry. In 1993, he joined SNCF, where he worked as senior auditor for the Strategy Division,

then became advisor to the Chairman and SNCF Group Subsidiaries and Shareholdings Manager. In 1998, he served in the United Kingdom as Chairman of the InterCapital and Regional Rail Consortium then Chairman and Chief Executive Officer of Eurostar Group, a joint subsidiary of SNCF, SNCB and Eurostar UK. In October 2002, he joined the Vinci Group as Chief Executive Officer of Vinci Concessions then the Executive Board of the Vinci Group in 2006. In June 2008, David Azéma returned to SNCF as Senior Executive Vice President, Strategy & Finance before being appointed Senior Executive Vice President of the SNCF Group in October 2011. In June 2012, he was appointed Chairman of the Management Board of the Kéolis group, a subsidiary of SNCF specialised in public transport of passengers in France, Europe and worldwide. Since 1 September 2012, he has been Commissioner to State holdings, reporting to the Minister for the Economy and Finance and the Minister for Industry. He is a member of the Board of Directors of Air France-KLM, the Fonds Stratégique d'Investissement, Renault and member of the Supervisory Board of Areva. He has been a Director of EDF since 9 November 2012.

**Julien Dubertret.** Born on 9 June 1966 in Paris (France), Julien Dubertret is a graduate of the Institut d'Études Politiques in Paris and a former student of the École Nationale d'Administration (ENA). He began his career in 1992 as a civil administrator, at the Budget Directorate, and then continued, from 1996 to 1998, at the European Bank for Reconstruction and Development (EBRD) as an Associate Banker. Since 1999, he has held several positions within the Budget Directorate, and particularly as Assistant Director of budget synthesis and public finance (*sous-Directeur de la synthèse budgétaire et des finances publiques*) from 2003 to 2007. From May 2007 to May 2011, he was advisor to the office of the Prime Minister, François Fillon, firstly in charge of the budget and then the budget, public sector and state reform. Since 1 May 2011, he has been Budget Director reporting to the Minister for Economy and Finance, in charge of the budget matters. He has been a Director of SNCF since 24 May 2011 and EDF since 21 June 2011.

**Yannick d'Escatha.** Born on 18 March 1948 in Paris (France), Yannick d'Escatha is a former student of the École Polytechnique and a Corps des Mines engineer. He is a teacher-researcher at the École Polytechnique, École Nationale Supérieure des Mines de Paris and École Nationale Supérieure des Techniques Avancées, a specialist researcher in ground, structural and fracture mechanics and was appointed in 1978 as head of the department for the supervision of nuclear construction where he was in charge of the technical inspection of the French nuclear power program by the French State. In 1982, he was seconded to Technicatome, a subsidiary of the Atomic Energy Committee (CEA), specialising in nuclear engineering and specifically in nuclear naval propulsion, where he became Senior-Executive Vice President in 1987. He was appointed Director of the CEA Advanced Technology Division in 1990, then Deputy General Director in 1992 and General Director in 1995. In 1999, he was appointed Chairman of CEA Industrie. He was appointed Senior Executive Vice President of EDF in 2000. In 2003, he was appointed Chairman of the Centre National d'Études Spatiales (CNES - French National Space Agency). He is also Chairman of the Board of Directors of the Université de Technologies in Troyes and a member of the Académie des Technologies. He is a permanent representative of CNES on the Board of Directors of Arianespace SA and Arianespace Participation and a Director of Thalès. He has been a Director of EDF since November 2004.

**Marie-Christine Lepetit.** Born on 27 August 1961 in Morlaix (France), Marie-Christine Lepetit is a former student of the École Polytechnique and a former student of the École Nationale d'Administration (ENA). In 1987, she joined the Inspectorate General of Finance, where she held auditing and advisory positions. Then in 1991, she was recruited by Jean Lemierre to the Directorate General for Tax in order to introduce management control. She was in charge of synthesis work at the tax law department in January 1995 before joining the office of the Prime Minister, Alain Juppé, as technical advisor in tax matters and macroeconomic studies then taxation and SMEs from 1995 to 1997. She continued her career at the General Directorate for Tax, working to improve service quality (pre-filled tax returns, remote procedures, certification). She was appointed Director of Tax Law at the Ministry for the Economy and Finance in January 2004 and used this role to push through tax reforms from 2004 to 2012. At the same time, she co-chaired the working group on reform of the financing of social welfare in 2006 and co-signed the report by the conference of experts on the "energy-climate contribution" chaired by Michel Rocard. She also sat on the Local

Authorities Reform Committee chaired by Edouard Balladur as Executive Director and was a member of the Public Life Renewal and Ethics Committee chaired by Lionel Jospin. She has been Head of the Inspectorate General of Finance at the Ministry for the Economy and Finance since 12 March 2012. She has been a Director of EDF since 7 May 2012.

**François Loos.** Born on 24 December 1953 in Strasbourg (France), François Loos is a former student of the École Polytechnique and a Corps des Mines engineer. He began his career as an engineer for several companies, in both France and Germany. From 1984, he worked as technical advisor to the President of the European Parliament, Pierre Pflimlin, and to the Minister for Research and Technology, Hubert Curien, from 1984 to 1985. In 1985, he joined Rhône Poulenc to manage the Thann plant from 1986 to 1987, and then he was in charge of the general secretariat of the group's scientific division from 1987 to 1989. He then became Chief Executive Officer of the Lohr Group from 1990 to 1993. François Loos became involved in local political life from 1992. He was elected regional councillor for Alsace from 1992 to 2010, then member of the French parliament for the Bas-Rhin département from 1993 to 2011. After the AZF disaster, he chaired the investigatory committee on industrial risks in France in 2001. In 2002, he was appointed Minister delegate for Higher Education and Research, then Minister delegate for External Trade and finally Minister delegate for Industry from 2005 to 2007. From December 2011 to January 2013, François Loos was Chairman and Chief Executive Officer of the French Environment and Energy Management Agency (ADEME). He has been a Director of EDF since 13 February 2012.

**Pierre Sellal.** Born on 13 February 1952 in Mulhouse (France), Pierre Sellal is a graduate of the Faculty of Law and Economic Sciences in Strasbourg and a former student of the École Nationale d'Administration (ENA). He began his career with the Ministry for Foreign Affairs at the Directorate of the United Nations from 1977 to 1980, then became technical advisor to the Office of the Minister for External Trade (1980-1981). Adviser to the Permanent Representative of France to the European Communities in Brussels from 1981 to 1984, he then served as Head of International Relations at the Ministry of Industrial Redeployment and External Trade (Oil Directorate) until 1985. At that time, he was appointed by the Prime Minister as Deputy Secretary General of the Inter-Ministerial Committee (SGCI) for issues of European economic cooperation, a position he held until 1990. A member of the working group entrusted with developing a future outlook for all the consequences of introducing the European single market from 1988 to 1990, he became Minister-Counsellor at the French Embassy in Rome in 1990, then Minister-Counsellor, Deputy Permanent Representative of France to the European Union in Brussels from 1992 to 1997. In 1997, he was appointed Director of European Cooperation at the Ministry for Foreign Affairs before being appointed Private Secretary to the Minister for Foreign Affairs from 1997 to 2002. As Ambassador and Permanent Representative of France to the European Union in Brussels from 2002 to 2009, he was named Ambassador of France in November 2008. Pierre Sellal has been the Secretary General of the Ministry for Foreign and European Affairs since 14 April 2009. He is a member of the Atomic Energy Committee and the Supervisory Board of Areva. Pierre Sellal is also Director of Audiovisuel Extérieur de la France (AEF), École Nationale d'Administration and the Institut du Monde Arabe. He has been a Director of EDF since April 2009.

## Directors elected by employees

**Christine Chabauty.** Born on 19 July 1971 in Maisons-Laffitte (France), Christine Chabauty is a graduate in law. She gained professional experience in a legal environment and in 2000 joined EDF's Trading Department as commercial attaché to the Key Accounts department. She now works for the Key Accounts Division's Marketing and Trading Department. Since December 2008, she has also served as a member of an elected industrial tribunal (*conseiller prud'hommal*). Sponsored by the CGT union, elected in May 2009, she has been a Director of EDF since November 2009.

**Alexandre Grillat.** Born on 8 December 1971 in Béthune (France), Alexandre Grillat is a graduate of the École Supérieure d'Électricité and is the holder of an advanced degree (*diplôme d'études approfondies*) in electrical engineering. He began his career at EDF in 1996, first at EDF Gaz de France Distribution, where he held various technical management, customer relations and sales



positions, and then at the Strategy Division of the EDF group. He then joined the office of the Senior Executive Vice President of Électricité de Strasbourg before becoming Director of Research for the Networks Department of EDF Strategy Division. Alexandre Grillat is now representative (*chargé de mission*) of the Manager of ERDF in the Alsace Franche-Comté region. Sponsored by the CFE-CGC union, re-elected in May 2009, he has been a Director of EDF since September 2004, when EDF was still a French State-owned industrial and commercial institution (EPIC).

**Philippe Maïssa.** Born on 21 November 1949 in Nice (France), Philippe Maïssa is a graduate of the École Nationale Supérieure des Industries Chimiques in Nancy. After holding positions in the chemical industry, then at the Charbonnages de France Studies and Research Centre, he joined EDF in 1994. He is currently an engineer in the field of combustion and boilers at EDF's Thermal Engineering Centre. Sponsored by the CGT union, elected in May 2009, he has been a Director of EDF since November 2009.

**Marie-Hélène Meyling.** Born on 30 October 1960 in Fontainebleau (France), Marie-Hélène Meyling is a graduate in communication (Université Paris V). She joined EDF in 1982 where she has held a range of communication positions. She then focused on activities relating to the opening of the electricity market as well as support for renewable energy. She is currently Attaché to the EDF Upstream/Downstream Optimisation and Trading

Division. In November 2012, Marie-Hélène Meyling obtained the Company Director Certificate jointly issued by the Institut d'Études Politiques (Institute of Political Studies) in Paris and the Institut Français des Administrateurs (French Institute of Directors). Having sat for four years on the EDF Central Works Council, she has been a Director of EDF, sponsored by the CFDT union, since September 2011.

**Jean-Paul Rignac.** Born on 13 May 1962 in Rodez (France), Jean-Paul Rignac is the holder of a doctorate in energy from the Institut National Polytechnique in Toulouse. He served as secretary of EDF Research and Development's joint generation committee for five years. Since March 1991, he has been a research engineer at EDF's Research and Development Division (Renardières Centre), and currently works on energy efficiency in industrial buildings. Sponsored by the CGT union, re-elected in May 2009, he has been a Director of EDF since November 2007.

**Maxime Villota.** Born on 25 November 1959 in Joeuf (France), Maxime Villota joined EDF in 1981. He began his career at the Dampierre-en-Burly nuclear power plant, before joining the Tricastin nuclear power plant in 1987, where he is currently purchasing policy coordinator. He is a member of the Fédération CGT Mines Énergie trade union. Sponsored by the CGT union, re-elected in May 2009, he has been a Director of EDF since December 2006.

## 14.2 Executive Committee

### 14.2.1 Members of the Executive Committee

The Chairman and Chief Executive Officer chose to surround himself with an Executive Committee within which all the Group's lines of business are represented, as are finance, legal affairs and human resources (see section 16.3 ("Bodies created by Executive Management").

On the filing date of this reference document, the members of the Executive Committee were as follows:

Names	Position
Henri Proglio	Chairman and Chief Executive Officer
Marianne Laigneau	EDF group Senior Executive Vice President, Human Resources
Henri Lafontaine	Group Senior Executive Vice President , Commerce, Optimisation/Trading and Island Energy Systems
Pierre Lederer	Special advisor to the Chairman
Hervé Machenaud	Group Senior Executive Vice President, Generation and Engineering
Thomas Piquemal	Group Senior Executive Vice President, Finance
Vincent de Rivaz	Chief Executive Officer of EDF Energy
Alain Tchernonog	General Secretary

Denis Lépée, Advisor to the Chairman, is Secretary of the Executive Committee.

### 14.2.2 Personal information on members of the Executive Committee

**Marianne Laigneau**, 48 years old, a former student of École Normale Supérieure de Sèvres and of the Ecole nationale d'administration (ENA), holder of the Agrégation degree in classics and a graduate of Institut d'Études Politiques (IEP) in Paris. Marianne Laigneau is a member of the French Council of State (*Conseil d'État*). After leaving ENA, Marianne Laigneau joined the French Council of State and served, amongst other roles, as a legal advisor to the Ministry for Cooperation, Project Director for International Cooperation at the State Reform Commission and a member of the United Nations electoral mission to Mozambique and the EU electoral mission to Gaza. In 1997, she was assigned to the Ministry for Foreign Affairs and served as First Councillor to the French Embassy in Tunis, where she

was in charge of negotiations, political, community and legal affairs and communications. From 2000 to 2002, as a member of the French Council of State, she was specifically responsible for the mission to the Director of ENA, legal advisor to the Ministry for Culture, and senior lecturer in public law at ENA. In 2003, Marianne Laigneau joined Gaz de France as Head of the Institutional Affairs Department at Headquarters, and then in September 2004 became Representative for Public Affairs. She joined the EDF group in 2005 as Legal Counsel, then served as Deputy General Secretary, and in 2007 became General Secretary and a member of the Executive Committee. Marianne Laigneau has been EDF group Executive Vice President, Human Resources since 1 December 2010.

**Henri Lafontaine**, 56 years old, a graduate of the Supélec Engineering School with a Master's in Mathematics, joined EDF in 1983 where he had a wide range of responsibilities in the Distribution Division. In 1997, he became Deputy Executive Vice President of the EDF GDF Distribution Division in Corsica, then Director of the EDF GDF Distribution Division in Marseille in 2000. In 2002, he was appointed as Chief Executive Officer of EDENOR, the largest distributor of electricity in Argentina with 25% of the market. EDENOR was one of the EDF group's main international subsidiaries. In 2005, he went



on to become Director of the project to create a subsidiary for Distribution, which led to the creation of ERDF, then Director of EDF Island Power Systems in 2007, before being made Director of EDF Entreprises in the Commerce Division in 2010. In December 2011, Henri Lafontaine was appointed as the Director responsible for coordinating the EDF group's activities in Commerce, Optimisation/Trading and mainland Europe. Since September 2012, Henri Lafontaine has held the post of Senior Executive Vice President responsible for Commerce, Optimisation/Trading and Island Energy Systems. He is also on the board of several companies, namely EDFI, EDF Energy, Fenice, EDF Luminus and Électricité de Strasbourg.

**Pierre Lederer**, 64 years old, graduate in Mathematics. Pierre Lederer joined EDF in 1974, where he has held a variety of positions in the General Economic Studies Department, the Energy Transmission Department and the Fossil Fuel Generation Department. He was appointed Head of the General Economic Studies Department in 1993, Head of Corporate Strategy in 1996 and then Head of Strategy-Valuation-Optimisation at the Group's Industry Unit in 1999. In 2000, he joined the Executive Board of EnBW, the third largest German energy company, then 45% owned by EDF. In February 2009, Pierre Lederer was appointed Senior Executive Vice President of EDF, in charge of Customers, and member of the Group's Executive Committee. In 2010, he was appointed Group Senior Executive Vice President, in charge of Customers, Optimisation and Trading. At the end of 2010, he was also entrusted with supervising the Group's business in Continental Europe. Pierre Lederer is currently special advisor to the Chairman and Chief Executive Officer.

**Hervé Machenaud**, 65 years old, a former student of the École Polytechnique (1968), engineer of the École des Ponts et Chaussées (civil engineering school) and a graduate of the Institut d'Études Politiques in Paris (1973). Hervé Machenaud began his career as Director of the Urban Planning Division at the Ivory Coast Ministry of Planning in 1973, and then undertook a variety of assignments on the African continent for the World Bank before returning to France in 1978 as a civil engineer in Ille-et-Vilaine. Hervé Machenaud joined the EDF group in 1982 as Deputy Director of Development at the Paluel nuclear power plant. From 1984 to 1989, he took charge of the Group's expansion into China, in particular the construction and commissioning of the Daya Bay nuclear power plant. Between 1990 and 1995, Hervé Machenaud held the position of Director of the French National Nuclear Infrastructure Centre (CNEN – *Centre National d'Équipement Nucléaire*), responsible for the Group's French and international nuclear programs. In this post, he coordinated the design, construction and commissioning of the N4 series (nuclear plants in Chooz and Civaux), currently the world's most advanced reactors, equipped with a computer-assisted control system which remains unique. From 1995 to 1998, he was EDF's Deputy Director of Infrastructure, responsible for Resources, Management and International Development. From 1998 to 2002, he served as EDF's Director of Generation and Transmission, then Deputy Director of the Industry Branch. From 2002 to 2010, he was based in Beijing as EDF's Executive Vice President, Asia-Pacific, where his role was to enhance the Group's industrial expertise, particularly nuclear, and to ensure it had access to technological innovations in China, Japan, India and the Great Mekong region. In particular, he spearheaded the joint venture projects in the following sectors: nuclear (Taishan), thermal (Sanmenxia), hydraulic and wind generation in China, Vietnam (Phu My plant) and Laos (Nam Theun dam). Hervé Machenaud is currently Group Senior Executive Vice President, Generation and Engineering and Director, Asia-Pacific.

**Thomas Piquemal**, 43 years old, graduate of the École Supérieure des Sciences Économiques et Commerciales (ESSEC). Thomas Piquemal began his career in 1991 with audit firm Arthur Andersen, where he specialised in restructuring companies in difficulty. In 1995, he joined the Mergers & Acquisitions Department of Lazard Frères bank, becoming Executive Director 5 years later. In this role, he was involved in major financial and strategic transactions in the utilities, distribution, financial services and real estate

sectors, including capital restructuring, privatisation and IPOs. In 2008, he took over responsibility in London for the strategic partnership signed between Lazard and the American investment fund Apollo for investment in Europe. In January 2009, Thomas Piquemal joined Veolia Environnement as Senior Executive Vice President in charge of Finance and joined the Group's Executive Committee. In this post, he devoted his efforts to debt reduction, in particular through an asset disposal program. Committed to the fight against social exclusion, in 2008, together with three-time world boxing champion Christophe Tiozzo, Thomas Piquemal founded the "Académie Christophe Tiozzo", whose mission is to promote the social and professional integration of young people from deprived areas. Thomas Piquemal is currently Group Senior Executive Vice President Finance and Director, North America.

**Vincent de Rivaz**, 59 years old, graduate in Engineering from the École Nationale Supérieure d'Hydraulique in Grenoble. Vincent de Rivaz began his career with the EDF group in 1977 as hydraulic engineer in the External Engineering Department, participating in the building of hydroelectric works in Africa, Guyana and New Caledonia. From 1985 to 1991 he was responsible for the Far East Region at the International Division and contributed to the Group's development in China in the nuclear, thermal, hydraulic and distribution sectors. From 1991 to 1994 he was Director of the EDF National Centre for Hydraulic Equipment, responsible for engineering on the EDF group's hydraulic projects, in France and abroad, and specifically managed the launch of the Nam Theun II project in Laos. In 1995 he was appointed Deputy Director of the International Division, and then became Director of Major Projects. In this capacity, he contributed to the development of EDF's investment projects in IPPs, specifically in China, Egypt, Mexico, Vietnam and Laos, as well as acquisitions of companies in Poland, Switzerland and England, including London Electricity in 1998. In 1999, Vincent de Rivaz was appointed Vice President of the Corporate Finance Division and in 2000 became Director of Strategy and Financial Operations. Appointed Chairman and Chief Executive Officer of LE Group in England in February 2002, he directed the acquisition and integration operations of Seaboard, with the former London Electricity and the grids of eastern England, creating EDF Energy in 2003. Since 2007, he has led the development of the new EDF nuclear plant in Great Britain. In 2008 and 2009, the acquisition then integration of British Energy, the largest British nuclear plant operator, made EDF Energy the leader in the British electricity market. In 2010, he managed the implementation of the disposal of EDF Energy's distribution network activity. Vincent de Rivaz is currently Chief Executive Officer of EDF Energy.

**Alain Tchernonog**, 68 years old, holder of a PhD in law, is a graduate of the Institut d'Administration d'Entreprises. Alain Tchernonog started his career in 1972 as a lawyer specialising in international law at the *Centre National d'Études Spatiales* (French national space agency, CNES) before becoming head of the Legal Department of ANVAR (French national technology transfer agency) in 1974. From 1979 to 1990, he was Director of the Contracts Department at Roussel-UCLAF. From 1990, he held the position of General Counsel for the Pierre Fabre Group (1990-1995), then Compagnie Générale d'Entreprises Automobiles (1995-2000). In 2001, he joined the Veolia Environnement Group as General Counsel then became General Secretary in January 2007. Alain Tchernonog is currently Group General Secretary.

**Denis Lépée**, 44 years old, graduate from the Institut d'Études Politiques in Paris, graduate in history. Denis Lépée served as advisor to the Secretary General of the Rassemblement Pour la République political party from 1995 to 1997, then as Private Secretary to the President of the General Council of the Oise département from 1998 to 2003. He then joined Veolia Environnement before becoming in 2007 special advisor to Henri Proglio, Chairman and Chief Executive Officer. Denis Lépée joined EDF on 25 November 2009 as advisor to the Chairman. He is also the author of four novels and several biographies. Denis Lépée is currently Advisor to the Chairman and Secretary of the Group Executive Committee.

## 14.3 Absence of family ties, convictions and conflicts of interest among members of the administrative bodies and Executive Management

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### 14.3.1 Absence of family ties

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To EDF's knowledge, there are no family relationships among members of the administrative bodies or Executive Management.

### 14.3.2 Absence of convictions for fraud

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To EDF's knowledge, within at least the past five years, no member of the EDF Board of Directors or Executive Management has been subject to: (i) a conviction for fraud, (ii) bankruptcy, receivership or liquidation, or (iii) conviction and/or official public sanction issued by the statutory or regulatory authorities.

Moreover, to EDF's knowledge, no member of the EDF Board of Directors or Executive Management has been prevented by a court from serving as a member of an administrative, management or supervisory body of an issuer or from participating in the management or direction of an issuer's affairs during the past five years.

### 14.3.3 Conflicts of interest

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To the Company's knowledge, on the date of filing of this reference document, there are no potential conflicts of interest involving EDF between the duties of the members of the Company's Board of Directors and Executive Management and their private interests or other duties.

Subject to the specific legal and regulatory provisions applicable to the members of the Company's Board of Directors (see section 16.2.1.1 ("Members of the Board")), to the Company's knowledge, no arrangements or agreements have been entered into with shareholders, clients, suppliers or others under which a member of the Board of Directors or Executive Management has been appointed in this capacity.

To the Company's knowledge, no member of the Board of Directors has agreed to restrict for a fixed period of time his ability to sell his holdings in the Company's capital, except for the restrictions resulting from the Stock Exchange Ethics Code of EDF (see section 16.5 ("Stock Exchange Ethics Code")).

In addition, corporate officers holding shares in mutual funds through an EDF group Company Savings Plan invested in EDF shares, or who have acquired shares from the French State within the legal framework of the privatisation, are subject to the lock-in and non-transferability rules resulting from the provisions applicable to these transactions.





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# 15 Compensation and benefits

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## 15.1 Compensation of corporate officers

The compensation and benefits of all kinds paid in the 2012 fiscal year to corporate officers by the Company and the companies it controls are listed below.

The tables below were drawn up in accordance with the format recommended by the AFEP-MEDEF Consolidated Code of Corporate Governance and the AMF Recommendation of 22 December 2008.

### 15.1.1 Total compensation of the Chairman and Chief Executive Officer

The table below presents the summary of the compensation of all kinds owed to the Chairman and Chief Executive Officer for the 2011 and 2012 fiscal years.

As stated in section 15.3, the Chairman and Chief Executive Officer receives no stock options or performance stock.

#### Summary table of compensation and options and shares awarded to the Chairman and Chief Executive Officer <sup>(1)</sup>

(in euros)	2012 fiscal year	2011 fiscal year
<b>Henri Proglio, Chairman and Chief Executive Officer</b>		
Compensation due for the fiscal year	1,291,257	1,592,820
Valuation of options awarded during the fiscal year	none	none
Valuation of performance stock awarded during the fiscal year	none	none
<b>TOTAL</b>	<b>1,291,257</b>	<b>1,592,820</b>

(1) Table n° 1 of the AMF Recommendation of 22 December 2008.

The table below presents the compensation of all kinds owed and paid to the Chairman and Chief Executive Officer for the 2011 and 2012 fiscal years.

#### Summary table of the compensation of the Chairman and Chief Executive Officer <sup>(1)</sup>

(in euros)	2012 fiscal year		2011 fiscal year	
	Amounts due for the fiscal year	Amounts paid during the fiscal year	Amounts due for the fiscal year	Amounts paid during the fiscal year
<b>Henri Proglio, Chairman and Chief Executive Officer</b>				
Fixed compensation	862,500 <sup>(2)</sup>	1,000,000	1,000,000	1,000,000
Variable compensation	423,750 <sup>(3)</sup>	588,000 <sup>(4)</sup>	588,000	555,708
Exceptional compensation	none	none	none	none
Directors' fees	n/a	n/a	n/a	n/a
Benefits in kind <sup>(5)</sup>	5,007	5,007	4,820	4,820
<b>TOTAL</b>	<b>1,291,257</b>	<b>1,593,007</b>	<b>1,592,820</b>	<b>1,560,528</b>

n/a: not applicable

(1) Table n° 2 of the AMF Recommendation of 22 December 2008.

(2) Amount due after retroactive adjustment: the fixed portion of the compensation for 2012, set at 1 million euros by the Board of Directors on 5 April 2012, was adjusted from 1 October 2012 retroactively in connection with the implementation of decree n°2012-915 of 26 July 2012. See sections 15.1.1.1 and 15.1.1.2, below.

(3) Amount due after retroactive adjustment: the variable portion of the compensation for 2012, limited to 60% of the amount of fixed compensation for 2012 in accordance with the decision of the Board of Directors of 5 April 2012, was adjusted by being applied to the fixed portion of the compensation paid from January to September 2012 in connection with the implementation of decree n°2012-915 of 26 July 2012. See sections 15.1.1.1 and 15.1.1.2, below.

(4) Variable portion due for the 2011 fiscal year paid during 2012.

(5) The benefits in kind consist of a company car and the energy benefit in kind (in euros).

## 15.1.1.1 Terms and conditions for the setting of the compensation of the Chairman and Chief Executive Officer

In accordance with article 3 of decree n° 53-707 of 9 August 1953 and article L. 225-47 of the French Commercial Code, the components of Mr. Henri Proglio's compensation are set by the Company's Board of Directors, on proposal from the Nominations and Compensation Committee, as approved by the Minister in charge of economy and the Minister for Energy.

Decree n° 2012-915 of 26 July 2012 modified the decree of 9 August 1953 and specified a gross annual limit of 450,000 euros to compensations payable to corporate officers of public companies to which such decrees is applicable.

## 15.1.1.2 Setting of fixed and variable compensation for the 2011 and 2012 fiscal years

### Compensation for the 2011 fiscal year

On recommendation from the Nominations and Compensation Committee on 14 March 2011 approved by the Minister for the Economy and the Minister for Energy by letter dated 2 May 2011 in accordance with the decree of 9 August 1953, the Board of Directors, meeting on 24 May 2011, had set the fixed portion of the Chairman and Chief Executive Officer's gross annual compensation at 1 million euros for the 2011 fiscal year.

A variable portion may be added to this fixed portion, capped at 60% of the fixed amount, consisting of a quantitative portion of 70% and a qualitative portion of 30%, subject to the meeting of objectives set by the Board of Directors. The Board of Directors met on 24 May 2011 and decided to make the quantitative component of the variable portion of the Chairman and Chief Executive Officer's compensation contingent on the meeting of quantitative objectives based specifically on EBITDA, free cash flow, net debt/EBITDA ratio and the nuclear fleet availability factor (Kd), according to the weightings set by the Board of Directors.

In accordance with these criteria, the Board of Directors' meeting on 5 April 2011, set, on proposal from the Nominations and Compensation Committee as approved by the Minister for the Economy by letter dated 23 March 2012, the variable portion of the Chairman and Chief Executive Officer's 2011 compensation at 588,000 euros, paid during 2012.

### Compensation for the 2012 fiscal year

On proposal from the Nominations and Compensation Committee on 12 March 2012 as approved by the Minister for the Economy by letter dated 23 March 2012, in accordance with the decree of 9 August 1953, the Board of Directors, meeting on 5 April 2012, had set the fixed portion

of the Chairman and Chief Executive Officer's gross annual compensation at 1 million euros for the 2012 fiscal year.

A variable portion may be added to this fixed portion, capped at 60% of the fixed amount, consisting of a quantitative portion of 70% and a qualitative portion of 30%, subject to the meeting of objectives set by the Board of Directors. The Board of Directors, meeting on 5 April 2012, had decided to make the quantitative portion of the variable portion of the Chairman and Chief Executive Officer's compensation contingent on the meeting of quantitative objectives based specifically on EBITDA, free cash flow, net debt/EBITDA ratio and the nuclear fleet availability factor (Kd), according to the weightings set by the Board of Directors.

On proposal from the Nominations and Compensation Committee of 13 March 2013, the Board of Directors, meeting on 3 April 2013, acknowledged the implementation of the decree of 26 July 2012 from 1 October 2012 and decided consequently:

- To set the Chairman and Chief Executive Officer's compensation, from 1 October 2012 retroactively, to the ceiling level laid down by decree dated 26 July 2012 i.e. a fixed annual compensation of 450,000 euros, leaving the variable portion of the compensation from that date;
- To set the variable portion of the Chairman and Chief Executive Officer's compensation due for the period from January to September 2012, at 423,750 euros, representing 56,5% of the fixed compensation over this period, and
- Acknowledged that, given the sums already paid during the 2012 fiscal year to the Chairman and Chief Executive Officer, the amount of the variable portion of the compensation for 2012 financial year, to be paid in 2013, amounts to 286,250 euros.

## 15.1.1.3 Other items of compensation

Henri Proglio does not receive any Directors' fees for his duties as Chairman of the Board of Directors and Director of EDF. He also does not receive any Directors' fees for the positions held in companies controlled by EDF, or any compensation of any kind whatsoever from the controlled companies.

The Company allocated no stock options to the Chairman and Chief Executive Officer in 2012 and he exercised no options during the fiscal year. Similarly, no performance stock was allocated to the Chairman and Chief Executive Officer during the past fiscal year, and no performance stock became available.

### Employment contract, specific pension plans, severance payments and non-competition clause

Mr. Henri Proglio has no special EDF pension plan, has received no hiring bonus and does not benefit from any severance payment for the termination of his duties within the Company. Mr. Henri Proglio has no employment contract with the Company.

Chairman and Chief Executive Officer <sup>(1)</sup>	Employment contract	Supplemental pension plan	Compensation or benefits for termination or modification of duties	Non-competition clause compensation
Henri Proglio, Chairman and Chief Executive Officer	none	none	none	none

(1) Table n° 10 of the AMF Recommendation of 22 December 2008.

## 15.1.2 Total compensation of Directors

The table, below, shows the amount of Directors' fees paid in 2011 and 2012 to the members of the Board of Directors.

The amounts paid during the fiscal year correspond to the Directors' fees allocated for the first half of that fiscal year (50% of the fixed portion) and for the second half of the previous fiscal year (50% of the fixed portion and 100% of the variable portion).

### Table of Directors' fees paid to Directors

<i>In euros</i>	2012 <sup>(1)</sup>	2011 <sup>(2)</sup>
Philippe Crouzet	39,355	32,000
Mireille Faugère	46,452	34,000
Michael Jay	36,129	29,000
Bruno Lafont	41,290	20,000
Pierre Mariani	36,774	32,000
Henri Proglio	n/a	n/a
<b>TOTAL</b>	<b>200,000</b>	<b>147,000</b>

*n/a: non applicable.*

*(1) For the second half of 2011 and the first half of 2012.*

*(2) For the second half of 2010 and the first half of 2011.*

### Budget and distribution of Directors' fees

The Directors representing the French State as well as those representing the employees hold office without fees in accordance with French law n° 83-675 of 26 July 1983 concerning the democratisation of the public sector, and the Chairman of the Board of Directors receives no Directors' fees

Upon recommendation of the Nominations and Compensation Committee and approval by the Minister for the Economy and the Minister for Energy in accordance with article 3 of decree n° 53-707 of 9 August 1953, the Board of Directors submits for the approval of the Shareholders' Meeting the budget for the Directors' fees to be distributed to Directors based on the allocation approved by the Board of Directors. The Shareholders' Meeting held on 24 May 2011, on proposal of the Board of Directors, approved the amount of 200,000 euros for the annual budget for the Directors' fees for the 2011 fiscal year and the subsequent fiscal years, until a new decision is made by the Meeting.

Since 2005, the amount of Directors' fees paid has been tied to attendance at the meetings of the Board of Directors and the specialised committees. The current terms and conditions for the allocation of the annual budget for Directors' fees applicable from the 2011 fiscal year were adopted by the Board of Directors on 22 June 2011, on proposal from the Nominations and Compensation Committee. The total budget is divided into a fixed portion and a variable portion of 100,000 euros each, distributed as follows:

- the fixed portion of 100,000 euros is shared in equal parts between the Directors, i.e. the sum of 20,000 euros each;
- the distribution of the variable portion of 100,000 euros between the Directors is set by applying a coefficient varying based on the type of meetings (Board or committee) and based on the specific positions held by each Director (committee member or Chairman): a coefficient of 2 for presence at a meeting of the Board of Directors, a coefficient of 2 for the presence of a Chairman at a committee meeting and, finally, a coefficient of 1 for the presence of a Director as a member at a committee meeting. The variable portion is divided by the total of the coefficients for the fiscal year in order to set the unit value of the coefficient.

## 15.2 Provisions for pensions, retirement and other benefits

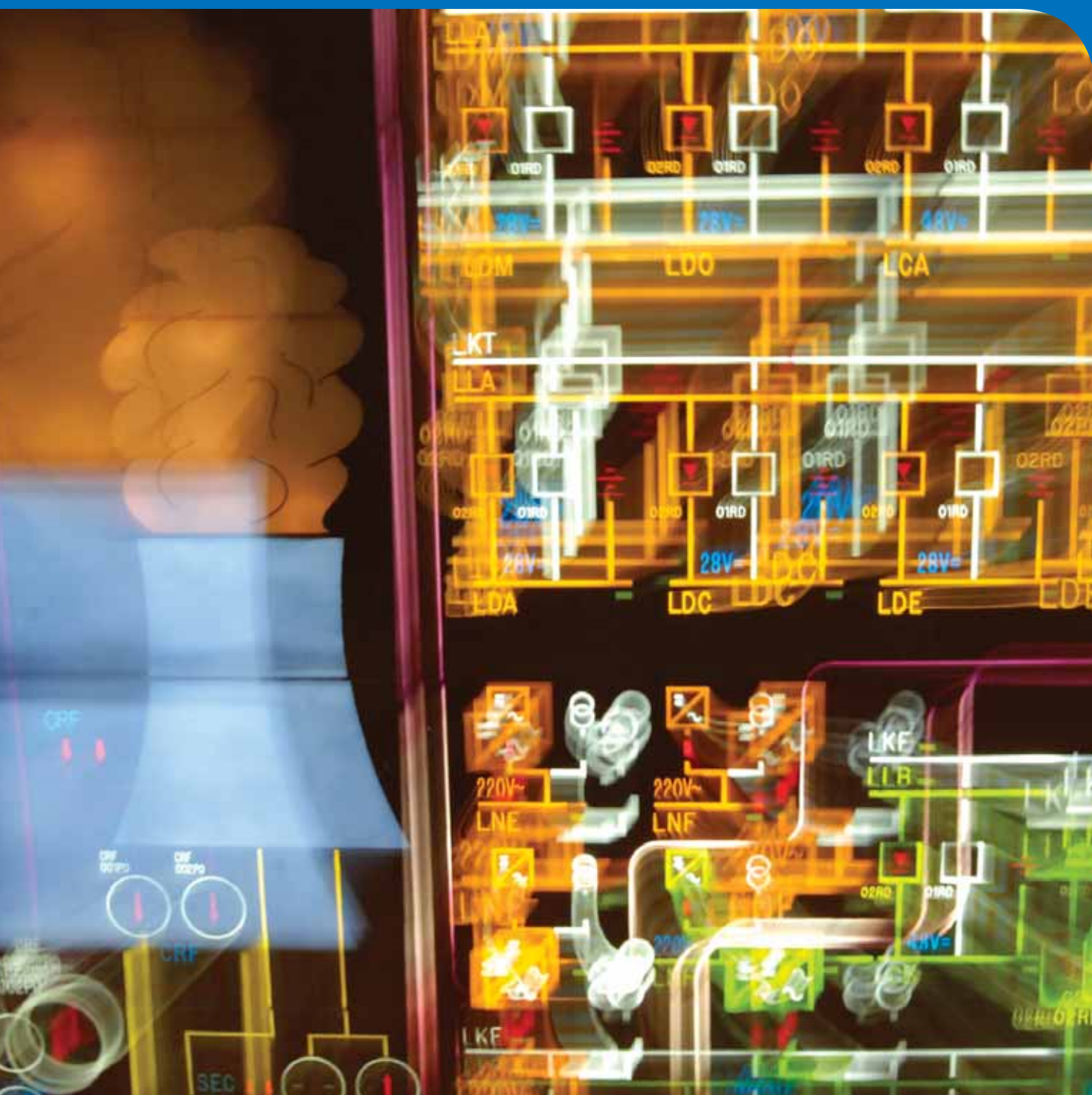
The Company's corporate officers as well as members of the Executive Committee do not benefit from a special pension plan.

## 15.3 Stock options – Bonus shares

The Company has not implemented any stock options plans and the corporate officers receive no allocation of bonus shares <sup>1</sup> (or "performance stock").

<sup>1</sup>. With the exception of any Directors elected by the employees who may benefit from the systems implemented by the Company for the benefit of all its employees.







# 16 Functioning of administrative and management bodies

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## 16.1 Corporate Governance Code

EDF adheres to the consolidated AFEP-MEDEF Code, which is the Corporate Governance Code to which the Company refers, in accordance with article L. 225-37 of the French Commercial Code<sup>1</sup>, subject to the specific laws and regulations applicable to EDF.

These specific laws and regulations, which result from EDF's status as a state-owned company and in particular the application to the Company of French law n° 83-675 of 26 July 1983 relating to the democratisation of the public sector and decree n° 53-707 of 9 August 1953, relate specifically to the division of the Board of Directors into three groups (see sections 14.1.1 ("Members of the Board of Directors") and 16.2.1.1 ("Members of the Board")), its impact on the proportion of independent Directors

of the Board and its committees (see section 16.2.1.6 ("Evaluation of Director independence") and 16.2.3.1 ("Audit Committee")), the terms and conditions for the setting of the compensation of the Chairman and Chief Executive Officer (see section 15.1.1.1 ("Terms and conditions for the setting of compensation")), the 5-year length of the terms of the Directors and the re-election of the entire Board of Directors (see section 16.2.1.2 ("Term of office of the Directors")) or otherwise the terms and conditions for the appointment of the Chairman and Chief Executive Officer of EDF and the method of executive management (see section 16.2.1.4 ("Method of Executive Management and powers of the Chairman and Chief Executive Officer")).

## 16.2 Functioning of the Board of Directors

The Board's internal rules of procedure set the principles of its functioning and the terms and conditions according to which the Board and its specialised committees fulfil their duties. It also defines the role and powers of the Chairman and Chief Executive Officer. These internal rules of procedure are reviewed, as needed, in particular to take into account legal and regulatory changes.

### 16.2.1 Composition and functioning of the Board of Directors

#### 16.2.1.1 Members of the Board

In accordance with article 6 of French law n° 83-675 of 26 July 1983 relating to the democratisation of the public sector, the Company's Board of Directors is comprised of eighteen members, one third of whom are elected by the employees and two-thirds appointed by the Shareholders' Meeting on recommendation from the Board of Directors, with the exception of the French State representatives who are appointed by decree.

On the filing date of this reference document, the Board of Directors consists of 6 Directors elected by employees, 6 Directors representing the French State and 6 Directors appointed by the Shareholders' Meeting.

The list of Directors and their personal information appear in section 14.1 ("Board of Directors").

#### Balanced representation of men and women on Boards of Directors

In accordance with French law n° 2011-103 of 27 January 2011 relating to the balanced representation of women and men on Boards of Directors and Supervisory Boards, and equal access to employment, EDF, as a French public limited company (*société anonyme*) listed on the stock exchange and a state-owned company, is subject (a) to the provisions applicable to listed companies (with regard to Directors appointed by the Shareholders' Meeting) and (b) to the provisions applicable to state-owned companies (for the Directors appointed by decree).

In accordance with the aforementioned law, the proportion of Directors of each gender appointed by the Shareholders' Meeting may not be less than 20% from 2014, then 40% from 2017.

Moreover, the proportion of Directors of each gender appointed by decree shall not be less than 20% after the first re-election of the Board of Directors following publication of the law, i.e., in 2014 for EDF, and shall not be less than 40% after the second re-election of the Board of Directors, i.e., in 2019.

On the date of filing of this reference document, the EDF Board of Directors included four women, i.e. a proportion of 22.2% of women compared to the Board as a whole. One is a Director appointed by the Shareholders' Meeting, the second is a Director representing the French State and the other two are Directors elected by employees.

Decree n° 2012-406 of 23 March 2012 added a Government Commissioner to the Company's Board of Directors. The Government Commissioner attends, but is not entitled to vote at, the meetings of the Board of Directors. He/she may make observations at the Shareholders' Meeting. By order of 15 June 2012, Mr. Pierre-Marie Abadie, Energy Manager at the General Directorate for Energy and Climate (DGEC), reporting to the Minister for Ecology, Sustainable Development and Energy, was appointed Government Commissioner.

Finally, the Head of the French State General Economic and Financial Supervisory Mission to the Company and the Secretary of the Central Works Council attend the meetings of the Board of Directors, but are not entitled to vote.

#### 16.2.1.2 Term of office of Directors

In accordance with article 11 of the law of 26 July 1983 relating to the democratisation of the public sector, the term of office of members of the Board of Directors is five years. They remain in office until the first meeting of the new Board of Directors. The Board is re-elected as a whole after 5 years. Therefore, the terms of office of the current Directors will expire on 22 November 2014 at midnight.

In the event of vacancy of the seat of a member of the Board of Directors for any reason whatsoever, his/her replacement will hold office only for the remaining duration of the term until the re-election of the full Board of Directors.

1. After having considered the AFEP-MEDEF recommendations of October 2008 on the compensation of Executive Directors of companies, the Company's Board of Directors met as soon as 17 December 2008 to approve these recommendations, deeming that they are in line with EDF's corporate governance approach, and that they had already been implemented by the Company.

In the event of vacancy of the seat of a Director elected by the Shareholders' Meeting, a Shareholders' Meeting must be convened in order to make a new appointment on recommendation from the Board of Directors: co-option is not authorised for EDF.

In accordance with article 12 of the law on the democratisation of the public sector, Directors representing the French State may be dismissed at any time by decree, Directors appointed by the Shareholders' Meeting may be dismissed at any time by the Shareholder's Meeting and, finally, Directors elected by employees may be dismissed individually for serious negligence in the performance of their duties upon decision of the President of the District Court (*Tribunal de Grande Instance*), delivered in the form of an emergency ruling at the request of the majority of members of the Board.

### 16.2.1.3 Obligations and duties of Directors

The internal rules of procedure of the Board of Directors state that its members are subject to obligations such as: acting in the corporate interest of the Company, informing the Board of situations of conflict of interest, and refraining from voting in any decision in which there might be a conflict of interest, fulfilling the obligation of confidentiality and complying with the EDF Stock Exchange Ethics Charter. Members of the Board and the Chairman and Chief Executive Officer are required to immediately inform the Board of any agreement entered into by the Company in which they hold a direct or indirect interest, or which might be entered into through an intermediary.

Each Director receives a Directors' guide, regularly updated, which specifically contains the following documents: the Company's articles of association, the internal rules of procedure of the Board of Directors and its committees, the Stock Exchange Ethics Code (see section 16.5 ("Stock Exchange Ethics Code"), below) and the AFEF-MEDEF Code of Corporate Governance.

### 16.2.1.4 Method of Executive Management and powers of the Chairman and Chief Executive Officer

The EDF articles of association state that the Chairman of the Board of Directors is the Executive Manager of the Company and holds the title of Chairman and Chief Executive Officer. The "non-separated" executive management structure is therefore set out in the Company's articles of association. The Board's internal rules of procedure, and in particular the limitations it applies to the powers of the Chief Executive Officer, are intended to ensure a balance between the Chairman and Chief Executive Officer and the Board of Directors, whilst preserving the flexibility and responsiveness necessary in the administration and management of the Company.

EDF's Chairman and Chief Executive Officer is appointed by decree of the President of the Republic, upon proposal from the Board of Directors. He may be dismissed by decree in accordance with article 10 of the law on democratisation of the public sector.

In accordance with the provisions of article 13 of the Constitution, the Chairman is appointed based on the candidates' interviews and the opinion of the permanent committees of the French National Assembly and Senate. Henri Proglio was appointed EDF Chairman and Chief Executive Officer by decree of 25 November 2009.

Subject to the specific legal provisions governing public sector companies and the powers specifically reserved by law or by the articles of association to the Board of Directors or to Shareholders' Meetings, and the limits to the powers of the Chairman and Chief Executive Officer provided for by the internal rules of procedure of the Board of Directors as internal rules (see section 16.2.1.5 ("Powers and duties of the Board of Directors") below), the Chairman and Chief Executive Officer is vested with the most extensive powers to act on behalf of the Company under all circumstances, within the limits of the corporate purpose. The Chairman and Chief Executive Officer organises and supervises the work of the Board of Directors and reports to the Shareholders' Meeting. He oversees the proper running of the bodies of the Company and, in particular, ensures that the Directors are in a position to fulfil their duties.

### 16.2.1.5 Powers and duties of the Board of Directors

In accordance with the law, the Board of Directors sets the strategies for the Company's activities and oversees their implementation. Subject to powers expressly attributed to the Shareholders' Meetings and as limited by the Company's corporate purpose, the Board may consider any question relating to the proper running of the Company and acts, through its deliberations, on any such issue.

Moreover, in accordance with article 7 of the French law on the democratisation of the public sector, the Board deliberates on all strategic, economic, financial and technological strategies of the Company and the Group and on the matters specifically assigned to the Board by law, or which the Board retains.

In accordance with its internal rules of procedure, the Board of Directors alone is competent to authorise the following transactions:

- transactions of external or internal growth or disposals involving a financial exposure for the Company exceeding €200 million; this threshold falls to €50 million for acquisitions not in line with the Company's strategic objectives;
- real estate transactions exceeding €200 million;
- certain financial transactions, whenever their amount exceeds a value set each year by special decision of the Board; for the 2012 fiscal year, the Board set: (i) at €500 million, the total authorised budget for sureties, endorsements or guarantees (the Chairman and Chief Executive Officer reports to the Board on any transaction of this kind that exceeds €100 million, granted on behalf of the Company or by a company controlled by the Company) and (ii) at €5 billion, the individual unit amount of certain financial transactions; for the 2013 fiscal year, the Board set: (i) at €1.5 billion, the total authorised budget for sureties, endorsements or guarantees from 20 January 2013 (the Chairman and Chief Executive Officer reports to the Board on any transaction of this kind that exceeds €100 million, granted on behalf of the Company or by a company controlled by the Company);
- contracts (supplies, work or services with or without financial commitment) involving amounts, including any necessary subsequent amendments signed during the same year, equal to or exceeding €200 million, or between €100 million and €200 million if these contracts relate to a new strategic direction or a new business line for the Group;
- long-term contracts for the purchase or sale of energy, CO<sub>2</sub> emission credits and quotas, by the Company or by a company it exclusively controls, for annual volumes or amounts in excess of: 10 TWh for electricity, 20 TWh for gas (detailed information must also be provided on long-term gas purchase or sale agreements greater than 5 TWh and less than 20 TWh at the meeting of the Board of Directors following their signing) and €250 million for coal and carbon dioxide;
- strategies relating to upstream and downstream operations of the nuclear fuel cycle;
- operations involving the transfer of obligations relating to decommissioning or downstream processes of the nuclear fuel cycle.

The Board of Directors sets the framework of the policy for the collection and management of assets for hedging nuclear commitments, specifically ruling on asset/liability management, asset allocation strategy, asset quality and the method of selecting any financial intermediaries. It sets limits on market, counterparty and liquidity risks.

Finally, in accordance with the law of 27 January 2011 relating to the balanced representation of women and men on Boards of Directors and Supervisory Boards and equal access to employment, the Board of Directors must annually approve the Company's policy with regard to equal access to employment and equal pay.

### 16.2.1.6 Evaluation of Director independence

The AFEP-MEDEF Corporate Governance Code recommends that, in companies with a controlling shareholder, the proportion of independent Directors should be at least one third of the Board of Directors. Given the specific legal framework applicable to the Company, the Board of Directors has among its 18 members, 12 Directors, 6 of whom represent the French State and 6 represent employees, who may not meet the independence criteria defined by the AFEP-MEDEF Code.

At a joint meeting on 8 January 2013, the Ethics Committee and Nominations and Compensation Committee examined the individual situations of Directors. Upon recommendation from these committees, at its meeting on 30 January 2013, the Board of Directors conducted the annual evaluation of the independence of the Directors based on the criteria defined by the AFEP-MEDEF Corporate Governance Code, and confirmed the classification as independent Directors of Mrs. Faugère and Messrs. Crouzet, Jay, Lafont and Mariani as these Directors had no relations with the Company, its Group or its Management that might compromise the exercise of their freedom of judgment.

The Company's Board of Directors, therefore, had 5 independent Directors out of a total of 18 members.

### 16.2.1.7 Evaluation of the functioning of the Board of Directors

In accordance with the AFEP-MEDEF Code, the Board's internal rules of procedure state that the Ethics Committee will report annually on the functioning of the Board of Directors and propose areas for improvement. Once a year, therefore, the Board dedicates one point on its agenda to this evaluation and holds a discussion on its functioning in order to improve its efficiency and ensure that important issues are appropriately prepared and discussed by the Board. Furthermore, every three years, this evaluation is conducted by an external consultant under the supervision of the Ethics Committee.

The last evaluation conducted by a specialist external consultant was in 2010. In 2012, as in 2011, the annual evaluation was conducted internally using a questionnaire, approved by the Board of Directors upon recommendation from the Ethics Committee. The results of this evaluation, reviewed by the Ethics Committee and presented to the Board of Directors on 30 January 2013, revealed a high level of satisfaction among Directors regarding the implementation of good governance rules by the Company. The holding of a strategic seminar as well as the contribution of the full Board of Directors to the Group's strategic reflection was again saluted by its Strategy Committee, as was the coordination of the roles between the specialist committees and the Board.

### 16.2.1.8 Information and training of Directors

Under the terms of the Board's internal rules of procedure, the Board periodically receives information on the financial, treasury and commitments position of the Company and the Group, as well as information such as the financial balance sheet for agreements approved by the Company for the purchase of nuclear fuels, a performance review of the Company's principal subsidiaries on the occasion of the presentation of the annual and semi-annual financial statements, sales policy, purchasing and subcontracting policy and human resources policy.

A document reviewing the Group's current major sectors of business and the market trends, as well as the economic, financial and institutional context is prepared for each meeting of the Board of Directors.

The principal events relating to the Company occurring between two meetings of the Board are reported to the Directors.

The Directors can add to this information by meeting with the principal managers of the Company or Group.

In addition, information meetings are organised on complex matters and major strategic importance issues, together with any training requested by Directors.

### 16.2.1.9 Compensation

The principles and rules adopted by the Board of Directors in order to set the compensation of the Chairman & Chief Executive Officer and the terms and conditions for the distribution of the Directors' fees, as well as the amounts paid to Directors in 2012, appear in section 15 of this reference document.

## 16.2.2 Activities of the Board of Directors in 2012

The Board of Directors meets as often as the interest of the Company requires in accordance with applicable legislative and regulatory provisions.

Over the 2012 fiscal year, the Board of Directors met 9 times and 27 committee meetings were held to prepare for these meetings. Board meetings lasted an average of two and a half hours, allowing for an in-depth review and discussion of the items on the agenda. The Board also met once for a strategic seminar.

The average attendance rate for Directors at the meetings of the Board was 89.5% for 2012.

In 2012, the Board of Directors reviewed and authorised, in addition to numerous issues relating to the Company's current activity, major issues such as the acquisition of exclusive control of the Italian company Edison, the sale of Sutton Bridge power station (United Kingdom) in accordance with the commitment made by EDF to the European Commission for the purposes of the acquisition of British Energy in late 2008.

In addition, the Board attended a strategic seminar to examine the impact on the Group of the changing energy situation and competitors' policies, as well as strategic areas for growth and financial trajectory.

## 16.2.3 Board of Directors' committees

To perform its missions, the Board of Directors has created five committees to review and prepare certain projects before they are presented to the whole Board. These committees are: the Audit Committee, the Nuclear Commitments Monitoring Committee, the Strategy Committee, the Ethics Committee and the Nominations and Compensation Committee.

The members, functioning and duties of the committees are governed by the internal rules of procedure of the Board of Directors.

Directors who are members of these committees are appointed by the Board of Directors. The Chairman of each committee is appointed by the Board on proposal from the members of the committee.

The Chairmen of the Board committees are:

- Mr. Pierre Mariani for the Audit Committee;
- Mr. Philippe Crouzet for the Nuclear Commitments Monitoring Committee;
- Mr. Henri Proglio for the Strategy Committee;
- Mrs. Mireille Faugère for the Ethics Committee;
- Mr. Bruno Lafont for the Nominations and Compensation Committee.

The Government Commissioner attends, without the right to vote at, the meetings of these committees.

The composition of each committee is described below as at the 15 March 2013.



The Head of the French State General Economic and Financial Supervisory Mission to the Company is invited to attend the meetings of these committees.

The work of the committees is organised within a program prepared for the year. Meetings are recorded in the form of written minutes and reports, which are submitted by the Committee Chairman to the Board of Directors.

### 16.2.3.1 Audit Committee

#### Functioning and members

The Audit Committee performs the duties assigned to it in accordance with the provisions of order n° 2008-1278 of 8 December 2008, which transposed into French law the Eighth European Directive of 17 May 2006 on statutory audits of accounts.

Article L. 823-19 of the French Commercial Code states that at least one member of the committee must have specific skills in financial or accounting matters and be independent based on the criteria defined and made public by the Board of Directors.

At a joint meeting held on 14 January 2011, the Ethics Committee and the Nominations and Compensation Committee reviewed the situation of Mr. Pierre Mariani and issued a notice to the Board of Directors. The Board of Directors, meeting on 21 January 2011, found that Mr. Mariani has the specific financial and accounting skills based on the criteria recommended by the AMF in its report on the Audit Committee dated 22 July 2010. On 30 January 2013, the Board of Directors confirmed Mr. Pierre Mariani's capacity as an independent Director (see section 16.2.1.6 above). He therefore meets the criteria of both expertise and independence in accordance with the article L. 823-19 of the French Commercial Code.

The Audit Committee is chaired by Mr. Pierre Mariani, an independent Director appointed by the Shareholders' Meeting and an individual outside the EDF group. The other members of the committee are Messrs. David Azéma and Yannick d'Escatha, Directors representing the French State, as well as Mrs. Marie-Hélène Meyling and Messrs. Alexandre Grillat and Maxime Villota, Directors elected by the employees.

Mr. David Azéma was appointed by the Board of Directors on 22 November 2012 as a member of the Audit Committee, replacing Mr. Jean-Dominique Comolli.

The membership of the Company's Audit Committee reflects the specific characteristics of membership of the Board of Directors following the implementation of the law of 26 July 1983 relating to the democratisation of the public sector, which makes it difficult to comply with a proportion of two-thirds independent Directors on the committee, as recommended by the AFEP-MEDEF Code. However, the Company considers that, although the Audit Committee does not have two-thirds independent Directors, its current membership does not affect the skills of the committee or its ability to effectively fulfil the duties entrusted to it by law and the Board's internal rules of procedure.

The Chairman and Chief Executive Officer attends the committee meetings intended to examine the annual and half-yearly financial statements, the medium-term plan and the budget.

The Audit Committee met 7 times in 2012. The average attendance rate for its members was 85.7%.

#### Duties

The committee reviews and gives its opinion, before examination by the Board, on:

- the Company's financial position;
- the medium-term plan and the budget;
- the preliminary financial reports prepared by the Corporate Finance Division (Company financial statements and the Group's consolidated financial statements and management report);

- the monitoring of the Company's risks (specifically, the review every six months of the Group's risk mapping and risk management methods);
- audit and internal control: organisation, deployment and evaluation of the system of internal controls, semi-annual audit programs, main findings and the resulting corrective actions, monitoring of their implementation, as well as the draft annual report by the Chairman of the Board of Directors on corporate governance, internal control and risk management procedures;
- the insurance strategy;
- the choice of Statutory Auditors, ensuring their independence, and the fees paid to them;
- the financial aspects of external growth or disposal activities that are particularly significant (see section 16.2.1.5 ("Powers and duties of the Board of Directors") above).

For the purposes of its work, the committee regularly meets with the Statutory Auditors, Executive Management, the Corporate Finance Division and the Group Audit and Risk Management Director.

#### Activity in 2012

In 2012, the Audit Committee reviewed the items that fell specifically within its duties (semi-annual and annual financial statements, related press releases, quarterly revenue statements, risk mapping, summary of internal audits and audit program). It also examined the impact of taking control of Edison on the Group's financial statements.

### 16.2.3.2 Nuclear Commitments Monitoring Committee

#### Functioning and members

The Nuclear Commitments Monitoring Committee (NCMC) is chaired by Mr. Philippe Crouzet, an independent Director appointed by the Shareholders' Meeting and an individual outside the Group. The other members of the committee are Mrs. Marie-Christine Lepetit and Mr. Yannick d'Escatha, Directors representing the French State, as well as Mrs. Marie-Hélène Meyling and Mr. Maxime Villota, Directors elected by the employees.

Mrs. Marie-Christine Lepetit was appointed by the Board of Directors on 24 May 2012 as member of the Nuclear Commitments Monitoring Committee, replacing Mr. Pierre-Marie Abadie.

The Nuclear Commitments Monitoring Committee met 3 times in 2012. The average attendance rate for its members was 86.7%.

#### Duties

The Nuclear Commitments Monitoring Committee is tasked with monitoring changes in nuclear provisions, issuing an opinion on issues relating to governance of dedicated assets, the rules for asset-liability matching and on strategic allocation, and ensuring the compliance of the management of the assets implemented by EDF in accordance with the policy for constituting and managing the dedicated assets. For this purpose, it may be supported by the Nuclear Commitments Financial Expertise Committee which is comprised of six<sup>1</sup> independent experts, whose duty it is to assist the Company and its corporate bodies in such matters.

#### Activity in 2012

In 2012, the committee specifically reviewed the framework of the policy for constituting and managing dedicated assets, the state of progress of the plan for the storage of long-life medium- and high-activity waste, the 2012 update letter of the second three-yearly report on the securing of the financing of nuclear expenses as well as the report by the National Commission for the Evaluation of the financing of expenses for dismantling basic nuclear facilities and management of used fuel and radioactive waste.

1. Appointed on 26 October 2010 by the Board of Directors for 3 years.



### 16.2.3.3 Strategy Committee

#### Functioning and members

The Strategy Committee is chaired by Mr. Henri Proglio, Chairman and Chief Executive Officer. The other members of the committee are Mr. Michael Jay, an independent Director appointed by the Shareholders' Meeting and an individual outside the EDF group, Mrs. Marie-Christine Lepetit and Messrs. David Azéma and Pierre Sellal, Directors representing the French State, as well as Mrs. Marie-Hélène Meyling and Messrs. Alexandre Grillat and Jean-Paul Rignac, Directors elected by the employees.

Mrs. Marie-Christine Lepetit was appointed member of the Strategy Committee by the Board of Directors on 24 May 2012, replacing Mr. Pierre-Marie Abadie.

Mr. David Azéma was appointed member of the Strategy Committee by the Board of Directors on 22 November 2012, replacing Mr. Jean-Dominique Comolli.

Since 2010, the Chairman has invited non-member Directors to meetings of the Strategy Committee, in order to increase the involvement of the Board of Directors in the strategic discussion.

The Strategy Committee met 5 times in 2012. The average attendance rate for its members was 90%.

#### Duties

The Strategy Committee issues an opinion to the Board of Directors on the Company's major strategic decisions and, specifically, the strategic referencing system, industrial and commercial policy, the public service contract, strategic agreements, alliances and partnerships, research and development policy, and internal and external growth or disposals projects requiring approval from the Board of Directors.

#### Activity in 2012

In 2012, the committee specifically reviewed the impact of additional safety inspections on EDF and EDF Energy's nuclear fleets, the Group's strategy in terms of renewable energy as well as, at a joint meeting with the Ethics Committee, the Group's human resources policy and EDF's policy in terms of equal access to employment and equal pay.

### 16.2.3.4 Ethics Committee

#### Functioning and members

The Ethics Committee is chaired by Mrs. Mireille Faugère, an independent Director appointed by the Shareholders' Meeting and an individual outside the EDF group. The other members of the committee are Mrs. Marie-Christine Lepetit, Director representing the French State, Mrs. Christine Chabauty and Mrs. Marie-Hélène Meyling as well as Messrs. Alexandre Grillat and Philippe Maïssa, Directors elected by the employees.

Mrs. Marie-Christine Lepetit was appointed member of the Ethics Committee by the Board of Directors on 24 May 2012, replacing Mr. Pierre-Marie Abadie.

The Ethics Committee met 9 times in 2012. The average attendance rate for its members was 81.1%.

#### Duties

The Ethics Committee ensures that ethical considerations are taken into account in the work of the Board of Directors and in the management of the Company. It reviews the reports from the Mediator, the Inspector General for nuclear safety and radiation protection, the Inspector for hydropower safety and the General Inspector for the regulated sector governance.

Moreover, each year the Ethics Committee conducts an assessment of the running of the Board and its committees, and every three years oversees a

formal assessment of the work of the Board and its committees entrusted to an external consultant (see section 16.2.1.7 ("Assessment of the functioning of the Board of Directors") above).

In addition, the committee regularly visits operating sites in order to understand the issues involved in its duties.

#### Activity in 2012

In 2012, the Ethics Committee specifically reviewed the Group's draft Ethical Charter, the Group's health and safety policy, the Group's communication and sponsorship policies as well as, at a joint meeting with the Strategy Committee, the Group's human resources policy and EDF's equal access to employment and equal pay policy.

### 16.2.3.5 Nominations and Compensation Committee

#### Functioning and members

Under the rules of procedure, the Nominations and Compensation Committee is chaired by Mr. Bruno Lafont, an independent Director appointed by the Shareholders' Meeting and an individual outside the EDF group. The other members of the committee are Mr. Michael Jay, an independent Director appointed by the Shareholders' Meeting and an individual outside the EDF group, and Mr. David Azéma, a Director representing the French State.

Mr. David Azéma was appointed member of the Nominations and Compensation Committee by the Board of Directors on 22 November 2012, replacing Mr. Jean-Dominique Comolli.

The Nominations and Compensation Committee met 3 times in 2012. The average attendance rate for its members was 88.9%.

#### Duties

In accordance with the rules of procedure of the Board of Directors, the Nominations and Compensation Committee submits proposals to the Board of Directors regarding the appointment of Directors by the Shareholders' Meeting. It submits for approval, to the Minister for the Economy and the Minister for Energy, an opinion on the compensation of the Chairman and Chief Executive Officer regarding the salary, variable portion (including the criteria for the setting of the variable portion and assessment of the results achieved based on the objectives set) and peripheral compensation of the Chairman and Chief Executive Officer. It also submits this opinion to the Board of Directors for deliberation and the setting of this compensation.

If necessary, it discusses the salaries of the Chief Operating Officers and issues an opinion on the compensation proposals that the Chairman and Chief Executive Officer submits regarding the salary, variable portion and peripheral remuneration of each Chief Operating Officer. It submits its proposals and its opinion for approval to the Minister for the Economy and the Minister for Energy, and also submits it to the Board of Directors for deliberation and setting of this compensation.

The committee submits to the Board of Directors its opinion on the conditions for the setting of the compensation of the principal managers (fixed and variable portions, calculation method and indexing), as well as the amount and terms and conditions for the distribution of the Directors' fees. It ensures the existence of succession plan charts for Executive Committee positions.

#### Activity in 2012

In 2012, the committee specifically reviewed the variable portion of the compensation of the Chairman and Chief Executive Officer for 2011, as well as his gross fixed annual compensation and the criteria for calculating his variable compensation for 2012. It also examined the policy for the compensation of EDF group managers.

## 16.3 Bodies created by Executive Management

The Chairman and Chief Executive Officer chose to surround himself with an Executive Committee within which all the Group's lines of business are represented, as are finance, legal affairs and human resources.

This committee is a body enabling study, strategic discussion and cooperation in the Group's cross-disciplinary activities. It examines all the Group's significant underlying and current issues, tracks the operating objectives and results and contributes to the management and forecasting of the EDF group's major challenges. It reviews and authorises significant projects, specifically the Group's investment or divestment projects for amounts which exceed certain thresholds. The Executive Committee meets each week.

To further strengthen the examination and monitoring of projects, a Commitments Committee under the Executive Committee was created by the Chairman and Chief Executive Officer, which conducts an in-depth review

of projects being positively considered by the Executive Committee before the Executive Committee makes a final decision. No investment project by the Company may be proposed for review by the Board of Directors without having first been approved by this committee.

On the date of filing of this reference document, the Executive Committee had eight members and a Secretary. The list of members and their personal information appears in section 14.2 ("Executive Committee").

The organisation of the Executive Management is supplemented by a Management Committee comprised of the members of the Executive Committee, as well as the Group's senior international executives and managers of the geographic regions, as well as the Company's administrative officers.

## 16.4 Ethical approach

EDF's ethical approach, presented to the Board of Directors on 26 March 2003 and coordinated by the Ethics and Compliance Officer, consists of distributing and applying a code of conduct, the Ethics Guide, based on five values: respect for individuals, environmental responsibility, a quest for performance, commitment to solidarity and demand for integrity.

The Ethics Guide develops the Group's ethical commitments towards stakeholders as well as those expected of employees. EDF's ethical values are the basis for the company's corporate, "societal" and environmental commitments, particularly its adherence to the UN Global Compact, its reference to fundamental international commitments, as well as the international EDF Corporate Social Responsibility Agreement. The approach is applied by management to all the Group's Divisions and companies.

An ethical whistleblower procedure was launched in January 2004, making it possible to question the Ethics Officer on any issue, warning or complaint of an ethical nature, through secure e-mail.

In October 2011, a new Group Ethics Guide was ratified by the Group Management Committee following work with each of EDF's subsidiaries. This draft was examined twice by the Ethics Committee then submitted to the Board of Directors on 22 November 2012. This code is translated into the languages of each relevant country and is currently being rolled out Group-wide (see section 4.2.5 ("Ethics and oversight")).

## 16.5 Stock Exchange Ethics Code

In 2006, the EDF group adopted a set of principles and rules applicable to trades in shares in EDF or listed EDF group subsidiaries. These rules were combined into an Ethics Code, updated in March 2011, in order to take account of the AMF recommendations of November 2010 and presented to EDF's Executive Committee on 4 April 2011. At the same time as this Charter was distributed, awareness campaigns on stock exchange rules were launched for Group employees, specifically regarding precautions and obligations relating to the holding of inside information and the black-out

periods during which permanent insiders and Group staff with precise knowledge of the Company's financial statements prior to publication are required to abstain from trading Company securities.

The code also notes the obligations imposed on executives to declare to the AMF and to the Company trades in EDF securities (see section 17.7 ("Shareholding by Directors and trading of EDF securities by corporate officers and executives")).

## 16.6 Report prepared by the Chairman of the Board of Directors in accordance with article L. 225-37 of the French Commercial Code

In accordance with the provisions of article L. 225-37 of the French Commercial Code, the Chairman of the Board of Directors must describe, in a report attached to the management report, the members, conditions of preparation and organisation of the work of the Board, as well as the internal control and risk management procedures implemented by the Company. This report is provided in Appendix A of this reference document.

The Statutory Auditors' report, prepared in accordance with the final paragraph of article L. 225-235 of the French Commercial Code, on the report prepared by the Chairman of the Board of Directors of EDF, regarding the internal control procedures for the preparation and treatment of accounting and financial information, is provided in Appendix B.



# 17 Employees - Human Resources

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As well as relying on the company's history and DNA, the EDF group's social vision and Human Resources ("HR") policy must be developed, as part of a long-term strategy to improve the Group's industrial and economic performance.

The strategic challenges faced by the Group saw it engage in wide-ranging discussions to determine the human goals and employer model that the EDF group wanted to embody by 2020. These discussions extended over the whole first half of 2012 and featured employees, managers and the HR department.

This innovative development approach culminated in the publication of the "2020 HR Vision", setting out EDF's human goals, in addition to the industrial, financial and commercial components of the Group's strategy.

These reaffirmed human goals are currently being deployed Group-wide, focusing on the four major factors that contribute to achieving them:

- men and women playing a key role in the Group's performance;
- being a benchmark employer in terms of employee commitment and social performance;
- having both a strong local presence and an international profile;
- managing change smoothly and accountably.

RTE, which was previously fully consolidated in EDF's consolidated financial statements, has been, since 31 December 2010, consolidated by the equity method following the changes made to the company's governance (see section 6.2.2.1 ("Transport – RTE")). Therefore, unless otherwise stated, the data and information included in this section does not include data on RTE.

## 17.1 Skill development

### 17.1.1 Group workforce

The EDF group's consolidated workforce totalled 159,740 staff on 31 December 2012, including 107,333 for EDF and ERDF and 52,407 for the Group's other subsidiaries and shareholdings, which are included in the consolidation scope.

The table, below, shows the changes in the workforces for each of the Group's subsidiaries and shareholdings, weighted by the financial consolidation percentage over the last three fiscal years:

	2010 <sup>(2)</sup>		2011 <sup>(3)</sup>		2012	
	Number	%	Number	%	Number	%
EDF and ERDF <sup>(1)</sup>	96,571	64.4	103,954	66.6	107,333	67.2
Subsidiaries (France and international)	53,449	35.6	52,214	33.4	52,407	32.8
<b>GROUP TOTAL</b>	<b>150,020</b>	<b>100</b>	<b>156,168</b>	<b>100</b>	<b>159,740</b>	<b>100</b>

(1) The workforces of EDF and ERDF include employees not employed under EGI status by EDF and ERDF. ERDF's workforces include, in addition to its own employees, those whose services are shared, including 100% electricity employees (34,324), and a proportion of employees assigned to combined gas and electricity activities (3,887), divided between electricity/gas on an approx. 75/25 basis.

(2) Excluding RTE (N.B. RTE's workforce in 2009 8,809 employees; in 2010 8,822 employees; in 2011, RTE had approximately 8,779 employees; in 2012, RTE had approximately 8,843 employees).

(3) Since 2011, the workforces included occupational physicians, staff employed as part of various social measures (apprentices, professional training contracts) as well as staff seconded to external bodies (AMADOE), i.e. on 31 December 2012, 3,962 EDF staff and 2,429 ERDF staff. (In 2011, 3,574 staff for EDF and 1,955 staff for ERDF on 31 December 2011).

### Group workforce in France

For the Group's two principal companies (EDF and ERDF), overall workforces stabilised in 2010, following a down-turn since the start of the 90s. From 2011, workforces began to grow significantly and this trend gathered pace in

2012. This increase in staff numbers was supported by a high level of hiring, far exceeding the number of retirements; with more than 6,500 recruitments and 3,500 retirements, EDF and ERDF recruited more than 3,000 net staff.



The table, below, shows the breakdown of Group employees in France (Group share for the subsidiaries in France) during the last three fiscal years:

	2010	2011 <sup>(1)</sup>	2012 <sup>(1)</sup>
<b>EDF – deregulated sector:</b>	<b>62,201</b>	<b>67,184</b>	<b>69,122</b>
Generation and Engineering	35,173	36,569	38,417
Trade	11,627	11,633	11,685
Corporate	11,590	11,624	11,559
Island Energy Systems	3,224	3,183	3,177
CDI (open ended contract) and CDD (temporary contract) not employed under EGI status	587	4,175	4,284
<b>ERDF – regulated sector</b>	<b>34,370</b>	<b>36,770</b>	<b>38,211</b>
<b>Other subsidiaries in France:</b>	<b>23,710</b>	<b>23,312</b>	<b>21,995</b>
Électricité de Strasbourg, Tiru, EDF EN, SOCODEI, Fahrenheit, EDF PEI (in 2011 and 2012), EDF Optimal Solutions (only in 2012)	6,134	5,331	6,031
Dalkia International	17,576	17,981	15,964
<b>TOTAL FRANCE</b>	<b>120,281</b>	<b>127,266</b>	<b>129,328</b>

(1) Since 2011, the workforces for 2012 included occupational physicians, staff employed as part of various social measures (apprentices, professional training contracts) as well as staff seconded to external bodies (AMADOE), i.e. on 31 December 2012, 3,962 EDF staff and 2,429 ERDF staff.

## International Group workforces (consolidated subsidiaries)

The table, below, shows the breakdown of the workforces (Group share) in the international subsidiaries and shareholdings included in the consolidation scope during the last three fiscal years:

	2010	2011	2012
<b>EDF Energy (United Kingdom)</b>	<b>15,441</b>	<b>15,536</b>	<b>15,153</b>
<b>EDF Trading (United Kingdom)</b>	<b>888</b>	<b>904</b>	<b>1,025</b>
<b>Edison (Italy) <sup>(1)</sup></b>	<b>1,929</b>	<b>1,843</b>	<b>3,248</b>
<b>Other foreign subsidiaries:</b>	<b>11,481</b>	<b>10,619</b>	<b>10,986</b>
<i>Eastern Europe</i>	6,421	5,606	6,015
<i>Western Europe and Mediterranean Europe and Africa</i>	3,553	3,518	3,450
<i>Asia Pacific</i>	76	75	75
<i>Americas</i>	1,431	1,420	1,446
<b>INTERNATIONAL TOTAL</b>	<b>29,739</b>	<b>28,902</b>	<b>30,412</b>

(1) Edison has been 100% consolidated since 1 June 2012.

### 17.1.2 Training and mobility policy

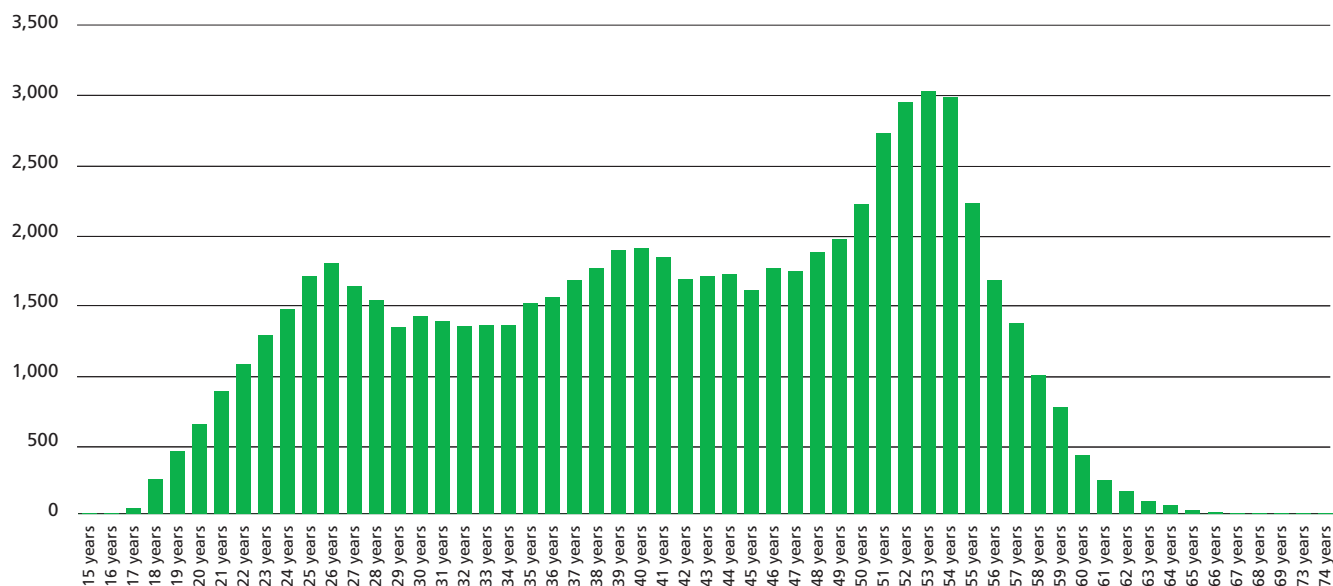
The EDF group is now facing new challenges:

- the lines of business are evolving, together with the technological, economic and environmental challenges in the energy sector, and with the growth ambitions of the EDF group in France and abroad;
- the resumption of industrial investments in all business lines and the development of the Group's activities internationally are intensifying the need for skills;

- more than 16% of the EDF and ERDF workforce could retire between 2013 and 2016, including a significant proportion of the maintenance and operating staff in generation, engineering and distribution activities.

EDF and ERDF are taking steps to meet this challenge: by significantly increasing its recruitments, which should continue over the next 5 years in order to face up to the high number of retirements; with the creation of 13 Skills Academies, which focus closely on the Group's major lines of business (nuclear, thermal and hydraulic generation, nuclear engineering, trading and upstream-downstream optimisation, electricity distribution, etc.).

The graph, below, presents EDF's age structure on 31 December 2012:



## Recruitment and mobility

Recruitment and mobility within the Group are crucial factors to help the renewal of these skills and support the Group's development projects in France and internationally. In 2011, the site [edfjoinus.com](http://edfjoinus.com) began publishing offers from EDF Energy (United Kingdom) and in 2012 offers from EDF Luminus (Belgium) and will soon begin publishing offers from Edison (Italy).

In spite of a highly competitive labour market, EDF and ERDF recruited more than 6,500 employees in 2012.

These recruitments include all the Group's main lines of business, principally generation (see the "Recruitment in the nuclear sector" table, below) and electricity distribution, but also trading and R&D. The three categories (managers, supervisory staff and operating staff) recruit in practically equal proportions. The newly-hired employees are above all young graduates, but EDF also recruits more experienced staff.

## Recruitment in the nuclear sector

EDF/France	2010	2011	2012
Nuclear Generation Division	1,294	1,082	1,570
Nuclear Engineering Division	398	455	485
Nuclear Fuel Division	11	20	23
<b>TOTAL</b>	<b>1,703</b>	<b>1,557</b>	<b>2,078</b>

Including the above recruitments in France, more than 12,500 new employees joined the Group worldwide.

In terms of mobility, EDF and ERDF put in place the following schemes promoting career development for employees:

- an intranet site was launched at the start of 2011 to make it easier for employees to access information on career paths and information on EDF, ERDF and RTE;
- job and employee skills offers have been displayed since 2007 in an Employment-Mobility Information System, which is used to inform recruiters of skills offers (mobile employee career plans) and let employees know about offers for positions available in the short- or medium-term. At the end of December 2012, 777 calls for expertise were online (up 0.3% on the end of 2011) and 1,043 job offers were proposed (down 8% on 2011);
- throughout their entire careers, employees can be assisted with developing their career plans: career advisors are available to managers

and their employees. The number of these advisors increases year on year, and has now become a genuine line of business, which will soon be professionalised at Group level;

- in addition, the coordination of regional mobility is a crucial component to support the success of the Group's plans and employees' plans: approximately three quarters of mobility is regional. Seven Regional Employment Directors head up committees featuring the HR managers in charge of regional mobility and organise careers fairs: employees are regularly invited to them to discover the company's lines of business and the positions available in the short- and medium-term.

Finally, the implementation of an international mobility policy makes it possible to mobilise the skills necessary for the projects developed in thirty or so countries. A special international extranet site accessible to all group employees allows both employees who want to work internationally to be seen by recruiters and recruiters to pinpoint candidates on top of the short lists drawn up from each line of business.

## Training

The Group, which operates in highly-technical lines of business, has always ranked employee training amongst its top priorities.

In France, the "Training Challenge" agreement signed on 10 September 2010 by all EDF, ERDF and RTE's union organizations also gives a new dynamism to the Group's training policy.

13 Skills Academies are coordinated by each line of business and organised into a network, the objective being to aim for a high level of operational and technical expertise and take account of the challenges of each line of business in the training courses as well as possible. The Academies specifically cover each of the Group's principal professional groups: technical positions and support positions. These Skills Academies all received seals of approval in 2011 and were certified by a jury of leading experts (including non-EDF experts) specialising in the area covered by the training course. The confirmation of these seals of approval are underway in 2012.

Every employee changing category now receives systematic assistance through a new specific scheme introduced in order to simplify the taking of responsibility and internal professional mobility. In 2012, 694 employees promoted to management positions and 497 employees promoted to supervisory positions were respectively able to benefit from these schemes.

Every employee can also attend qualifying promotional training courses, if they have the motivation and potential: they are genuine career accelerators and allow employees access to positions with greater responsibility and therefore to progress professionally. New long qualifying training schemes, principally based on employee recommendations, were added to the existing courses. They make it possible to progress more rapidly to a new category. After an experimental phase in 2011, a new scheme, *Cap Initiative Cadre*, was rolled out group-wide in 2012 and another, *Cap Initiative Maîtrise*, launched on an experimental basis.

In total, 360 promotion offers were published in 2012 for the whole group, including 214 "management" offers and 146 "supervisory" offers. The publication of these promotion offers was up 57% on 2011.

The group's managers in France benefited from this increased training effort via the courses proposed by the Group Management University. Three training courses help them to take responsibility: 741 of them attended these courses in 2011 and 1,294 in 2012. The Group's Management University organised 40 courses including 87 modules. The "on campus" offer for current managers shall be fully rolled out by late 2013.

More than 11,000 managers in France and abroad have access to a distance training platform, where they can complete online e-learning modules to receive basic professional management training: annual review, delegation, staff development and time management. These training schemes were deployed from 2012 in Polish for Polish managers and in English for Hungarian and Slovakian managers. Access for Chinese managers will arrive in 2013, as well as for Belgian, Italian and English managers.

The e-learning platform recorded 25,604 logins from launch to the end of December 2012. 6,548 managers and executives logged in at least once to ecampusmanagers and there were 2,744 hours of distance learning.

Finally, the Group's Management University continued in 2012 its internationalisation via an introductory session on the Group and its challenges for managers, talents and new arrivals from the Chinese Division and a training session for managers in Belgium and Poland.

The Training Challenge agreement is gradually being extended to the Group's companies worldwide, specifically through the internationalisation of certain Skills Academies (law, HR), the scheduled opening of a Campus in the United Kingdom or even the People Development Programme. Since 2012, this programme aims to implement, in all the Group's companies worldwide, six commitments to employees focusing on:

- the annual review, which should specifically include a performance section and a career development section;
- support from a HR representative during the key stages of their career;
- access to appropriate training programmes in order to be able to receive professional training for their current and future employment;
- visibility regarding job and mobility opportunities within their company/ country and the Group/worldwide;
- information on changes to their line of business in order to be able to think ahead;
- the transfer of skills to young people and new recruits (work-study programs, placements, etc.).

Accordingly, most of the Group's companies put in place an annual assessment and performance review. E-learning modules were specifically developed in France for managers, sometimes for employees in order to prepare this annual milestone. The annual review forms were improved with a development-professional training section and a career path section (currently being deployed).

In terms of training, the companies have begun to systematically identify employees who haven't received any training for at least 3 years and to implement corrective measures, if necessary.

The training centres are developing through a network of new and existing Campuses:

- a "flagship" campus for the entire EDF group, currently based in Les Mureaux and then from 2015 in Saclay;
- "skills" campuses focusing on generation, and distribution of electricity, consisting of 35 sites spread throughout the whole of France;
- one campus currently under construction in the United Kingdom, on the Cannington/Bridgewater site, will open progressively in 2013.

The Group's financial investment in training reflects this level of commitment.

	2012	2011
<b>Group</b>		
% of the payroll allocated for training	7.3	7.0
Average number of training hours per employee trained	58	62
<b>France</b>		
% of the payroll allocated for training	8	7.5
Average number of training hours per employee trained	61	64

Throughout EDF, the level of access to training, like the amount of training per employee, is high: 85.2% of employees attended at least one training course in 2012, lasting an average of 78 hours.

## 17.2 Equal opportunity

### 17.2.1 Work-study programs

An excellent path for training, professionalization and occupational integration for young people and individuals experiencing difficulties finding employment, the work-study program is a key element of EDF's identity.

In the "Training Challenge" agreement, EDF, ERDF and RTE made eight commitments, including the following:

- over 4% of the Group's workforce in work-study programs at all levels of training: in 2012 over 3,600 trainees joined EDF and ERDF under apprenticeship or professional training agreements to prepare for all levels of degrees or professional qualifications, from vocational training certificates to Masters degrees, raising to nearly 5,700 the number of trainees on 31 December 2012, i.e., more than 5% of the Group's workforce. They are issued with a welcome booklet when they join to make their training easier;
- allocation of a significant number of positions to trainees trained by the Group in its hiring: in 2012, they accounted for 9.5% of management hirings and 24.9% of supervisory/operating staff hirings by EDF and ERDF;
- employment assistance for trainees that are not hired. In 2012, the Group signed an Agreement with the Pôle Emploi employment agency to take further steps and particularly agreed to: conduct a review with each departing trainee in order to learn his/her intentions at the end of the contract and to fine-tune over the same period the jobs available in each unit, send the Pôle Emploi employment agency a forecast of trainee numbers and qualification levels at the end of their contracts so that Pôle Emploi can match them to employment needs in each region, and to organise meetings organised by Pôle Emploi at the end of the contracts, including group and individual information sessions. In 2012, 632 trainees benefited from this scheme as part of the 69 workshops organised regionally;
- the extension of assistance measures directed towards trainees that are more favourable than required by regulation, such as supplemental health coverage.

Overall worldwide, the Group took on more than 6,700 work-study trainees in 2012.

The work-study program relies on the commitment of more than 4,000 tutors throughout EDF and ERDF, whose mission is to assist work-study trainees in their professional training on a daily basis. Leadership, training and experience-sharing schemes are organised for them.

An IPSOS survey conducted in 2012 made it possible to better identify their expectations. A working plan was drawn up following the survey and is currently being rolled out. The work-study program is also based on high-quality partnerships with several training organisations. These include an Apprentice Training Centre (*Centre de Formation des Apprentis - CFA*) dedicated to Energy Professions, which opened its doors in the Ile-de-France region in September 2011 on the initiative of EDF, ERDF and RTE. It opened in 2012 a new "Marketing Techniques" technical university diploma section.

### 17.2.2 Senior employees

In France, the Group continued the roll-out of the senior action plan submitted to the Central Works Council in December 2009. The number of employees aged 56 and over is increasing; they currently represent 9.5% of the workforce (8% in 2010 and 9% in 2011); employees aged 50 and over represent 32% of EDF's workforce (34% in 2010, 33% in 2011) and there are now more than 1,000 employees aged 60 and over (nearly 500 in 2010, a little over 800 in 2011).

The Group is committed to encouraging the continued employment of employees aged 55 and over, and to improving the working conditions of senior employees. This specifically means improving the presence of

senior employees, encouraging career advancement throughout their entire professional lives, with specific preparation for the second half of the career, provision of easier access to training for senior employees and better preparation for the transition from the end of professional activity to retirement.

Mid-career interviews are gradually being introduced: they are conducted by HR managers, in collaboration with managers, and are aimed at employees from all categories at around the age of 45.

An end-of-career interview is conducted by the manager as part of the annual review, at the earliest 5 years and no later than 2 years before the employee's pension eligibility date. The gradual implementation of this interview in all lines of business has been launched since the last quarter of 2011. These interviews were systematised in 2012 throughout EDF.

Since the end of 2010, approximately 210 HR managers have been trained to conduct mid-career interviews in order to enable the gradual implementation of these interviews for all relevant employees. At the end of 2012, more than 590 employees attended a half-day course on mid-career interviews, and more than 500 interviews have been conducted, meeting the aim set by EDF.

In France, the Group is preparing for the implementation in 2013 of the "Generational Contract" national industry-wide agreement signed on 19 October 2012, as soon as the decrees for the implementation of the law, scheduled for early 2013, are published. The negotiation of an agreement on the generational contract for the Group in France will highlight our policies for the employment of both young people and senior employees.

### 17.2.3 Diversity – non-discrimination

The EDF group is committed to promoting diversity as a way to improve performance in terms of:

- better understanding the diversity of clients and meeting their expectations as well as possible;
- better reflecting the society in which it operates;
- allowing women and men to express their talents to the best of their ability.

To do so, the company has made commitments on this issue on several occasions, starting in 2005 with the Group Social Responsibility Agreement, which devotes several articles to the fight against discrimination, respect for diversity and promoting equal opportunities. This, along with the Ethics Code, is the main frame of reference for the Group's companies. The level and formalisation of more specific commitments on a local basis vary depending on the applicable legal framework. For instance, EDF Demasz has had an equal opportunities action plan since 2010, whereas work by French companies has focused strongly on gender equality, disability and age diversity agreements. In November 2012, EDF Energy was also awarded the Diversity Works for London Gold Standard, in recognition of its work in favour of equality and diversity.

In 2012, a Group international diversity community was officially launched, whose mission shall be to both facilitate the implementation of measures in favour of diversity and share good practice.

The Chairman of EDF made a formal commitment to its employees, in a memo dated 1 June 2006, to promote diversity and equal opportunities and to prevent discrimination. This commitment, which was developed into action plans for each of EDF's business divisions, is currently being implemented and monitored via a special annual review.

### Manager and employee awareness to diversity issues

Since 2008, the EDF group, which signed the Diversity Charter on 22 September 2006, has organised a "Diversity Day" in May each year. This

event allows each of the Group's entities or subsidiaries to showcase the initiatives it has taken to promote diversity and prevent discrimination. In 2012, the company initiatives organised for Diversity Day involved around 40,000 employees. Several companies particularly chose 2012 as a time to promote diversity and gender equality.

In France, EDF's commitments on diversity have resulted in the creation of a training program for managers, HR managers and employees on the images and stereotypes linked to diversity. More than 7,000 staff have been trained in France since 2007. In addition, a training day for Group managers was introduced in 2012: four sessions have been organised to date. EDF Energy has also trained 400 managers.

In 2010, EDF won the Diversity Management Trophy for its innovative work in taking religion into account at work. After work in the field to identify the situations at work that raise issues, EDF was the first Group to introduce a "Religion at work" guidance tool for use by both line and HR managers.

Finally, in February 2012, EDF signed the company parenthood charter, by which the Group commits to developing parenthood-related representation within the company, creating an environment favourable to parent-employees, particularly pregnant women, and complying with the principle of non-discrimination in the professional development of parent-employees.

## Employment of disabled employees

In 2009, EDF and ERDF each signed a new agreement for the integration of disabled people covering the period 2009-2012. These agreements each include goals in terms of the recruitment of disabled people.

Accordingly, 124 disabled employees were recruited in 2012 by EDF and 66 by ERDF. Over the term of the agreements, EDF and ERDF accordingly recruited 635 disabled employees. In addition, both companies are leading a voluntary effort to take on young disabled people each year as part of work-study programs (trainee or professional training contracts): EDF and ERDF accordingly took on 79 disabled people on work-study programs in 2012.

Partnerships have been developed with associations in order to promote assistance for disabled people to make the transition from school to the world of work, such as Tremplin, Arpejeh<sup>1</sup> and FEDEEH<sup>2</sup> but also, in the field of technological research and innovation, for disabled employees.

In order to be able to welcome everyone in the best possible manner, EDF trains its advisors to welcome disabled clients and is continuing to convert certain boutiques, with the aim of providing accessibility for all. Accordingly, 49 boutiques have been converted (PRM access, audio-guide terminals and documents specially-adapted for visually-impaired people, online scheme for deaf people currently being tested where deaf or hard-of-hearing clients can be set up in front of a work station equipped with a webcam). This scheme was presented and recognised at the accessibility forum organised by the Paris police prefecture in September 2012.

In January 2012, a responsible sub-contracting agreement was signed by ERDF and all its social partners. It aims to increase ERDF's purchase volumes from companies that employ only disabled people and provide them with special facilities and support by 20% in three years.

Elsewhere in the Group (Edison, SSE, EDF Demasz, EDF Energy and EDF Polska), companies are also committed to facilitating the recruitment and fitting out of work stations for disabled employees. In 2012, Fenice signed an agreement on the employment of disabled people, including a commitment in terms of recruitment. Électricité de Strasbourg was recognised during the Tour de France of Diversity for its active commitment in favour of disabled people in its 2010/2012 agreement.

Disabled sports, which genuinely help to increase awareness within the company, found themselves particularly in the spotlight in 2012 as a result of EDF's support for the Olympic and Paralympic Games in London. Accordingly, paralympians are regularly invited along to specific events, in order to meet employees and managers.

## Gender equality

Equal access to employment for men and women is a key component of the Group's diversity policy.

After 2004 and 2007, the third EDF agreement on equal access to employment for men and women was signed on 8 February 2012 by the CGT, CFDT, CFE-CGC and FO unions. It commits signatories to six themes: permanent change in mentalities, diversity in employment and hiring, equality in career paths, equal opportunity for professional training, taking into account time and working conditions, and work-life balance. The signatories also committed to maintaining equal pay between men and women in terms of both main and performance-related pay, an objective met since 2010 (at the end of 2010 and the end of 2011, the differentials were 0.6% and 0.4% respectively in favour of men, as they have slightly higher average seniority; adjusted for seniority, there is no difference).

A new agreement was signed at ERDF by all the union organisations represented (CFDT, CFE-CGC, CGT and FO) on 30 November 2012.

EDF Énergies Nouvelles introduced an action plan aiming to promote diversity in all lines of business, to maintain equal pay for men and women with equivalent skills, particularly focused on working conditions.

Edison monitors indicators on the diversity of its workforces and the wage differential between men and women with equivalent responsibilities. They are published in its annual sustainable development report.

The Group also promotes diversity in each line of business by taking pre-recruitment measures. In 2012, EDF again backed the Fem Energia Prize, in partnership with the WIN (Women In Nuclear) association, which promotes and recognises the careers of young female students or women involved in the nuclear industry. EDF is continuing the partnership put in place in 2011 with the "Elles Bougent" association, which promotes technical and scientific careers for female secondary school pupils and students. 48 EDF "godmothers" volunteered to give occasional presentations at the meetings organised by "Elles Bougent". In 2012, EDF served as Honorary Chairman of this association. For its part, EDF Energy organises targeted recruitment campaigns to attract more young female engineers and trainees to its lines of business.

EDF is one of the rare major companies to have received the "equal access to employment" seal of approval in 2006, and again in 2008 and 2011. This seal of approval, created in 2005 at the initiative of the public authorities with social partners, is a sign of the exemplary nature of an organisation, of any legal structure, that is working effectively and continuously to achieve equal access to employment and professional gender diversity.

## Non-discrimination

As part of the scheme for the prevention of discriminatory practices put in place in 2009 by EDF after discussions with the union organisations, and whose roll-out shall be the subject of an annual review with the stakeholders, a framework for the prevention of discrimination was developed at the Group level in March 2010. It unites the companies around three principles, which are gradually implemented throughout each company. Accordingly, in 2011, initial reports were issued to the subsidiaries on the practical implementation of the principles of non-discrimination in HR practices and business.

1. An association working to "improve and promote the training, qualification and employment of disabled people".

2. Student federation working to improve conditions regarding the training and occupational integration of young disabled people.



Furthermore, the partnership put in place in late 2011 with the “L’Autre Cercle” association, which fights against discrimination based on sexual orientation and homophobia at work, enabled an initial assessment to be conducted and shared throughout EDF.

Promoting diversity also involves supporting schemes organised by employee networks. Accordingly, EDF Energy promotes its different networks, which are regularly highlighted in its internal memos: ethnic minority network, women’s network, disabled network, gay & lesbian network. These networks, which are particularly active, provided new opportunities for discussion and increasing awareness of these issues in 2012, with some of them also developing mentoring schemes.

In France, Energy has received financial and logistical support from EDF since 2012, as has the Interp’Elles women’s network, which opened a branch in Asia in 2012.

Finally, on 17 May 2012, an information pack on the fight against discrimination based on sexual orientation and homophobia was widely distributed throughout EDF and ERDF for the International Day against Homophobia, held on 17 May 2012.

## 17.3 Health and safety – quality of working life – sub-contracting

### 17.3.1 Health and safety policy

The Group operates in a high-technology, high-risk sector. The health and safety of its employees and its external service providers is therefore a major imperative for the Company.

EDF’s health and safety policy, signed by the Chairman in March 2009, takes into account developments in the professional environment, new types of work or even longer careers, which have given rise to new concerns requiring a reorientation of the policy. This new policy is the result of broad multidisciplinary dialogue among the various departments (management, experts, doctors, employee representatives). It reflects the values of respect for the individual, which it places at the heart of the organisations, and extends the common principles of health and safety defined in 2008 at Group level.

Since 2008, six common health and safety indicators have been shared by all of the Group’s companies. The results are the subject of a Group Committee report.

A Group-wide review of health and safety results is conducted annually by the EDF Executive Committee. The Human Resources Management Committee, comprised of EDF’s operational divisions, also conducts an annual review of EDF health at work policy in order to ensure its implementation, analyse the associated results indicators, check the effectiveness of the retained provisions and suggest improvements.

### Social dialogue and health at work

A collective agreement relating to social dialogue on health at work was signed in November 2010. In accordance with this agreement, 8 doctors were appointed by their peers to participate in the National Health at Work Group, created in 2011, which met 4 times in 2012.

This multidisciplinary group put in place 4 working groups devoted to reforming occupational medicine and its impact on the organisation of Workplace First Aiders, the health of service providers, addictive practices and the link between health and longer working life. The work of these groups will lead to the issuing of recommendations for the operational departments.

Furthermore, in accordance with the terms of the agreement, a meeting of all the secretaries of the Health, Safety & Working Conditions Committee was organised in February and December 2012. These meetings help to facilitate discussions about the running of the committee, pinpoint training requirements and discuss both legal issues and topical themes such as psychosocial risks in 2012. After a start-up phase, these meetings shall now be held on an annual basis.

In the Group’s companies, social dialogue on health and safety at work is covered by the legislation specific to each country.

In this area, French legislation gives priority to a specialist representative body, the Health, Safety & Working Conditions Committee, whose work involves monitoring, analysing information and proposing actions. The Group’s different French Divisions and companies use this body to present, amongst other things, both professional risk assessment documents and the occupational physicians’ annual reports. However, social dialogue in this field is also developed via other bodies.

In November 2011, the first meeting of the CWC (Central Works Council) was held, focusing exclusively on the issue of health and safety, practically implementing the multidisciplinary approach to health issues favoured by the company. This work continued in 2012. At Group-level, the preventive measures are presented annually to the European Works Council’s Health & Safety Committee.

### Occupational accidents

10 years of prevention and training efforts have made it possible to significantly reduce the number of accidents in the work place that result in absence from work at both EDF and the Group’s companies. The Group has recorded an improvement in the frequency rate (number of accidents at work having resulted in more than one day of absence from work, recorded over the current year and per million hours worked), which was 3.9 in 2011 and 4.5 in 2010 and in 2009. The 2012 result was 3.8, confirming this improvement.

EDF’s gravity ratio (number of days during the current year of sick leave related to accidents, including those resulting from accidents in previous years, per thousand hours worked) for 2012 was 0.15, compared to 0.14 in 2011 and 0.16 in 2010.

Having recorded an increase in the number of deadly accidents in the Group involving high falls in 2010 and 2011, EDF put in place in 2011 a scheme to share the causes of significant events throughout the Group. This scheme should make it possible to make progress in this field, specifically on the management of “core business” risks, such as the risk of high falls, electrical risks and road risks. Following the decision taken by the Chairman on 1 February 2012, any deadly accident must be immediately reported and analysed in-depth.

A fall in deadly accidents linked to “core business” was indeed recorded in 2012, but the number of deadly dizzy turns (10 at work and 2 while commuting) masks the reduction in the number of deaths, which fell from 27 in 2011 to 21 in 2012.

In terms of occupational diseases, the data published in the EDF SA Social Report in 2011 shows:

	2011	2010	2009
Number of occupational diseases declared to Social Security during the year (EDF)	11	12	12

These social security statistics are considered as consolidated after falling for 3 years.

The main conditions were due to silica (pneumoconiosis), asbestos (pleurisy, pleural plaques), asbestos (primary cancer of the lung), noise hazards (deafness), movements and positions (shoulder condition), movements and positions (tendinitis, carpal canal), conditions caused by ionising radiation. The number of employees affected by an occupational disease remained stable over 2010-2011 (approx. 50 employees).

## Asbestos

In the past, the EDF group has used products, materials and facilities containing asbestos. In accordance with current regulations, the replacement of materials containing asbestos in EDF establishments and facilities began in the late 1980s, with all materials containing asbestos being treated, and EDF set up reporting measures and procedures to protect employees and third parties working at the company.

In July 1998, EDF signed an agreement (revised in June 2002) with all trade union federations, for the prevention of and compensation for exposure to asbestos. Following this agreement, EDF introduced an early retirement plan for workers who are duly recognised as suffering from an occupational disease associated with asbestos, established voluntary financial assistance and a pension supplement both financed by EDF and provided social assistance to sick workers and their families with information and support during the compensation process.

See section 20.5 ("Legal proceedings and arbitration"), below, for a description of current procedures.

## 17.3.2 Quality of working life

Quality of working life is the result of the implementation of a set of vectors involving working organisation, working relationships, professional development, working environments and work-life balance. Promoting diversity and preventing discrimination also contribute to creating high-quality working conditions.

In order to go to the next level in taking account of all these vectors within the Group, in 2007, EDF created a "National Quality of Working Life Monitoring Organization", reinforcing its ethics plan and simplifying its procedures to encourage local management. The Monitoring Organisation is a forum for dialogue between doctors, managers, social partners and external experts. It monitors working conditions, orders studies and makes recommendations.

In 2008, it recommended the implementation of the EVREST (Changes and Relations in Health at Work) plan, which provides the company with a system of intersecting health/work indicators. This plan was implemented in 2009 by occupational physicians on a voluntary basis. In the electricity and gas industries, 107 doctors were registered and 87 had already filled in 9,000 questionnaires at the end of 2012 (4,808 at the end of 2011). The 2011-2012 results were presented at the Monitoring Organisation meeting in January 2013.

Since its creation, the Monitoring Organisation has issued other recommendations to promote work-life balance for employees and cooperation at work between generations. The implementation of these different recommendations made to management was assessed by management for the first time in 2011.

In 2011 and 2012, based on the work presented by the French National Agency for the Improvement of Working Conditions (ANACT – *Agence nationale pour l'amélioration des conditions de travail*) on the challenges

of the extension of working life, the Monitoring Organisation issued recommendations on the promotion of working environments encouraging professional development at all ages. It is currently looking into how change is managed by the company. Finally, an experimental cooperative "Innovation for better work" space enables managers and HR staff to promote and share good practice, receive expert advice and build an "Innovation for better work" community with more than eight hundred members.

At the Group level, the priority placed on improving quality of working life and health resulted in the implementation of exchanges of experience, comparison of data and observation of practices within lines of business or companies upon request. These exchanges were regularly organised within the "Health and Safety" community, covering health and safety at work, during the "learning expeditions" organised every year since 2010 in France, England and Poland.

Each entity has designated an ethics officer and a national toll-free telephone number is available for all employees in case of serious difficulties at work.

Since 2008, the support of specialist doctors has been available to management 24 hours a day, 7 days a week in case of a traumatic event in their unit, to advise them and organise all necessary assistance for the relatives of the victims and the work teams.

The "Preventing psychosocial risks and improving quality of working life" collective agreement signed in November 2010 by EDF provides for various multi-disciplinary dialogue projects closely focusing on situations at work and the training of participants.

The principal measures taken focused on:

- the widespread introduction of multidisciplinary groups and joint training of the participants in these groups;
- the listing of psychosocial risks in the unique document required by the regulations (a guide was published in order to take into account these risks in the assessment and list them);
- the gradual integration of QWL aspects into impact studies before the organisational changes are made;
- the mid-term assessment of the agreement with the signatories began in the second half of 2012.

Furthermore, EDF and ERDF developed multidisciplinary analysis groups (MAG) in each unit featuring a range of participants (managers, doctors, social workers, employee representatives, internal consultants) with the aim of sharing and presenting action plans regarding quality of working life and the prevention of psychosocial risks. There are currently more than 50 MAGs spread throughout EDF. Even at this early stage, the work of these groups can already be considered a success. They refresh the conditions for social dialogue by allowing wider-ranging discussions than with only social partners, making it possible to deal with individual and collective cases, in some cases playing a role in managing change and accordingly better linking health issues and economic performance.

In the Group's foreign subsidiaries, social dialogue is either based on direct implementation of the legislation or agreements between social partners. In Hungary (EDF Demasz), the law gives jurisdiction to a joint safety committee, which meets regularly to discuss safety issues, like in Italy (Fenice). In 2012, BEZrT and EDF Energy signed charters specifying the terms and conditions for social dialogue in terms of health and safety. At Edison, a specific agreement was signed in April 2012 on health and safety training, whose terms and conditions vary depending on the target audience (corporate, technical positions, mobile workers, management). A new health and safety policy was signed at SSE (Slovakia).

### Organisation and working hours

Since 1 October 1999, the duration of the working week in France has been 35 hours, with services available for a minimum of five days.

At the end of December 2012, 11.6% of EDF and ERDF's personnel opted for a collective or individual reduction in working hours with partial or zero compensation for salary loss. Group-wide, 9% of employees work part-time.

In addition, in order to ensure the continuous operation of EDF and ERDF's facilities or to re-establish electricity supply in the shortest time possible in the event of a technical failure, a portion of EDF's personnel provides a continuous service 365 days-a-year and another portion is on call outside of regular working hours.

### 17.3.3 Subcontracting

The EDF group's subcontracting policy focuses on three major themes:

- its first aim is for EDF to give its service providers medium-term visibility and select partner suppliers, taking account of the Group's industrial challenges and specifically the characteristics of its plant assets;
- EDF also wants to make progress in its subcontracting practices by benefiting from operational experience and the transfer of best subcontracting practices between lines of business;
- Finally, EDF has confirmed its commitment to the development of socially responsible subcontracting practices by signing or extending Agreements on Socially Responsible Subcontracting with union organisations.

The major areas in which EDF employed subcontracting in 2012 included both industrial and sales activities.

On the EPR reactor construction project in Flamanville, since the opening of the local branch of the Pôle Emploi employment agency at the end of 2007, 2,980 job offers have been published by companies and 95% of them have been filled.

Furthermore, at the end of December 2012, approximately 92,000 hours of training had been financed over the fiscal year, for local jobseekers, in order to enable them to apply for jobs offered by service providers working on the project, principally in the electro-mechanical sector.

This project employed up to 3,000 sub-contracted employees at any one time. The workforce was around 2,650 service provider employees over the final quarter of 2012. Since 2012, the number of civil engineering jobs has

fallen. These employees are assisted via the implementation of the action plans based on the Employment and Skill Development Commitment framework agreement (EDEC - Engagement de Développement de l'Emploi et des Compétences) signed in 2010. For example, 75 training courses were financed on this basis.

Subcontracted activities in the field of operational generation fleet maintenance specifically include cutting-edge or rare skills, which may only be offered and maintained on a constant basis by specialist firms which also work for other companies.

The highly seasonal variations in stoppages of generation facilities and, accordingly, the need to absorb peaks in demand also lead to a certain amount of use of subcontracting.

Finally, EDF uses subcontracting in order to benefit from specialist labour.

Use of subcontracting is therefore part of an industrial policy aiming to permanently guarantee the best possible performance in all sectors, both in terms of skills and organisation.

More particularly in terms of the operational nuclear generation fleet, after the publication in September 2011 of the Additional Safety Assessments drawn up following the Fukushima accident, 2012 was marked by the preparation by the Nuclear Industry Strategy Committee of the "social specifications" applicable to services provided and work carried out on a Basic Nuclear Facility in France. These social specifications, which apply to all nuclear operators, shall be included in EDF's calls for tenders from early 2013.

Furthermore, from 1 July 2012, EDF limited the number of levels of subcontracting for these same nuclear maintenance activities: each successful bidder is itself only allowed two levels of sub-contracting, including for ongoing contracts.

Customer relations activities also require use of subcontracting, in order to manage the extended hours proposed to clients and variations in workload. Preferably, this involves work that is less complex or less important for the client. It is also used on an overflow basis to absorb excess activity generated by conversion projects, particularly involving Information Systems.

On the theme of Socially Responsible Subcontracting (SRS), EDF has continued its work in collaboration with the union organisations that signed the SRS agreement.

Different operational issues were explored or implemented in 2012: e.g. EDF's Commerce Division was awarded the Socially Responsible seal of approval as instructing party for sub-contracted call-handling activities.

## 17.4 Global compensation policy

In order to attract, encourage and retain the skills that will allow the Group to face its industrial and commercial challenges, EDF is developing a global compensation policy that brings the company into line with the best practices observed in comparable sectors.

This global compensation policy covers:

- the recognition of the level of responsibility and results achieved through the wage policy;

- the recognition of collective performance through profit-sharing;
- the employee savings scheme and the company's contribution to these savings;
- employee shareholding; and
- social benefits.

## 17.4.1 Entry-level compensation policy

On 1 January 2012, the entry-level salaries for EDF employees with EGI status were as follows (13 months gross - cost-of-living allowance 25% - without professional experience):

	CAP/BEP (vocational training certificate taken at secondary school / school-leaving diploma)	Baccalauréat (A-levels / high-school diploma)	Bac +2 / BTS (Second-year university level -vocational training certificate at end of 2-year higher education course)	Management
Annual salary	20,296 € (19,153 € without diploma)	21,111 €	24,791 €	between 34,755 € and 42,204 €

The entry-level annual salary with qualifications equivalent to CAP/BEP at EDF is therefore 19% higher than the French national minimum wage (12-month minimum wage: 17,708 euros gross on 1 January 2012).

Since 2008, EDF has offered each of its employees a full individual review of their annual compensation and its components. Employees savings scheme leaflets were also distributed to all EDF and ERDF employees.

## 17.4.2 Salary policy

Salary policy is aimed at equitably recognising the contribution of each individual to EDF's success.

For managers, fixed annual compensation is supplemented by a variable portion based on individual performance. Since 2011, all EDF's staff in the Labourers, Employees, Technicians and Supervisors category have also received individual variable compensation, based on their individual and collective performances.

Most employees are eligible for variable compensation.

In 2012, for EDF and ERDF, the average annual gross salary was 39.5 k euros (based on 13 months) and 25.5 k euros for operating staff, 33.8 for supervisors and 56.3 k euros for management (compared to 25.5 euros, 33.3 k euros and 55.5 k euros respectively in 2011).

## 17.4.3 Profit-sharing and shareholding

In France, EDF has had a profit-sharing scheme for its employees for more than 20 years. Employees can choose either to receive payment and/or to invest it into either the Group Corporate Savings Plan or the Group Collective Retirement Saving Plan.

Following its conversion to a subsidiary, ERDF has also negotiated its own profit-sharing agreement. Similar measures exist among most of the Group's European subsidiaries.

The EDF and ERDF profit-sharing agreements are three-yearly and state that the profit-sharing amount to be paid shall be set based on the meeting of national objectives reflecting the different components of the companies' performances (economic, businesses, social and environmental). For EDF, the agreement signed on 30 June 2011 for the period 2011-2013 included five national performance criteria: Group EBITDA, power generation, customer satisfaction rate, employee training rate and reprocessed waste percentage.

In 2012, these agreements allowed the payment of €181.8 million to employees of EDF and ERDF for the 2011 fiscal year.

EDF and ERDF are not eligible for the shareholding scheme.

## 17.4.4 Group Corporate Savings Plan

The Group Corporate Savings Plan is open to employees of EDF and of the Group's French companies in which EDF owns directly or indirectly at least 40% of the share capital and which have signed up for the Group Corporate Savings Plan.

Six varied mutual funds, including a socially-responsible investment fund, a solidarity mutual fund and the "EDF Share" fund, are open to subscriptions. In 2009, employees were able to subscribe to the bond issue launched by EDF via the 2014 Bond Fund created for this purpose.

The EDF group Corporate Savings Plan totalled 3.6 billion euros at the end of 2012.

Profit-sharing, as well as individual payments and transfers from the Time Savings Accounts that employees make to the Group Corporate Savings Plan, are matched by the company under conditions negotiated within each company.

In 2011, the total gross amount contributed to the Group Corporate Savings Plan by EDF and ERDF was €106.3 million.

## 17.4.5 Collective Retirement Savings Plan

The EDF group Collective Retirement Savings Plan is open to employees of EDF and the Group's French companies in which EDF owns directly or indirectly at least 40% of the share capital and which have signed up for the Group Collective Retirement Savings Plan.

Two mutual investment funds are offered to employees: a collective mutual fund and the "Cap Horizons" umbrella fund, offering targeted management of the savings invested depending on retirement age.

The Collective Retirement Savings Plan totalled approximately €291.6 million for EDF and ERDF at the end of 2012. Profit-sharing, as well as individual payments and transfers from the Time Savings Account that employees make to the Collective Retirement Savings Plan, are matched by the company under conditions negotiated within each company.

For 2012, the total gross amount paid by EDF and ERDF to the Collective Retirement Savings Plan was approximately €31.2 million.

## 17.4.6 Time Savings Account

Time Savings Account agreements have been signed within the Group's principal French companies, specifically EDF and ERDF.

On 31 December 2012, the total number of hours saved in the time savings account by employees of EDF and ERDF was €575.3 million.

## 17.4.7 Employee shareholding

At the time of the Company's public offering in the framework of the Offering Reserved to Employees in accordance with French law n° 2004-803 of 9 August 2004 and French law n° 86-912 of 6 August 1986, 130,000 current and retired employees of the group became shareholders of the Company. In connection with the sale of 2.5% of EDF's capital on 3 December 2007, in accordance with the aforementioned laws, a new Offering Reserved to Current and Former Employees was proposed from 12 to 22 September 2008. There have been no reserved offerings since 2008.



On 31 December 2012, current and former employees of the EDF group held a total of 34 million EDF shares, i.e., 1.85% of share capital. Most of the shares held by employees are held via the Group Corporate Savings Plan.

### 17.4.8 Stock options

The Company has not implemented any stock option plan.

### 17.4.9 Bonus share issues

The bonus stock allotment plan implemented in August 2007, known as ACT 2007, involved the allotment of 2,883,183 shares to all Group employees<sup>1</sup>, i.e., approximately 150,000 beneficiaries in 22 countries.

More than 2.7 million shares were issued to beneficiary employees on 31 August 2009. The registered shares became available on 30 August 2011. The shares held via the Group Corporate Savings Plan will become available on 30 August 2014.

The Company has not made any new allocations of bonus stock since August 2007.

## 17.5 Social welfare policy

### 17.5.1 Status of employees in the Electricity and Gas Industries (EGI)

On 31 December 2012, almost all employees of EDF, ERDF, PEI, Électricité de Strasbourg and some employees of Tiru, held the status of employees in the Electricity and Gas Industries<sup>2</sup> (EGI). EGI status was introduced by the French decree of 22 June 1946 adopted in accordance with the French law of 8 April 1946, which nationalised the electricity and gas industries. It covers the current and retired staff of companies in the Electricity and Gas Industries.

In accordance with the provisions of articles L. 2233-1 and L. 2233-2 of the French Labour Code, the provisions of this status may be amended and the terms and conditions for their application set contractually through company-wide agreements, within the limits established by the status and, since French law n° 2000-108 of 10 February 2000 on the modernisation and expansion of the Electricity Public Service, by industry-wide agreements (articles L. 713-1 and L. 713-2 of the French Labour Code).

The status, in its main provisions, has evolved as follows: the special health & maternity insurance plan reformed by the decree of 30 March 2007 is now managed by the EGI Health Insurance Fund (Caisse d'Assurance Maladie des IEG, or CAMIEG) and the system of institutions representing personnel (IRP) was reformed by the law of 9 August 2004, adapting it to the rules of the French Labour Code. This reform resulted in amendments of the status by decree of 11 April 2007.

Furthermore, the special pension plan was reformed in 2008 and in 2010: the first time, within the context of the reform of special plans, and the second time within the context of the law of 9 November 2010 specifically reforming pensions under the general plan and the public sector.

For the rest, the status includes a set of provisions relating to areas similar to those of other industry-wide collective agreements (classification, compensation, hiring, discipline, paid vacation days, etc.).

#### 17.5.1.1 Special pension plan

The pension plan for the electricity and gas industries is a special social security system. Defined within the framework of the EGI employee status, the special system applies to all employees in the EGI sector. It was first reformed by the French law of 9 August 2004 concerning both the financing and management of the plan. Accordingly, the special pension plan has been managed by the Caisse Nationale des IEG (CNIEG), since 1 January 2005. This fund is now responsible for managing not only the age risk, but

also for the risks of occupational accidents, occupational diseases, disability and death as well as family benefits for inactive people.

The French law of 9 August 2004 and its implementing decrees set the principles for financing the EGI special pension plan from 1 January 2005. The single pension paid by the CNIEG to each EGI retiree is financed:

- partly by CNAVTS, AGIRC and ARRCO under financing agreements which set the conditions for affiliation of the EGI special plan with the standard mandatory plans. CNIEG pays to the standard mandatory plans the contributions paid by employees and employers in the EGI sector. In exchange, CNIEG receives from those plans the benefits that they would have paid to former (inactive) employees of EGI companies if they had been affiliated with the standard mandatory plans, called "basic plans". In accordance with agreements signed in 2005 with ARRCO and AGIRC for the affiliation of the EGI special pension plans with supplementary pension plans, the parties to both agreements negotiated in 2010 the final setting of the rate of validation of the rights acquired before 1 January 2005 as a result of the affiliation of the plan;
- partly by the CTA levy (Contribution Tarifaire d'Acheminement, or "CTA") received from gas and electricity transmission and distribution services;
- the remainder, corresponding to specific EGI retirement rights, is financed by employers.

The reform of the financing of pensions instituted by the French law of 9 August 2004 has had no effect at all on the standard plans, energy consumers or the French State budget.

Without challenging the new terms and conditions for the funding and management of the special EGI pension plan, a reform of pension rights came into force on 1 July 2008. It primarily introduced, as in the plan for public employees (French law of 21 August 2003), the following elements:

- a gradual extension of the insurance period in order to benefit from a full pension;
- discount and premium plans depending on the total insured period (all plans combined) by the insured;
- a rule to revalue pensions now linked to price changes rather than wage changes;
- new conditions, which are identical for men and women, in order to qualify for family benefits under pension plans.

These changes, as well as the removal of the 15 years' service requirement to benefit from the special pension plan, were introduced in appendix 3 of the national EGI personnel status by decree n° 2008-627 of 27 June 2008. This decree also amended the EGI special disability plan.

1. With the exception of Edison and EnBW employees mainly.

2. Personnel in other French subsidiaries of the Group do not fall under EGI status.



In addition, decree n° 2008-653 of 2 July 2008, which prohibits age and nationality conditions for hiring, has introduced various changes to the national status of employees and, in particular, an age limit of 65 years. The decree on forced retirement was repealed by decree n° 2008-1072 of 20 October 2008.

Decree n° 2008-1514 of 30 December 2008 issued the following provisions applicable from 1 January 2009:

- implementation of an early retirement program for long careers;
- revaluation of retirement and disability pensions on 1 April each year under the same conditions as those applicable to the general plan and the public sector plan;
- increase in the premium rate as for other pension plans;
- removal of the limit on total employment/retirement pension under the same conditions applicable to the general plan.

As a result of French law n° 2010-1330 of 9 November 2010 reforming pensions, the regulations of the special plan were modified by decree n° 2011-290 of 18 March 2011, which provides specifically for the gradual increase in the pension eligibility age by two years, including for early retirement. This provision will not enter into force until 2017, to take into account the schedule for implementing the 2008 reform. As in the public sector, retirement provisions relating to children will be eliminated and service time required to benefit from early retirement relating to active service will also be gradually raised by two years.

In accordance with this amendment, decree n° 2011-289 of 18 March 2011 gradually raised by two years the age limit for the employer to terminate the employment contract. From 2017, this limit shall be gradually increased from the age of 65 to 67.

The way in which difficult working conditions are taken into account is changing. The 2008 pension reform cut service credits for employees hired under EIG status from 1 January 2009. A sector-wide agreement signed on 16 April 2010 created a Retirement Day Savings Account (CEJR - Compte Epargne Jours Retraite) provisioned with days of leave allocated for the periods worked by these employees in jobs classed as active service. Decree n° 2011-1175 of 23 September 2011 also provided for the updating of the criteria and terms and conditions for the allocation of active service. A sector-wide frame of reference for the classification of jobs as active service led to the publication of an order in the Official Journal on 29 March 2012. The new method applies from 1 June 2012 (with temporary provisions for employees hired before 17 April 2010).

The extension of retirement options aged 60, introduced by the decree of 2 July 2012, shall apply to IEG pensions from 2017.

Finally, decree n° 2013-53 dated 15 January 2013 modifies the payment timing of pensions to IEG retirees. From 1st April 2013, pensions will not be paid quarterly in advance but monthly in advance, allowing to secure CNIEG funding by reducing its need for cash during the financial year. The decree also provides for an increase of the bereavement benefit, death benefit for the IEG regime, which passes from two to three months' pensions in the event of death of an inactive, to compensate for the effect of the removal of the pension quarterly payment.

## 17.5.1.2 EGI supplemental health plan

EGI status introduced a special health insurance plan and a mandatory social security plan for working and non-working employees in the industry. The plan is managed by the elected representatives of EGI employees and pensioners. It is managed by the CAMIEG. The system is supervised by the French State, which ensures compliance with the statutory documents and sets out the regulations and the level of contributions and benefits.

## 17.5.2 Supplemental social welfare

Since 2008, employees with EGI status working for the Group's companies in France have benefited from supplemental social welfare measures covering:

- the disability supplement (industry-wide agreement of 24 April 2008), applicable since 1 July 2008;
- provident coverage: death and education allowances (industry-wide agreement of 27 November 2008), applicable since 1 January 2009;
- the supplemental pension plan (industry-wide agreement of 21 February 2008 and Group agreement of 12 December 2008), supplemented by company provisions, applicable since 1 January 2009 (for ERDF, 1 October 2010);
- supplemental health coverage (industry-wide agreement of 4 June 2010), applicable since 1 January 2011.

In order to take account of new provisions introduced by the French law of 9 November 2010, an amendment to the Group agreement on supplemental pensions, dated 10 October 2011, now authorises employees of companies adhering to this agreement to make optional individual payments to their individual supplemental pension account. The Group agreement is applicable to EDF, EDF PEI, Électricité de Strasbourg and Tiru.

In addition, EDF signed on 10 October 2011 an amendment to the company agreement on Time Savings Accounts, in order to enable employees who so wish to make transfers of TSA entitlements to their individual supplemental pension accounts. This was also the case for EDF PEI and Tiru.

In February 2012, ERDF improved the supplemental pension plan for its employees by introducing, via a collective bargaining agreement, an employee contribution, and by increasing the employer contribution rate: ERDF now allows its employees to make individual optional payments to their individual supplemental pension account, either directly or by transferring cash-convertible rights held on their Time Savings Account.

## 17.5.3 Social dialogue and employee representation

### 17.5.3.1 Social dialogue in France

Social dialogue with employee representatives and union organisations is a key component of EDF's Group-wide human resources policy. One of EDF's priorities is to continue to observe a long tradition of social dialogue and consultation, promoting the company's objectives and the development of its employees.

Since the company elections held in November 2010, EDF has representatives from the CFDT, CFE-CGC, CGT and CGT-FO union organisations. In 2012, social dialogue was marked by the development of consultation on the company's strategy, particularly as part of a special seminar by the Central Works Council and by the launch of significant negotiations on themes of equal access to employment, Occupational and Skill Forecasting (GPEC - Gestion Prévisionnelle des Emplois et des Compétences) and senior employees.

In 2012, the main agreements signed were as follows:

- the collective bargaining agreement on equal access to employment for both men and women at EDF for 2012-2014, signed on 8 February 2012 by the 4 union organisations represented; the ERDF agreement was signed on 30 November 2012;
- the framework agreement on principles relating to the launching and conducting of experiments by EDF signed on 20 February 2012 by the CFDT and CFE-CGC unions;
- the agreement on the configuration of the EDF group for the renewal of the France Group Committee for 2012-2015 signed on 6 March 2012 by the CFDT, CGT and CGT-FO unions;

- the 2012 amendment to the EDF 2011-2013 profit-sharing agreement signed on 7 May 2012 by the CFDT, CFE-CGC and CGT-FO unions;
- the agreement on social measures applicable to the Island Energy Systems Division based on the insularity of its territories dated 29 June 2012 signed by the CFDT, CFE-CGC and CGT-FO unions;
- the collective bargaining agreement relating to the Fonds Agir Pour l'Emploi within EDF group (FAPE EDF - EDF "taking action on employment" fund) signed on 16 November 2012 by the 4 union organisations represented;
- a collective bargaining agreement on patents and additional compensation of employee/inventors within the Group was signed on 17 December 2012 by the CFDT, CGT and CGT-FO unions.

Further themes were examined in social dialogue in 2012 within certain EDF Divisions such as experiments with telecommuting, conversion programmes, relocation or sub-contracting.

ERDF was also involved in dynamic collective negotiations with the renewal of the collective bargaining agreements on equal access to employment, disability, profit-sharing and the signing of three new agreements (supplemental pension plan, socially-responsible sub-contracting and Occupational and Skill Forecasting<sup>1</sup>).

Finally, planned merger of Enerest acquired on April 2012 by ES Énergies Strasbourg (plan to be finalised in 2013) and the Offering Reserved to Employees (ORE), in addition to the profit-sharing agreement in force, were at the heart of social dialogue at Électricité de Strasbourg.

In terms of the professional branch of the Electricity and Gas Industries, the main agreements focused on:

- in terms of global compensation, 2012 was covered by a branch salary agreement signed on 24 November 2011 by the CFDT, CFE-CGC and CFTC unions. This agreement set the general increase measures applicable to employees in the branch;
- at the same time, consultation saw changes made to the scheme for the quarterly payment of pensions in the Electricity and Gas Industries, switching to monthly payment from 1 April 2013 and to transfer to the family benefit funds, from January 2013, the management of all legal family benefits;
- the consultation launched in 2011 for the implementation of the decree of 23 September 2011 relating to the classification of jobs as active or unhealthy service in the special staff pension plan was completed and the new provisions were implemented in 2012. In April 2012, an amendment to the agreement on continuous professional training in the sector was signed by the CFDT, CFE-CGC, CFTC and CGT-FO trade unions.

However, both attempts to negotiate an electoral protocol for the election of the Directors of the Social Activities Fund (CAS – Caisse d'Activités Sociales) failed, as the trade unions did not reach agreement.

Internationally, social dialogue mainly focused on:

- the 1st collective bargaining agreement signed in China;
- working time (EDF Luminus);
- the restructuring and the related social plans (Edison, Fenice, BEZrt);
- Corporate Responsibility (BEZrt);
- salaries (BEZrt, SSE);
- taking account of changes to legislation (SSE);
- pensions and the Supporting Excellence Programmes, which aims to improve the organisation of support functions (EDF Energy);
- the signing of an agreement between the trade unions at EDF Poloska and management regarding the social conditions of the merger between EDF Rybnik, EDF Krakow, "EDF Polska Centrala" and "EDF Polska CUW".

Finally, a key event in 2012 was the launch of the first internal opinion survey conducted worldwide within the EDF group. This survey, entitled "My EDF", is a precious tool for dialogue between management and employees, as employees are given the opportunity to express their opinion on and expectations for the policies and means put in place within their company and the measures necessary to progress together. More than 85,000 Group employees answered this survey.

### 17.5.3.2 Employee representation in France

In accordance with the French law of 9 August 2004 on the Electricity and Gas Public Service, new institutions representing personnel (IRP) were created through company elections on 29 November 2007, and statutory bodies were replaced by ordinary law entities (works councils, Central Works Council, staff representatives) in companies in the EGI sector.

Throughout EDF, there are currently 56 works councils, one Central Works Council and 113 employee representative councils.

The terms of office of the employee representatives last 3 years in the EGI sector and were renewed on 25 November 2010. Following the vote which, for the first time, was held in accordance with the law of 20 August 2008 relating to the renewal of social democracy, four union organisations still have representatives at EDF level (CGT, CFDT, CFE-CGC and CGT-FO). The next elections are scheduled for November 2013.

#### Central Social Activities Fund (Caisse Centrale d'Activités Sociales - CCAS)

Unlike the common practice in French law, the management of social and cultural activities is delegated to specific organisations in the EGI sector:

- the CCAS, which manages activities at the national level;
- the Additional Mutual Social Activity Funds (Caisses Mutuelles Complémentaires et d'Action Sociales - CASs) which manage local or decentralised social and cultural activities;
- the CAS Coordination Committee: it represents the CASs on a national level. It is responsible for distributing resources between the CCAS and the CASs.

Following the EGI sector negotiations and the creation on 1 April 2007 of the EGI Health Insurance Fund (Caisse d'Assurance Maladie des IEG or CAMIEG) dedicated to managing the special EGI health insurance plan, the CCAS and the CASs are now responsible for the management of social activities only.

A new organisation to manage social activities is gradually being implemented, leading to a decrease in the number of organisations and pooling of the management of certain areas (real estate, accounting, etc.). New management arrangements for staff working in these organisations are also under consideration. The financing of social activities in the EGI is provided by a deduction of 1% from the operating income of the companies distributing gas and electricity, principally EDF, GDF Suez and local distribution companies. In 2012, the amounts recorded by EDF and ERDF for this 1% were respectively €196 million and €104 million. In addition, in accordance with the provisions of article R. 2323-20 of the French Labour Code, expenses related to catering amounted to 37.8 million euros in 2012 for EDF and ERDF.

The CCAS, CASs and CAS Coordination Committee are legal entities and are fully independent. The CCAS is administered exclusively by employee representatives and is supervised by the public authorities.

Upon request from the public authorities to employers in the IEG sector, consultation with social partners on the question of financing, control and governance of social activities is ongoing.

1. GPEC - Gestion Prévisionnelle des Emplois et des Compétences.

## 17.6 Social dialogue bodies within EDF group

In the Group's other companies, mainly abroad, employee representation is organised in accordance with applicable local laws and regulations.

### European Works Council

At the end of 2001, the Group created a European Works Council (EWC), which is consulted on the Group's major policies. In May 2005, a revision of the agreement brought new provisions relating to the running of this body. Through its task forces, the EWC initiated numerous discussions on human resources policies at an international level, notably concerning health and safety within the Group's different companies in Europe or covering the opening of negotiations on the EDF group's social responsibility agreement.

The EDF group's EWC is now comprised of 34 permanent members and is informed of the Group's economic, financial and social strategies. At the end of the three year term set out in the agreement, the members of the EWC elected a new secretary of the Council in May 2011, and more than half of its members were renewed at this time. The EWC met twice over the past year and was, for the first time, attended by representatives of Italian employees.

### France Group Committee

An agreement relating to the creation of the France Group Committee was signed on 1 September 2008 by the 5 union organisations represented. In order to renew the body, an agreement on the configuration of the EDF France Group was signed by 3 union organisations (CFDT, CGT, CGT-FO) on 6 March 2012. Comprised of 28 elected members from the group's main companies (EDF, ERDF, RTE, Tiru, Fahrenheit, etc.), this committee is a forum for discussions to be held on a nationwide basis. The Group Committee met 4 times in 2012.

### Framework agreement on Corporate Social Responsibility (CSR)

The EDF CSR framework agreement was negotiated and signed on 24 January 2005 by all the employee representatives and union organisations of the Group's principal companies, as well as four international trade union federations for the industry.

This agreement provides the Group with a basis for shared commitments and common goals, which apply to EDF and to all the companies it

controls in accordance with the principle of subsidiarity. For the Group, this agreement contributes to the long-term improvement of its performance, the construction of a Group identity, and the renewal and broadening of the subjects of social dialogue.

In accordance with this agreement, social dialogue started within all the Group's signing companies in order to jointly identify the terms and conditions for local implementation and the measures to be taken as a priority.

An implementation report is drafted and presented each year to a body specifically created at Group level: the Dialogue Committee on the Group's Social Responsibility (DCSR).

Highlighting the progress made, the signing parties renegotiated a new agreement in the same spirit as the first one. Signed in January 2009 for a period of 4 years, this second agreement strengthens the Group's commitments, particularly on topics such as subcontracting, the fight against climate change and biodiversity.

### Respect of human rights

The current measures in place to monitor and verify the respect of human rights appear sufficient for most EDF group companies: HR process compliance, codes of conduct and internal rules of procedure, auditing and self assessment of practices. In addition to the standard points of contact (management, HR department, employee representatives), whistleblower procedures have been put in place by most companies for employees facing difficulties (ethics officer, Ombudsman, Ethics Committee, toll-free numbers, etc.).

For instance, Électricité de Strasbourg has appended a "Charter for the joint fight against harassment and violence at work" to the internal rules of procedures of Électricité de Strasbourg group companies since October 2011. As well as underlining the risks incurred by anyone breaching the relevant legal obligations, this charter defines the pre-litigation procedure put in place by the Électricité de Strasbourg group in case of hostile behaviour.

A new Group Ethics Code was drawn up in 2012 and is currently being rolled out to all Group company employees in every country and line of business.

Companies also took additional measures in 2012. For example, Edison introduced a new procedure for the assessment and monitoring of the respect of human rights, applicable to all its sites, in 2012. EDF Energy reinforced its Ethics Code in 2012, particularly on subjects relating to the prevention of discrimination, harassment and employee health.

## 17.7 Shareholding by Directors and trading in EDF securities by corporate officers and executives

### 17.7.1 Shareholding by Directors

On 31 December 2012, the members of the Company's Board of Directors held a total of 1,213 shares. The table, below, breaks down the number of EDF shares held individually by Directors on 31 December 2012 and 31 December 2011:

	Number of EDF shares held on 31/12/2012	Number of EDF shares held on 31/12/2011
Henri PROGLIO <sup>(1)</sup>	51	51
Christine CHABAUTY <sup>(2)</sup>	55	50
Philippe CROUZET <sup>(1)</sup>	200	200
Mireille FAUGÈRE <sup>(1)</sup>	106	106
Alexandre GRILLAT <sup>(2)</sup>	355	328
Michael JAY <sup>(1)</sup>	200	200
Bruno LAFONT <sup>(1)</sup>	150	150
Philippe MAÏSSA <sup>(1)</sup>	39	39
Pierre MARIANI <sup>(1)</sup>	1	1
Marie-Hélène MEYLING <sup>(1)</sup>	28	28
Maxime VILLOTA <sup>(2)</sup>	28	26
<b>TOTAL</b>	<b>1,213</b>	<b>1,179</b>

(1) Shares held directly.

(2) Shares held through a mutual fund.

Mrs. Lepetit, Messrs. Azéma, Dubertret, d'Escatha, Loos Rignac and Sellal held no shares in EDF on 31 December 2012.

### 17.7.2 Trading in Company securities

Under the terms of article L. 621-18-2 of the French Monetary and Financial Code, the executives of companies with shares listed for trading on a regulated market must declare trades in company securities to the AMF and to the company within five trading days of their completion.

The AMF General Regulations <sup>1</sup> also state that the EDF Board of Directors must mention in its annual report to the Shareholders' Meeting trades that have been declared by executives and similar employees <sup>2</sup> during the past fiscal year.

No trades involving EDF shares were declared to the AMF or to the Company during the 2012 fiscal year by members of the Company's Board of Directors and Executive Committee.

1. Article 223-26 of the AMF General Regulations.

2. EDF's staff "similar to executives" are the members of the Company's Executive Committee.





# 18 Major Shareholders

## 18.1 Breakdown of share capital and voting rights

During the last three fiscal years, the breakdown of EDF's share capital as of 31 December was as follows:

	Position as of 31/12/2012			Position as of 31/12/2011			Position as of 31/12/2010		
	Number of shares	% of share capital	% voting rights	Number of shares	% of share capital	% voting rights	Number of shares	% of share capital	% voting rights
French State	1,561,222,705	84.44	84.54	1,561,222,705	84.44	84.50	1,561,973,336	84.48	84.51
Institutions and individuals	251,350,774	13.59	13.61	252,420,651	13.65	13.66	242,118,351	13.10	13.10
Employee	34,131,850 <sup>(1)</sup>	1.85	1.85	34,047,712 <sup>(2)</sup>	1.84	1.84	44,226,374 <sup>(3)</sup>	2.39	2.39
Treasury shares	2,161,333	0.12	–	1,175,594	0.07	–	548,601	0.03	–
<b>TOTAL</b>	<b>1,848,866,662</b>	<b>100.00</b>	<b>100.00</b>	<b>1,848,866,662</b>	<b>100.00</b>	<b>100</b>	<b>1,848,866,662</b>	<b>100.00</b>	<b>100.00</b>

(1) This figure includes 29,042,964 shares (representing 1.57% of capital) on the basis of the definition of employee share ownership as defined by Article L.225-102 of the French Commercial Code (including shares owned by EDF's current and former employees through the "Actions EDF" FCPE of the EDF group savings plan and EDF International group savings plan. This figure also includes 5.1 million shares representing 0.28% of the capital held in direct registered form or administered, without a lock-in period or after lock-in periods, by current employee shareholders and former employees.

(2) This figure includes 28,785,426 shares (representing 1.56% of capital) on the basis of the definition of employee share ownership as defined by Article L.225-102 of the French Commercial Code (including shares owned by EDF's current and former employees through the "Actions EDF" FCPE of the EDF group savings plan and EDF International group savings plan. This figure also includes 5.3 million shares representing 0.28% of the capital held in direct registered form or administered, without a lock-in period or after lock-in periods, by current employee shareholders and former employees.

(3) This figure includes 39,875,700 shares (representing 2.16% of capital) on the basis of the definition of employee share ownership as defined by Article L.225-102 of the French Commercial Code (including 38,838,151 shares owned by EDF's current and former employees through the "Actions EDF" FCPE of the EDF group savings plan and EDF International group savings plan. This figure also includes 4.3 million shares representing 0.23% stake held in direct registered form or administered, without lock-in period or after lock-in periods, by employee shareholders and former employees.

To EDF's knowledge, no shareholder other than the French State holds directly or indirectly more than 5% of a capital and voting rights.

The Company has completed a study on the identifiable holders of bearer shares as of 31 December 2012, which has been used to analyse the distribution of the share capital and its breakdown by geographical area. The table, below, shows this repartition at 31 December 2012 and at 31 December 2011:

	31 December 2012		31 December 2011	
	Number of shares held	% of capital	Number of shares held	% of capital
French government	1,561,222,705	84.44	1,561,222,705	84.44
Institutional investors Europe excluding France	73,587,074	3.98	86,958,349	4.70
Institutional investors rest of the world	64,380,889	3.48	56,525,378	3.06
Institutional investors France	53,297,374	2.88	56,721,741	3.07
Retail investors	60,085,437	3.25	52,215,183	2.82
Employee shareholding	34,131,850	1.85	34,047,712	1.84
Treasury shares	2,161,333	0.12	1,175,594	0.07
<b>TOTAL</b>	<b>1,848,866,662</b>	<b>100.00</b>	<b>1,848,866,662</b>	<b>100.00</b>

## 18.2 Agreements which could lead to a change of control

To EDF's knowledge, there is no agreement which could subsequently lead to a change of control.

In accordance with article L. 111-67 of the French Energy Code, the French State cannot hold less than 70% in EDF.



Photo credit © EDF – Philippe Eranian

# 19 Related party transactions

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In addition to the information set out below, the details of the transactions concluded by the Company with related parties, as defined by the IFRS, in respect of the 2012 financial year, are contained in note 49 to the consolidated financial statements for the financial year ended 31 December 2012.

The information on the regulated agreements and commitments referred to in Article L. 225-38 of the French Commercial Code is contained in the Statutory Auditors' special report, which is reproduced in Appendix C to this reference document.

## Relations with the French State

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As of 31 December 2011, the French State held 84.44 % of the share capital and 84.54% of the voting rights in EDF. Pursuant to the article L. 111-67 of the French Energy Code, the state must remain the owner of at least 70% of its capital. The French State thus has the option, as the majority shareholder, of reviewing corporate decisions that require the approval of the shareholders and, in particular, of determining the result of the shareholders' vote for all issues over which General Meetings have authority.

The regulations applicable to EDF, as a result of its majority ownership by the French State, are described in section 6.5 ("Legislative and regulatory environment").

The relations with the French State are also described in note 49 to the consolidated financial statements for the financial year ended 31 December 2012.

## Relations with GDF SUEZ

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The law of 7 December 2006 on the energy sector required the creation of a service, which does not exist as a legal entity in its own right, that is common to the two subsidiaries of the EDF and Gaz de France groups, which are respectively tasked with the distribution of electricity and gas. In accordance

with this legal framework, the two subsidiaries of EDF and GDF SUEZ, ERDF and GrDF, share a common service for which the organisational and functional rules are described in section 6.2.2.2.1 ("Organisation of ERDF").

## Relations with the AREVA group

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Relations with the AREVA group are primarily described in sections 4.3 ("Dependency factors"), 6.2.1.1.3.4 ("The nuclear fuel cycle and related issues"), 6.2.1.1.3.5 ("Preparing for the future of nuclear fleet in France" – "Operating period of the EDF PWR plants" and "the

European Pressurised water Reactor ("EPR") and the other reactors"), 6.2.1.1.3.6 ("Decommissioning of nuclear power plants") and in note 49 to the consolidated financial statements for the financial year ended 31 December 2012.

## Relations with other companies in the consolidation scope

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The transactions entered into with RTE are described in note 23 to the consolidated financial statements for the financial year ended 31 December 2012.

The other transactions with companies that are proportionally consolidated and affiliated companies are comprised of energy purchases and sales.







# 20 Financial information on assets, the financial statements and results of the Company

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## 20.1 Historical financial information

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Pursuant to article 28 of the European Commission Regulation 809/2004, the following information is included by reference in this reference document:

- the consolidated financial statements of the EDF group for the year ended 31 December 2011 (prepared in accordance with international accounting standards), as well as the associated Statutory Auditors' reports, set forth respectively in section 20.1 (pages 289 to 385) and section 20.2 (pages 386 and 387) of the EDF group's 2011 reference document;
- the consolidated financial statements of the EDF group for the year ended 31 December 2010 (prepared in accordance with international accounting standards), as well as the associated Statutory Auditors' reports, set forth respectively in section 20.1 (pages 269 to 383) and section 20.2 (pages 384 and 385) of the EDF group's 2010 reference document.

The consolidated financial statements at 31 December 2012, established under IAS-IFRS standards, are set forth below. These financial statements will be submitted for approval by the Shareholders' Meeting of 30 May 2013.

## Consolidated income statements

(in millions of Euros)	Notes	2012	2011 <sup>(1)</sup>
Sales	7	72,729	65,307
Fuel and energy purchases	8	(37,098)	(30,195)
Other external expenses	9	(10,087)	(9,931)
Personnel expenses	10	(11,624)	(10,802)
Taxes other than income taxes	11	(3,287)	(3,101)
Other operating income and expenses	12	5,451	3,661
<b>Operating profit before depreciation and amortisation</b>		<b>16,084</b>	<b>14,939</b>
Net changes in fair value on Energy and Commodity derivatives, excluding trading activities		(69)	(116)
Net depreciation and amortisation		(6,849)	(6,285)
Net increases in provisions for renewal of property, plant and equipment operated under concessions		(164)	(221)
(Impairment)/reversals	13	(752)	(640)
Other income and expenses	14	(5)	775
<b>Operating profit</b>		<b>8,245</b>	<b>8,452</b>
Cost of gross financial indebtedness	15.1	(2,443)	(2,271)
Discount effect	15.2	(3,285)	(3,064)
Other financial income and expenses	15.3	2,366	1,555
<b>Financial result</b>	<b>15</b>	<b>(3,362)</b>	<b>(3,780)</b>
<b>Income before taxes of consolidated companies</b>		<b>4,883</b>	<b>4,672</b>
Income taxes	16	(1,586)	(1,336)
Share in income of associates	23	260	51
<b>GROUP NET INCOME</b>		<b>3,557</b>	<b>3,387</b>
<b>EDF net income</b>		<b>3,316</b>	<b>3,148</b>
<b>Net income attributable to non-controlling interests</b>		<b>241</b>	<b>239</b>
<b>Earnings per share (EDF share) in Euros:</b>	<b>17</b>		
Earnings per share		1.80	1.70
Diluted earnings per share		1.80	1.70

(1) Figures for 2011 have been restated for the impact of the change in accounting method for actuarial gains and losses on post-employment benefits (see note 2).

### Statements of net income and gains and losses recorded directly in equity

	Notes	2012			2011 <sup>(1)</sup>		
		EDF net income	Net income attributable to non-controlling interests	Total	EDF net income	Net income attributable to non-controlling interests	Total
<i>(in millions of Euros)</i>							
Group net income		3,316	241	3,557	3,148	239	3,387
Gross change in fair value of available-for-sale financial assets <sup>(2)</sup>		937	-	937	(660)	-	(660)
Related tax effect		(351)	-	(351)	176	-	176
<i>Change in fair value of available-for-sale financial assets</i>	36.2.2	586	-	586	(484)	-	(484)
Gross change in fair value of hedging instruments <sup>(2)</sup>		(782)	20	(762)	(1,303)	43	(1,260)
Related tax effect		160	(9)	151	275	(14)	261
<i>Change in fair value of hedging instruments</i>	41.4	(622)	11	(611)	(1,028)	29	(999)
Gross change in actuarial gains and losses on post-employment benefits		(4,952)	54	(4,898)	(768)	(23)	(791)
Related tax effect		657	(13)	644	268	2	270
<i>Change in actuarial gains and losses on post-employment benefits</i>		(4,295)	41	(4,254)	(500)	(21)	(521)
<i>Translation adjustments</i>		446	82	528	578	35	613
Gains and losses recorded directly in equity		(3,885)	134	(3,751)	(1,434)	43	(1,391)
<b>NET INCOME AND GAINS AND LOSSES RECORDED DIRECTLY IN EQUITY</b>		<b>(569)</b>	<b>375</b>	<b>(194)</b>	<b>1,714</b>	<b>282</b>	<b>1,996</b>

(1) Figures for 2011 have been restated for the impact of the change in accounting method for actuarial gains and losses on post-employment benefits (see note 2).

(2) Gross changes in fair value transferred to income in respect of available-for-sale financial assets and hedging instruments are presented in notes 36.2.2 et 41.4 respectively.



## Consolidated balance sheets

### ASSETS

<i>(in millions of Euros)</i>	Notes	31/12/2012	31/12/2011 <sup>(1)</sup>
Goodwill	18	10,412	11,648
Other intangible assets	19	7,625	4,702
Property, plant and equipment operated under French public electricity distribution concessions	20	47,222	45,501
Property, plant and equipment operated under concessions for other activities	21	7,182	6,022
Property, plant and equipment used in generation and other tangible assets owned by the Group	22	67,838	60,445
Investments in associates	23	7,555	7,544
Non-current financial assets	36	30,471	24,260
Deferred tax assets	16.3	3,487	3,159
<b>Non-current assets</b>		<b>181,792</b>	<b>163,281</b>
Inventories	24	14,213	13,581
Trade receivables	25	22,497	20,908
Current financial assets	36	16,433	16,980
Current tax assets		582	459
Other receivables	26	8,486	10,309
Cash and cash equivalents	37	5,874	5,743
<b>Current assets</b>		<b>68,085</b>	<b>67,980</b>
<b>Assets classified as held for sale</b>	46	<b>241</b>	<b>701</b>
<b>TOTAL ASSETS</b>		<b>250,118</b>	<b>231,962</b>

(1) Figures for 2011 have been restated for the impact of the change in accounting method for actuarial gains and losses on post-employment benefits (see note 2).

## EQUITY AND LIABILITIES

<i>(in millions of Euros)</i>	Notes	<b>31/12/2012</b>	31/12/2011 <sup>(1)</sup>
Capital	27	924	924
EDF net income and consolidated reserves		24,934	27,559
<b>Equity (EDF share)</b>		<b>25,858</b>	<b>28,483</b>
Equity (non-controlling interests)		4,854	4,189
<b>Total equity</b>	<b>27</b>	<b>30,712</b>	<b>32,672</b>
Provisions related to nuclear generation – Back-end nuclear cycle, plant decommissioning and last cores	29	39,185	37,198
Provisions for decommissioning of non-nuclear facilities	30	1,090	809
Provisions for employee benefits	31	19,540	14,611
Other provisions	32	1,873	1,338
<b>Non-current provisions</b>	<b>28</b>	<b>61,688</b>	<b>53,956</b>
Special French public electricity distribution concession liabilities	33	42,551	41,769
Non-current financial liabilities	38.1	46,980	42,688
Other non-current liabilities	35	4,218	4,989
Deferred tax liabilities	16.3	5,601	4,479
<b>Non-current liabilities</b>		<b>161,038</b>	<b>147,881</b>
Current provisions	28	3,894	4,062
Trade payables	34	14,643	13,681
Current financial liabilities	38.1	17,521	12,789
Current tax liabilities		1,224	571
Other current liabilities	35	21,037	19,900
<b>Current liabilities</b>		<b>58,319</b>	<b>51,003</b>
Liabilities related to assets classified as held for sale	46	49	406
<b>TOTAL EQUITY AND LIABILITIES</b>		<b>250,118</b>	<b>231,962</b>

(1) Figures for 2011 have been restated for the impact of the change in accounting method for actuarial gains and losses on post-employment benefits (see note 2).

## Consolidated cash flow statements

(in millions of Euros)	Notes	2012	2011 <sup>(1)</sup>
<b>Operating activities:</b>			
Income before taxes of consolidated companies		4,883	4,672
Impairment (reversals)		752	640
Accumulated depreciation and amortisation, provisions and changes in fair value		9,197	7,210
Financial income and expenses		944	1,117
Dividends received from associates		201	334
Capital gains/losses		(443)	(737)
Change in working capital	43.1	(2,390)	(1,785)
<b>Net cash flow from operations</b>		<b>13,144</b>	<b>11,451</b>
Net financial expenses disbursed		(1,634)	(1,623)
Income taxes paid		(1,586)	(1,331)
<b>Net cash flow from operating activities</b>		<b>9,924</b>	<b>8,497</b>
<b>Investing activities:</b>			
Investments, net of cash acquired/transferred <sup>(2)</sup>		20	3,624
Investments in intangible assets and property, plant and equipment	43.2	(13,386)	(11,134)
Net proceeds from sale of intangible assets and property, plant and equipment		748	497
Changes in financial assets		(1,792)	222
<b>Net cash flow used in investing activities</b>		<b>(14,410)</b>	<b>(6,791)</b>
<b>Financing activities:</b>			
Transactions with non-controlling interests <sup>(3)</sup>		(1,038)	(1,324)
Dividends paid by parent company	27.3	(2,125)	(2,122)
Dividends paid to non-controlling interests		(230)	(261)
Purchases/sales of treasury shares	27.2	(15)	(14)
<b>Cash flows with shareholders</b>		<b>(3,408)</b>	<b>(3,721)</b>
Issuance of borrowings		12,431	5,846
Repayment of borrowings		(4,869)	(4,071)
Funding contributions received for assets operated under concessions		190	194
Investment subsidies		313	161
<b>Other cash flows from financing activities</b>		<b>8,065</b>	<b>2,130</b>
<b>Net cash flow from financing activities</b>		<b>4,657</b>	<b>(1,591)</b>
<b>Net increase/(decrease) in cash and cash equivalents</b>		<b>171</b>	<b>115</b>
<b>CASH AND CASH EQUIVALENTS - OPENING BALANCE</b>		<b>5,743</b>	<b>5,567</b>
Net increase/(decrease) in cash and cash equivalents		171	115
Effect of currency fluctuations		(44)	54
Financial income on cash and cash equivalents		38	44
Effect of reclassifications		(34)	(37)
<b>CASH AND CASH EQUIVALENTS - CLOSING BALANCE</b>	<b>37</b>	<b>5,874</b>	<b>5,743</b>

(1) Figures for 2011 have been restated for the impact of the change in accounting method for actuarial gains and losses on post-employment benefits (see note 2).

(2) The impact of disposal of the investment in EnBW during 2011 amounts to €3.8 billion (payment received of €4.5 billion net of €738 million cash transferred).

(3) Contributions via capital increases or reductions and acquisitions of additional interests in controlled companies.

In 2012, payments made for transactions with non-controlling interests include the acquisition of additional interests in the Edison group following the mandatory public offer finalised on 6 September 2012 for €(869) million, and in ERSa following the acquisition of EnBW's investment in that subsidiary on 16 February 2012 for €(252) million (see notes 3.1 and 5.1.1 respectively).

In 2011, €(1,462) million was paid for the acquisition of additional interests in EDF Énergies Nouvelles.

## Changes in consolidated equity

	Capital	Treasury shares	Translation adjustments	Impact of fair value adjustment of financial instruments <sup>(1)</sup>	Other consolidate reserves and net income	Equity (EDF share)	Equity (share attributable to non-controlling interests)	Total equity
<i>(in millions of Euros)</i>								
<b>Equity at 31/12/2010</b>	<b>924</b>	<b>(19)</b>	<b>543</b>	<b>400</b>	<b>29,469</b>	<b>31,317</b>	<b>5,586</b>	<b>36,903</b>
Restatements due to change of method <sup>(2)</sup>	-	-	26	-	(1,697)	(1,671)	(121)	(1,792)
<b>Equity at 31/12/2010 (restated)</b>	<b>924</b>	<b>(19)</b>	<b>569</b>	<b>400</b>	<b>27,772</b>	<b>29,646</b>	<b>5,465</b>	<b>35,111</b>
Gains and losses recorded directly in equity	-	-	578	(1,512)	(500)	(1,434)	43	(1,391)
Net income	-	-	-	-	3,148	3,148	239	3,387
<b>Net income and gains and losses recorded directly in equity</b>	<b>-</b>	<b>-</b>	<b>578</b>	<b>(1,512)</b>	<b>2,648</b>	<b>1,714</b>	<b>282</b>	<b>1,996</b>
EDF capital increase <sup>(3)</sup>	6	(324)	-	-	300	(18)	-	(18)
EDF capital reduction <sup>(3)</sup>	(6)	324	-	-	(318)	-	-	-
Dividends paid	-	-	-	-	(2,122)	(2,122)	(262)	(2,384)
Purchases/sales of treasury shares	-	(7)	-	-	-	(7)	-	(7)
Other changes <sup>(4)</sup>	-	-	-	39	(769)	(730)	(1,296)	(2,026)
<b>Equity at 31/12/2011 (restated)</b>	<b>924</b>	<b>(26)</b>	<b>1,147</b>	<b>(1,073)</b>	<b>27,511</b>	<b>28,483</b>	<b>4,189</b>	<b>32,672</b>
Gains and losses recorded directly in equity	-	-	446	(36)	(4,295)	(3,885)	134	(3,751)
Net income	-	-	-	-	3,316	3,316	241	3,557
<b>Net income and gains and losses recorded directly in equity</b>	<b>-</b>	<b>-</b>	<b>446</b>	<b>(36)</b>	<b>(979)</b>	<b>(569)</b>	<b>375</b>	<b>(194)</b>
Dividends paid	-	-	-	-	(2,125)	(2,125)	(231)	(2,356)
Purchases/sales of treasury shares	-	(7)	-	-	-	(7)	-	(7)
Other changes <sup>(5)</sup>	-	-	-	-	76	76	521	597
<b>EQUITY AT 31/12/2012</b>	<b>924</b>	<b>(33)</b>	<b>1,593</b>	<b>(1,109)</b>	<b>24,483</b>	<b>25,858</b>	<b>4,854</b>	<b>30,712</b>

(1) These changes correspond to the effects of fair value adjustment of available-for-sale financial assets and amounts transferred to income following changes in their fair value, and the effects of fair value adjustment of financial instruments hedging cash flows and net foreign investments and amounts transferred to income in respect of terminated contracts. For details see the statement of net income and gains and losses recorded directly in equity.

(2) Figures at 31 December 2011 and 31 December 2010 have been restated for the impact of the change in accounting method for actuarial gains and losses on post-employment benefits (see note 2).

(3) EDF's capital increase and capital reduction operations relate to the simplified alternative public cash or exchange offer for shares of EDF Énergies Nouvelles.

(4) Other changes (EDF's share and the share attributable to non-controlling interests) include €(716) million and €(764) million respectively reflecting the effects of acquisition of minority shareholdings in EDF Énergies Nouvelles. Other changes in equity attributable to non-controlling interests also include the effects of deconsolidation of EnBW, amounting to €(519) million.

(5) In 2012, other changes attributable to non-controlling interests include €406 million corresponding to the effects of the takeover of Edison and the mandatory public offer (EDF holds 97.4% ownership at 31 December 2012), of which €266 million are indirect non-controlling interests (see note 3.1).

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## Notes to the consolidated financial statements

Électricité de France (EDF or the "Company") is a French *société anonyme* governed by French Law, and registered in France.

The Company's consolidated financial statements include the accounts of companies directly or indirectly under the exclusive control of the Company and its subsidiaries, which are fully consolidated, the accounts of jointly-controlled companies (joint ventures), which are proportionally consolidated, and the accounts of companies in which the Company exercises significant influence (associates), which are accounted for under the equity method. All these economic entities are collectively referred to as the "Group".

The Group is an integrated energy operator engaged in all aspects of the energy business: generation, transmission, distribution, supply and trading of energies.

The Group's consolidated financial statements at 31 December 2012 were prepared under the responsibility of the Board of Directors and approved by the Directors at the Board meeting held on 13 February 2013. They will become final after approval at the General Shareholders' Meeting to be held on 30 May 2013.

## ➤ Note 1 Group accounting standards

### 1.1 Declaration of conformity and Group accounting policies

Pursuant to European regulation 1606/2002 of 19 July 2002 on the adoption of international accounting standards, the EDF group's consolidated financial statements for the year ended 31 December 2012 are prepared under the international accounting standards published by the IASB and approved by the European Union for application at 31 December 2012. These international standards are IAS (International Accounting Standards), IFRS (International Financial Reporting Standards), and SIC and IFRIC interpretations.

The comparative figures for 2011 reported in the notes to the financial statements have been restated as a result of the change in accounting method for actuarial gains and losses on post-employment benefits (see note 2).

### 1.2 Changes in accounting methods at 31 December 2012

Apart from the changes indicated below, the accounting and valuation methods applied by the Group in the consolidated financial statements for the year ended 31 December 2012 are identical to those used in the consolidated financial statements for the year ended 31 December 2011.

#### 1.2.1 Accounting changes introduced in the consolidated financial statements at 31 December 2012

##### ■ Change of accounting option concerning recognition of actuarial gains and losses on post-employment benefits

IAS 19 allows the following methods for recognition of actuarial gains and losses on post-employment defined benefit plans:

- either the full amount of such gains and losses, or a portion as determined under the "corridor" method, is recorded through the income statement; the Group applied this approach until 31 December 2011;
- or they are recorded in full through other components of net income and gains and losses recorded directly in equity.

The Group decided to use the option to record actuarial gains and losses for post-employment benefits in the statement of net income and gains and losses recorded directly in equity from 1 January 2012. The Group considers that this change will make information on post-employment benefits clearer and more comprehensible.

This change of accounting method is applied retrospectively, as required by IAS 8. Note 2 presents a description of this change of accounting method and calculations of its main effects.

##### ■ Disclosures on transfers of financial assets

The amendment to IFRS 7, "Financial instruments: disclosures – Transfers of financial assets" adopted by the European Union in 2011 became mandatory on 1 January 2012.

In application of this amendment, the EDF group's financial statements now include additional disclosures concerning transfers of derecognised financial assets, so that readers can assess the nature of the Group's involvement in these derecognised assets, and the associated risks.

As IFRS 7 concerns disclosures, this amendment has no impact on the accounting methods applied in the consolidated financial statements.

### 1.2.2 Standards and amendments adopted by the European Union in 2012 but not yet mandatory and not applied early by the Group

The Group is currently assessing the potential impact of the following standards, which were adopted by the IASB in 2011:

- IFRS 10 "Consolidated financial statements";
- IFRS 11 "Joint arrangements";
- IFRS 12 "Disclosure of interests in other entities";
- IAS 27 (2011) "Individual financial statements";
- IAS 28 (2011) "Investments in associates and joint ventures".

Based on the analyses conducted to date, the Group concludes that application of the following standards, interpretations and amendments will not have any significant impact:

- IFRS 13 "Fair value measurement";
- IFRIC 20 "Stripping Costs in the Production Phase of a Surface Mine";
- amendments to IAS 1 entitled "Presentation of items of other comprehensive income (OCI)";
- amendments to IAS 12 entitled "Deferred Tax: Recovery of Underlying Assets";
- amendments to IAS 19 entitled "Employee benefits" on defined-benefit plans;
- amendments to IFRS 1 entitled "Severe hyperinflation and removal of fixed dates for first-time adopters";
- amendments to IAS 32 on Offsetting Financial Assets and Financial Liabilities;
- amendments to IFRS 7 on disclosures concerning offsetting of financial assets and financial liabilities.

### 1.2.3 Other standards not applied early by the Group

The Group has not applied the following standards, amendments and interpretations, which are expected to be approved by the European Union in 2013 at the earliest:

- amendments to IFRS 1 entitled "Government loans";
- annual improvements to IFRS (2009-2011);
- amendments to IFRS 10, 11 and 12 on "Transition guidance";
- amendments to IFRS 10 and 12 and IAS 27 on "Investment entities".

The potential impact of these amendments is currently being evaluated by the Group.

Finally, as part of the ongoing overhaul of IAS 39, the IASB released a new standard, IFRS 9, "Financial instruments – Phase 1, Classification and Measurement" in November 2009, then an amended version in October 2010. In December 2011 the application date of this new standard was deferred to 1 January 2015, and it is therefore not applicable at 31 December 2012.

### 1.3 Summary of the principal accounting and valuation methods

The following accounting methods have been applied consistently through all the periods presented in the consolidated financial statements.

#### 1.3.1 Valuation

The consolidated financial statements are based on historical cost valuation, with the exception of certain assets acquired and liabilities assumed through business combinations, and certain financial instruments, which are stated at fair value.

#### 1.3.2 Management judgments and estimates

The preparation of the financial statements requires the use of judgments, best estimates and assumptions in determining the value of assets and liabilities, income and expenses recorded for the period, considering positive and negative contingencies existing at year-end. The figures in the Group's future financial statements could differ significantly from current estimates due to changes in these assumptions or economic conditions.

The principal sensitive accounting methods involving use of estimates and judgments are described below.

In a context characterised by financial market volatility, the parameters used to prepare estimates are based on macro-economic assumptions appropriate to the very long-term cycle of Group assets.

##### 1.3.2.1 Nuclear provisions

The measurement of provisions for the back-end of the nuclear cycle, decommissioning and last cores is sensitive to assumptions concerning costs, inflation rate, long-term discount rate, and disbursement schedules. A revised estimate is therefore established at each closing date to ensure that the amounts accrued correspond to the best estimate of the costs eventually to be borne by the Group. Any significant differences resulting from these revised estimates could entail changes in the amounts accrued.

The main assumptions and sensitivity analyses are presented in note 29.1.5.

##### 1.3.2.2 Pensions and other long-term and post-employment benefits

The value of pensions and other long-term and post-employment benefit obligations is based on actuarial valuations that are sensitive to all the actuarial assumptions used, particularly concerning discount rates and wage increase rates.

The principal actuarial assumptions used to calculate these post-employment and long-term benefits at 31 December 2012 are presented in note 31. These assumptions are updated annually. The Group considers the actuarial assumptions used at 31 December 2012 appropriate and well-founded, but future changes in these assumptions could have a significant effect on the amount of the obligations and the Group's equity and net income. Sensitivity analyses are therefore presented in note 31.

##### 1.3.2.3 Impairment of goodwill and long-term assets

Impairment tests on goodwill and long-term assets are sensitive to the macro-economic and segment assumptions used – particularly concerning energy price movements – and medium-term financial forecasts. The Group therefore revises the underlying estimates and assumptions based on regularly updated information.

These assumptions, which are specific to the Group, are presented in note 13.

##### 1.3.2.4 Financial instruments

In measuring the fair value of unlisted financial instruments (essentially energy contracts), the Group uses valuation models based on a certain number of assumptions subject to unforeseeable developments.

##### 1.3.2.5 Energy supplied but not yet measured and billed

As explained in note 1.3.7, the quantities of energy supplied but not yet measured and billed are calculated at the reporting date based on consumption statistics and selling price estimates. Determination of the unbilled portion of sales revenues at the year-end is sensitive to the assumptions used to prepare these statistics and estimates.

##### 1.3.2.6 Obligations concerning French public distribution concession assets to be replaced

In view of the specific nature of French public electricity distribution concessions, the Group has opted to present its obligation to renew concession assets in the balance sheet at a value based on the amount of contractual commitments as calculated and disclosed to the grantors in the annual business reports. An alternative approach would be to value the obligations based on the present value of future payments necessary to replace these assets at the end of their industrial useful life. The impacts this alternative approach would have had on the accounts are shown in note 1.3.24 for information. Whatever valuation method is used, measurement of the concession liability concerning assets to be replaced is notably subject to unforeseeable developments in terms of cost, useful life and disbursement dates.

##### 1.3.2.7 Deferred tax assets

The use of estimates and assumptions over recovery horizons is particularly important in the recognition of deferred tax assets.

##### 1.3.2.8 Other judgments

When there is no standard or interpretation applicable to a specific transaction, the Group exercises judgment to define and apply accounting methods that supply relevant and reliable information for preparation of its financial statements.

### 1.3.3 Consolidation methods

Subsidiaries are companies in which the Group has exclusive control and are fully consolidated. Exclusive control means the power to govern a company's financial and operating policies either directly or indirectly so as to obtain benefit from its activities. Exclusive control is presumed when EDF directly or indirectly holds more than 50% of the voting rights. Voting rights that are potentially exercisable at the closing date, even by another party, are taken into consideration in determining the level of control over a subsidiary.

Joint ventures are companies that the Group jointly controls, and are proportionally consolidated on the basis of the Group's percentage interest. Joint control is the contractually agreed sharing of control over a company run jointly by a limited number of partners or shareholders, such that the financial and operating policies require their unanimous consent.

Associates are entities in which the Group exercises significant influence over financial and operating policies, without having exclusive or joint control. The Group is considered to exercise significant influence when it holds at least 20% of the consolidated company. Associates are accounted for under the equity method. They are carried in the balance sheet at historical cost adjusted for the share of net assets generated after acquisition, less any impairment. The Group's share in net income for the period is reported under the income statement heading "Share in income of associates".

All internal transactions between consolidated companies, including realised internal profits, are eliminated.

A list of subsidiaries, joint ventures and associates is presented in note 52.

## 1.3.4 Financial statement presentation rules

Assets and liabilities of dissimilar natures or functions are disclosed separately.

Assets and liabilities contributing to working capital used in the entity's normal operating cycle are classified as current. Other assets and liabilities are classified as current if they mature within one year of the closing date, and non-current if they mature more than one year after the closing date.

Commitments given by the Group to purchase minority interests in Group-controlled companies are included in liabilities. For commitments of this kind given since 1 January 2010, the differential between the value of the minority interests and the liability corresponding to the commitment is recorded in equity.

The income statement presents items by nature. The heading "Other income and expenses" presented below the operating profit before depreciation and amortisation comprises items of an unusual nature or amount.

In the cash flow statements, cash flows related to operating activities are presented under the indirect method.

## 1.3.5 Translation methods

### 1.3.5.1 Reporting currency

The Group's financial statements are presented in Euros, the parent company's functional currency. All financial data are rounded up or down to the nearest million.

### 1.3.5.2 Functional currency

An entity's functional currency is the currency of the economic environment in which it primarily operates. In most cases, the local currency is the functional currency, but for some entities, a functional currency other than the local currency may be used provided it reflects the currency used in the principal transactions.

### 1.3.5.3 Translation of the financial statements of foreign companies whose functional currency is not the Euro

The financial statements of foreign companies whose functional currency is not the Euro are translated as follows:

- balance sheets are translated into Euros at the closing rate;
- income statements and cash flows are translated at the average rate for the period;
- resulting differences are recognised in equity under the heading "Translation adjustments".

Translation adjustments affecting a monetary item that is an integral part of the Group's net investment in a consolidated foreign company are included in consolidated equity until the disposal or liquidation of the net investment, at which date they are recognised as income or expenses in the income statement, in the same way as other exchange differences concerning the company.

### 1.3.5.4 Translation of transactions in foreign currencies

In application of IAS 21, transactions expressed in foreign currencies are initially translated and recorded in the functional currency of the entity concerned, using the rate in force at the transaction date.

At each reporting date, monetary assets and liabilities expressed in foreign currencies are translated at the closing rate. The resulting foreign exchange differences are taken to the income statement.

## 1.3.6 Related parties

Related parties include the French State, companies in which the State holds majority ownership and certain of their subsidiaries, and companies in which EDF exercises joint control or significant influence. They also include members of the Group's management and governance bodies.

## 1.3.7 Sales

Sales essentially comprise income from energy sales, connections and other services, which mainly include energy transmission and distribution, and capacity and interconnection auctions.

The Group accounts for sales when:

- there is a proven contractual relationship;
- delivery has taken place (or the service has been completed);
- a quantifiable price has been established or can be determined;
- and the receivables are likely to be recovered.

Delivery takes place when the risks and benefits associated with ownership are transferred to the buyer. Energy supplied but not yet measured and billed is calculated based on consumption statistics and selling price estimates.

Sales of goods and revenues on services not completed at the balance sheet date are valued by reference to the stage of completion at that date.

Energy trading operations are recognised net of purchases.

## 1.3.8 Income taxes

Income taxes include the current tax expense (income) and the deferred tax expense (income), calculated under the tax legislation in force in the countries where earnings are taxable.

Current and deferred taxes are recorded in the income statement or in equity if they concern items directly allocated to equity.

The current tax expense (income) is the estimated amount of tax due on the taxable income for the period, calculated using the tax rates adopted at the year-end.

Deferred taxes result from temporary differences between the book value of assets and liabilities and their tax basis. No deferred taxes are recognised for temporary differences generated by:

- goodwill which is not tax deductible;
- the initial recognition of an asset or liability in a transaction which is not a business combination and does not affect the accounting profit or taxable profit (tax loss) at the transaction date;
- investments in subsidiaries, joint ventures and associates, when the Group controls the timing of reversal of the temporary differences, and it is probable that the temporary differences will not reverse in the foreseeable future.



Deferred tax assets and liabilities are valued at the expected tax rate for the period in which the asset will be realised or the liability settled, based on tax rates adopted at the year-end. If the tax rate changes, deferred taxes are adjusted to the new rate and the adjustment is recorded in the income statement, unless it relates to an underlying for which changes in value are recorded in equity, for example in accounting for changes in actuarial gains and losses or fair value on hedging instruments and available-for-sale financial assets.

Deferred taxes are reviewed at each closing date, to take into account changes in tax legislation and the prospects for recovery of deductible temporary differences. Deferred tax assets are only recognised when it is probable that the Group will have sufficient taxable profit to utilise the benefit of the asset in the foreseeable future, or beyond that horizon, if there are deferred tax liabilities with the same maturity.

### 1.3.9 Earnings per share and diluted earnings per share

Earnings per share is calculated by dividing the Group's share of net income by the weighted average number of shares outstanding over the period. This weighted average number of shares outstanding is the number of ordinary shares at the start of the year, adjusted by the number of shares redeemed or issued during the year.

This number, and the earnings per share, is adjusted whenever necessary to reflect the impact of translation or exercise of dilutive potential shares (options, subscription warrants and convertible bonds issued, etc.).

### 1.3.10 Business combinations

The Group has applied revised IFRS 3 since 1 January 2010, and accordingly business combinations arising since that date are recorded under the new acquisition method.

At the date of acquisition, the identifiable assets acquired and liabilities assumed, measured at fair value, and any non-controlling interests in the company acquired (minority interests) are recorded separately from goodwill.

Non-controlling interests may be valued either at fair value (total goodwill method) or their share in the fair value of the net assets of the acquired company (partial goodwill method). The decision is made individually for each transaction.

Any acquisition or disposal of an investment that does not affect control and takes place after the business combination is considered as a transaction between shareholders and must be recorded directly in equity in application of amended IAS 27.

If additional interests in an associate are acquired without resulting in acquisition of control, the value of previously acquired assets and liabilities remains unchanged in the consolidated accounts.

If control is acquired in stages, the cost of the business combination includes the fair value, at the date control is acquired, of the purchaser's previously-held interest in the acquired company.

Related costs directly attributable to an acquisition leading to control are treated as expenses for the periods in which they were incurred, except for issuance costs for debt securities or equity instruments, which must be recorded in compliance with IAS 32 and IAS 39.

Revised IFRS 3 does not apply to common control business combinations, which are examined on a case-by-case basis to determine the appropriate accounting treatment.

### 1.3.11 Goodwill and other intangible assets

#### 1.3.11.1 Goodwill

##### 1.3.11.1.1 Determination of goodwill

Goodwill corresponds to the difference between the cost of a business combination and the Group's share in the fair value of the identifiable assets acquired and liabilities assumed from the company acquired on the date control is transferred. When the difference is negative, it is immediately included in the income statement.

The fair values of assets and liabilities and the resulting goodwill are finalised within twelve months of the acquisition.

##### 1.3.11.1.2 Measurement and presentation of goodwill

Goodwill on acquisition of subsidiaries or joint ventures is disclosed separately in the balance sheet. Impairment on this goodwill is reported under the heading "Impairment" in the income statement.

Goodwill on acquisition of associates is included in the investment's net book value. Impairment on this goodwill is included under the heading "Share in income of associates".

Goodwill is not amortised, but impairment tests are carried out as soon as there is an indication of possible loss of value, and at least annually, as described in note 1.3.15.

After initial recognition, goodwill is carried at cost less any impairment recognised.

#### 1.3.11.2 Other intangible assets

##### 1.3.11.2.1 Research and development expenses

Research expenses are recognised as expenses in the financial period incurred.

Project development expenses are capitalised as an intangible asset if the Group can demonstrate:

- the technical feasibility of making the intangible asset ready for commissioning or sale;
- its intention to complete the intangible asset and use or sell it;
- its ability to use or sell the intangible asset;
- how the intangible asset will generate likely future economic benefits;
- the availability of the appropriate resources (technical, financial or other) to complete development and use or sell the intangible asset;
- its ability to provide a reliable estimate of expenses attributable to the intangible asset during its development.

Capitalised development costs are amortised on a straight-line basis over the foreseeable useful life.

##### 1.3.11.2.2 Other self-produced or purchased intangible assets

Other intangible assets mainly comprise:

- software, which is amortised on a straight-line basis over its useful life;
- purchased brands with an indefinite useful life, or amortised on a straight-line basis over their useful life;
- operating or usage rights for power plants, which are amortised on a straight-line basis over the useful life of the underlying asset;
- rights or licenses relating to hydrocarbon concessions, which are amortised under the Unit Of Production (UOP) method;
- intangible assets related to environmental regulations (greenhouse gas emission rights and renewable energy certificates acquired for a consideration – see note 1.3.27);

- the positive value of energy purchase/sale contracts stated at fair value as part of a business combination governed by revised IFRS 3: this value is amortised as the contractual deliveries take place.

### 1.3.11.2.3 Hydrocarbon prospecting, exploration and generation

The Group applies IFRS 6, "Exploration for and Evaluation of Mineral Resources".

Prospection and exploration costs and costs incurred in connection with geological surveys, exploration tests, geological and geophysical mapping and exploratory drilling are recognised as intangible assets and fully amortised in the year they are incurred.

Development costs related to commercially viable mineral wells and investments in facilities to extract and store hydrocarbons are recognised as "Property, plant and equipment used in generation and other tangible assets owned by the Group" or "Property, plant and equipment operated under concessions for other activities" as appropriate.

They are amortised under the UOP ("Unit Of Production") method.

## 1.3.12 Concession assets, generation assets and other property, plant and equipment

The Group's property, plant and equipment is reported under three balance sheet headings, as appropriate to the business and contractual circumstances of their use:

- property, plant and equipment operated under French public electricity distribution concessions;
- property, plant and equipment operated under concessions for other activities;
- property, plant and equipment used in generation and other tangible assets owned by the Group.

### 1.3.12.1 Initial measurement

Property, plant and equipment is recorded at acquisition or production cost.

The cost of facilities developed in-house includes all labour and materials costs, and all other production costs attributable to the construction cost of the asset.

The Group capitalises safety expenses incurred as a result of legal and regulatory obligations sanctioning non-compliance by an administrative ban from operation.

The cost of property, plant and equipment also includes decommissioning costs for generation plants, and last core costs for nuclear facilities. These assets are associated with the provisions recorded to cover these obligations. At the date of commissioning, they are measured and recorded in the same way as the corresponding provision (see note 1.3.21).

When some of the decommissioning costs for a plant are to be borne by a partner, the expected reimbursement is recognised as accrued income in the assets. The difference between the provision and the accrued income is recorded as a tangible asset, and subsequent payments by the partner are deducted from the accrued income.

The following components are thus included in the balance sheet value of property, plant and equipment:

- the discounted cost of decommissioning the facilities;
- and for nuclear facilities, the discounted cost of last core nuclear fuel, including:
  - the cost of the loss on reactor fuel that will not be fully irradiated when production shuts down and cannot be reused because of technical and regulatory constraints;

- the cost of processing this fuel;
- and the cost of removing and storing waste resulting from these operations.

Strategic safety spare parts for nuclear facilities are treated as property, plant and equipment, and depreciated over the residual useful life of the installations.

When a part of an asset has a different useful life from the overall asset's useful life, it is identified as an asset component and depreciated over a specific period. This mainly concerns the costs of major inspections, which are amortised over a period corresponding to the time elapsing between two inspections.

Borrowing costs attributable to the financing of an asset incurred during the construction period are included in the value of the asset provided it is a "qualifying asset" as defined by IAS 23.

### 1.3.12.2 Depreciation

Items of property, plant and equipment are depreciated on a straight-line basis over their useful life, defined as the period during which the Group expects to draw future economic benefits from their use.

Depending on each country's specific regulations and contractual arrangements, the expected useful lives for the main facilities are as follows:

- hydroelectric dams: 75 years
- electromechanical equipment used in hydropower plants: 50 years
- fossil-fired power plants: 25 to 45 years
- nuclear generation facilities:
  - in France: 40 years
  - outside France: 35 to 60 years
- transmission and distribution installations (lines, substations): 20 to 50 years
- wind farm and photovoltaic facilities: 20 to 25 years

In 2012, the useful life of certain nuclear generation facilities in the United Kingdom was extended by 5 and 7 years.

## 1.3.13 Concession agreements

### 1.3.13.1 Accounting treatment

The accounting treatment of public and private agreements depends on the nature of the agreements and their specific contractual features.

For public agreements concerning contractual services, IFRIC 12, "Service concession arrangements", applied by the EDF Group since 1 January 2010, has a limited impact on the Group's financial statements, since the Group considers for most of its concessions that in substance the grantors do not have the characteristic features of control over infrastructures as defined in IFRIC 12.

### 1.3.13.2 French concessions

In France, the Group is the operator for three types of public service concessions:

- public electricity distribution concessions in which the grantors are local authorities (municipalities or syndicated municipalities);
- hydropower concessions with the State as grantor;
- the public transmission network operated under concession from the State.

### 1.3.13.2.1 Public electricity distribution concessions

#### ■ General background

Since the enactment of the French Law of 8 April 1946, the EDF group has by law been the sole operator for the main public distribution concessions in France.

The accounting treatment of concessions is based on the concession agreements, with particular reference to their special clauses. It takes into consideration the possibility that EDF may one day lose its status as the sole authorised State concession operator.

These agreements cover terms of between 20 and 30 years, and generally use standard concession rules deriving from the 1992 Framework Contract negotiated with the National Federation of Licensing Authorities (*Fédération Nationale des Collectivités Concédantes et Régies - FNCCR*) and approved by the public authorities (updated in 2007).

#### ■ Recognition of assets as property, plant and equipment operated under French public electricity distribution concessions

All assets used by EDF in public electricity distribution concessions in France, whether they are owned by the grantor or the operator, are reported together on a specific line in the balance sheet assets at acquisition cost, or their estimated value at the transfer date when supplied by the grantor.

### 1.3.13.2.2 Hydropower concessions

Hydropower concessions in France follow standard rules approved by decree. Assets attributed to the hydropower concessions comprise hydropower generation equipment (dams, pipes, turbines, etc) and, in the case of recently-renewed concessions, electricity generation and switching facilities (alternators, etc).

Assets used in these concessions are recorded under "Property, plant and equipment operated under concessions for other activities" at acquisition cost. As a result of changes in the regulations following removal of the outgoing operator's preferential right when a concession is renewed, the Group has shortened the depreciation periods used for certain assets.

### 1.3.13.2.3 Public transmission concession

Under French law, assets assigned to the public transmission concession belong to RTE Réseau de Transport d'Électricité (RTE). Following application of the equity method to RTE from 31 December 2010, these assets are included in calculating the equity value of RTE in the Group's consolidated balance sheet.

### 1.3.13.2.4 Foreign concessions

Foreign concessions are governed by a range of contracts and national laws. Most assets operated under foreign concessions are recorded under "Property, plant and equipment operated under concessions for other activities". Foreign concessions chiefly concern Edison in Italy, which operates hydrocarbon generation sites, gas storage sites, local gas distribution networks and hydropower generating plants under concessions. Edison owns all the assets except for some items of property, plant and equipment on the hydropower generation sites, which will be returned to the grantor for nil consideration or with an indemnity when the concession ends. In compliance with IFRIC 12, certain concession agreements are recorded as intangible assets.

Hydropower generation assets which will be returned for nil consideration at the end of the concession are depreciated over the duration of the concession. Hydrocarbon generation sites are recorded in compliance with the rules applicable to the sector (see note 1.3.11).

## 1.3.14 Leases

In the course of its business the Group uses assets made available to it, or makes assets available to lessees, under lease contracts. These contracts

are analysed in the light of the situations described and indicators supplied in IAS 17 in order to determine whether they are finance leases or operating leases.

### 1.3.14.1 Finance leases

Contracts that effectively transfer virtually all risks and benefits inherent to ownership of the leased item are classified as finance leases. The main criteria examined in determining whether virtually all the risks and benefits are transferred by an agreement are the following:

- the ratio of the duration of the lease to the leased assets' useful life;
- total discounted future payments as a ratio of the fair value of the financed asset;
- whether ownership is transferred at the end of the lease;
- whether the purchase option is attractive;
- the features specific to the leased asset.

Assets used under finance leases are derecognised from the lessor's balance sheet and included in the relevant category of property, plant and equipment in the lessee's accounts. Such assets are depreciated over their useful life, or the term of the lease contract when this is shorter.

A corresponding financial liability is booked by the lessee, and a financial asset by the lessor.

If the Group performs a sale and leaseback operation resulting in a finance lease agreement, this is recognised in accordance with the principles described above. If the transfer price is higher than the asset's book value, the surplus is deferred and recognised as income progressively over the term of the lease.

### 1.3.14.2 Operating leases

Lease agreements that do not qualify as finance leases are classified and recognised as operating leases. Rental charges are spread over the duration of the lease agreement on a straight-line basis.

### 1.3.14.3 Arrangements containing a lease

In compliance with IFRIC 4, the Group identifies arrangements that do not have the legal form of a lease contract but nonetheless convey the right to use an asset or group of specific assets to the purchaser, as the purchaser in the arrangement benefits from a substantial share of the asset's production and payment is not dependent on production or market price.

Such arrangements are treated as leases, and analysed with reference to IAS 17 for classification as either finance or operating leases.

## 1.3.15 Impairment of goodwill, intangible assets and property, plant and equipment

At the year-end and at each interim reporting date, the Group assesses whether there is an indication that an asset could have been significantly impaired. An impairment test is also carried out at least once a year on cash-generating units (CGUs) or groups of CGUs including goodwill or any intangible asset with an indefinite useful life.

For CGUs including goodwill or another non-amortisable intangible asset, or when there is evidence of loss of value, an impairment test is carried out as follows:

- The Group measures any long-term asset impairment by comparing the carrying value of these assets and goodwill, classified into cash-generating units where necessary, and their recoverable amount. Cash-generating units (CGUs) are groups of homogeneous assets that generate identifiable independent cash flows. The Group's CGUs are

subgroups or legal entities, broken down where necessary by activity (generation and supply, distribution, transmission, other). Goodwill is allocated to the CGUs that benefit from synergies resulting from the acquisition.

The recoverable value of these units is the higher of fair value net of disposal costs, and value in use. Value in use is determined with reference to discounted future net cash flows based on medium-term financial projections. When this recoverable value is lower than the carrying amount in the balance sheet, an amount equal to the difference is booked under the heading "Impairment". The loss is allocated first to goodwill, and any surplus to the other assets of the CGU concerned.

- The discount rates used for these purposes are based on the weighted average cost of capital for each asset or group of assets concerned, determined by economic and geographical area and by business segment where appropriate. The pre-tax discount rate is calculated using an iterative process based on after-tax rates.
- Future cash flows are based on medium-term plan projections over at least three years, and assumptions validated by the Group. Variables that can significantly affect the calculations are:
  - changes in tariff regulations and market prices;
  - changes in interest rates and market risk premiums;
  - market levels, the market share for supplies, and the level of investment;
  - the useful lives of facilities, and the plan for concession renewal;
  - the growth rates used beyond the medium-term plans and the terminal values taken into consideration.
- The fair value net of disposal costs is measured on the basis of multiples observed for the most recent transactions in the relevant sector.

Impairment of goodwill is irreversible.

### 1.3.16 Financial assets and liabilities

Financial assets include available-for-sale assets (non-consolidated investments, investment securities and certain dedicated assets), loans and receivables at amortised cost, including trade receivables, and the positive fair value of derivatives.

Available-for-sale securities allocated to dedicated assets are presented in note 48.

Financial liabilities comprise loans and other financial liabilities, trade payables, bank credit and the negative fair value of financial derivatives.

Financial assets and liabilities are recorded in the balance sheet as current if they mature within one year and non-current if they mature after one year, apart from derivatives held for trading, which are all classified as current.

Operating debts and receivables, and cash and cash equivalents, are governed by IAS 39 and reported separately in the balance sheet.

#### 1.3.16.1 Classification and valuation methods for financial assets and liabilities

Financial instruments are classified as follows under IFRS 7:

- financial assets and liabilities carried at fair value with changes in fair value included in income;
- held-to-maturity financial assets;
- loans and financial receivables;
- available-for-sale financial assets;
- trade receivables;
- cash and cash equivalents;

- financial debts and operating debts;
- derivatives.

Financial instruments stated at fair value are classified in the following categories:

- level 1 (quoted prices): financial instruments listed on an active market;
- level 2 (observable data): financial instruments valued using valuation techniques based on observable parameters;
- level 3 (internal model): financial instruments valued using valuation techniques based wholly or partly on non-observable parameters.

#### 1.3.16.1.1 Financial assets and liabilities carried at fair value with changes in fair value included in income

Financial assets carried at fair value with changes in fair value included in the income statement are classified as such at the inception of the operation. This applies to:

- assets acquired from the outset with the intention of resale in the short term;
- or derivatives not classified as hedges (derivatives held for trading);
- or assets the Group has elected to include in this category under the option allowed by IAS 39.

These assets are recorded at the transaction date at fair value, which is generally equal to the amount of cash paid out. Transaction costs directly attributable to the acquisition are recorded in the income statement. At each subsequent reporting date they are adjusted to fair value, based on quoted prices available from external sources for listed financial instruments, or using recognised valuation techniques such as the discounted cash flow method or reference to external sources for other financial instruments.

Changes in fair value other than those concerning commodity contracts are recorded in the income statement under the heading "Other financial income and expenses".

Dividends and interest received on assets carried at fair value are recorded in the income statement under "Other financial income".

Changes in the fair value of commodity trading contracts are recorded in the income statement under "Sales".

Changes in the fair value of non-trading commodity transactions are reported separately on a specific line of the income statement, "Net changes in fair value on Energy and Commodity derivatives, excluding trading activities" below the operating profit before depreciation and amortisation. These are transactions that come under the scope of IAS 39, which for accounting purposes are not eligible for hedge accounting or the IAS 39 "own use" exemption (see note 1.3.16.1.6).

Regarding the fair value option, the Group classifies an asset or liability "at fair value with changes in fair value included in income" in the three following circumstances:

- when using fair value eliminates or significantly reduces an inconsistency in the measurement of assets and liabilities;
- when the performance of a group of financial assets or financial liabilities is managed on a fair value basis, in accordance with documented strategies and the reporting to management;
- when a contract contains one or more embedded derivatives. In such cases the fair value option may be applied to the hybrid instrument, unless:
  - the embedded derivative does not substantially affect the cash flows of the contract,
  - analysis of the host contract and the embedded derivative does not lead to separation of this embedded derivative.



### 1.3.16.1.2 Held-to-maturity financial assets

This category covers fixed-term investments which the Group acquires with the intent and ability to hold to maturity. They are recorded at amortised cost at the transaction date. Interest is calculated at the effective interest rate and recorded in the income statement under the heading "Other financial income and expenses".

### 1.3.16.1.3 Loans and financial receivables

Loans and financial receivables are valued and recorded at the transaction date, at amortised cost less any impairment.

Interest is calculated at the effective interest rate and recorded in the income statement under the heading "Other financial income and expenses".

### 1.3.16.1.4 Available-for-sale financial assets

Available-for-sale financial assets comprise non-consolidated investments, investment securities, reserved funds and certain dedicated assets.

On initial recognition, available-for-sale financial assets are recorded at fair value plus transaction costs attributable to their acquisition. They are subsequently readjusted to fair value at each reporting date.

Fair value measurement is based on quoted prices and market data available from external sources for instruments listed on an active market, and on the discounted cash flow method for other financial instruments. Shares not listed on an active market for which fair value cannot be reliably estimated are recorded at acquisition cost.

Unrealised gains or losses on these assets are recorded in equity, unless there is evidence of a realised loss, in which case impairment is recognised in the financial result (see note 1.3.16.2.2).

For available-for-sale financial assets represented by debt securities, interest income is calculated at the effective interest rate and credited to the income statement under the heading "Other financial income and expenses".

### 1.3.16.1.5 Financial liabilities

Financial liabilities are recorded at amortised cost, with separation of embedded derivatives where applicable. Interest expenses are calculated at the effective interest rate and recorded in the income statement under the heading "Cost of gross financial indebtedness" over the duration of the financial liability.

### 1.3.16.1.6 Derivatives

#### ■ Scope

The scope of derivatives applied by the Group corresponds to the principles set out in IAS 39.

In particular, forward purchases and sales for physical delivery of energy or commodities are considered to fall outside the scope of application of IAS 39 when the contract concerned is considered to have been entered into as part of the Group's normal business activity ("own use"). This is demonstrated to be the case when all the following conditions are fulfilled:

- a physical delivery takes place under all such contracts;
- the volumes purchased or sold under the contracts correspond to the Group's operating requirements;
- the contracts cannot be considered as options as defined by the standard. In the specific case of electricity sale contracts, the contract is equivalent to a firm forward sale or can be considered as a capacity sale.

The Group thus considers that transactions negotiated with a view to balancing the volumes between electricity purchase and sale commitments are part of its business as an integrated electricity operator, and are outside the scope of IAS 39.

In compliance with IAS 39, the Group analyses all its contracts, of both a financial and non-financial nature, to identify the existence of any "embedded" derivatives. Any component of a contract that affects the cash flows of that contract in the same way as a stand-alone derivative corresponds to the definition of an embedded derivative.

If they meet the conditions set out by IAS 39, embedded derivatives are accounted for separately from the host contract at inception date.

#### ■ Measurement and recognition

Derivatives are initially recorded at fair value, based on quoted prices and market data available from external sources. If no quoted prices are available, the Group may refer to recent comparable transactions or if no such transactions exist base its valuation on internal models that are recognised by market participants, giving priority to information directly derived from observable data, such as over-the-counter listings.

Changes in the fair value of these derivatives are recorded in the income statement, unless they are classified as hedges for a cash flow or net investment. Changes in the fair value of such hedging instruments are recorded directly in equity, excluding the ineffective portion of the hedge.

In the specific case of financial instruments entered into as part of the trading business, realised and unrealised gains and losses are reported net under the heading "Sales".

#### ■ Derivatives classified as hedges

The EDF group uses derivatives to hedge its foreign exchange and interest rate risks, as well as risks related to certain commodity contracts.

The Group applies the criteria defined by IAS 39 in classifying derivatives as hedges:

- the instrument must hedge changes in fair value or cash flows attributable to the risk hedged, and the effectiveness of the hedge (i.e. the degree to which changes in the value of the hedging instrument offset changes in the value of the hedged item or future transaction) must be between 80% and 125%;
- in the case of cash flow hedges, the future transaction being hedged must be highly probable;
- reliable measurement of the effectiveness of the hedge must be possible;
- the hedge must be supported by appropriate documentation from its inception.

The hedging relationship ends when:

- a derivative ceases to be an effective hedging instrument;
- a derivative expires, or is sold, terminated or exercised;
- the hedged item expires, is sold or redeemed;
- a future transaction ceases to be considered as highly probable.

Only derivatives external to the Group, and internal derivatives that are matched with similar transactions external to the Group, qualify for hedge accounting.

The Group uses the following categories for hedges:

#### (A) Fair value hedges

These instruments hedge the exposure to changes in the fair value of an asset or liability recorded in the balance sheet, or a firm commitment to purchase or sell an asset. Changes in the fair value of the hedged item attributable to the hedged component of that item are recorded in the income statement and offset by corresponding variations in the fair value of the hedging instrument. Only the ineffective portion of the hedge has an impact on income.



### **(B) Cash flow hedges**

These instruments hedge highly probable future transactions: the variability in cash flows generated by the hedged transaction is offset by changes in the value of the hedging instrument.

The effective portion of accumulated changes in the hedge's fair value is recorded in equity, and the ineffective portion (i.e. changes in the fair value of the hedging instrument in excess of changes in the fair value of the hedged item) is recorded in the income statement.

When the hedged cash flows materialise, the amounts previously recognised in equity are transferred to the income statement in the same way as for the hedged item.

### **(C) Hedges of a net investment**

These instruments hedge exposure to the foreign exchange risk related to a net investment in a foreign entity. The effective portion of accumulated changes in the hedge's fair value is recorded in equity until disposal of the net investment, when it is included in the gain or loss on disposal. The ineffective portion (defined in the same way as for cash flow hedges) is recorded directly in the income statement.

The Group records the change in fair value resulting from the interest rate effect of derivatives hedging a net investment in a foreign operation in equity in the same way as the change in value resulting from foreign exchange differences.

### **1.3.16.2 Impairment of financial assets**

At the year-end and at each interim reporting date, the Group assesses whether there is any objective evidence that an asset could have been significantly impaired. If so, the Group estimates the asset's recoverable value and records any necessary impairment as appropriate for the category of asset concerned.

#### **1.3.16.2.1 Financial assets recorded at amortised cost**

Impairment is equal to the difference between the asset's net book value and the discounted value of expected future cash flows, using the original effective interest rate of the financial instrument. The impairment is included in the income statement under the heading "Other financial income and expenses". If the impairment loss decreases in a subsequent period, the amount of the decrease is reversed and transferred to the income statement.

#### **1.3.16.2.2 Available-for-sale financial assets**

If there is a substantial, long-term decline in the fair value of available-for-sale assets, the unrealised loss is reclassified from equity to income. For debt instruments, impairment is only recorded in income when there is an indication of impairment associated with the counterparty. If the fair value of an available-for-sale financial asset rises in a subsequent period, the increase in value is included in equity when it concerns equity instruments, and leads to a reversal from previously-recorded impairment when it concerns debt instruments.

Different criteria for impairment apply to different types of available-for-sale financial assets.

For available-for-sale financial assets (other than dedicated assets) held by controlled companies, the Group generally uses the following criteria to assess impairment:

- 3 years as the threshold for assessment of long-term loss of value,
- a 50% decline from historical cost as indication of a significant loss of value.

For available-for-sale financial assets held as part of EDF's dedicated asset portfolio, the Group uses the following criteria to assess impairment:

- a 5-year period as the threshold for assessment of a long-term loss of value,

- a 40% decline from historical portfolio value as indication of a significant loss of value.

In assessing impairment of dedicated assets, the Group takes into consideration factors specific to their nature: legal and regulatory obligations associated with the funds concerned, the timing of the payments they are to finance, and long-term management of the funds.

### **1.3.16.3 Derecognition of financial assets and liabilities**

The Group derecognises a financial asset when:

- the contractual rights to the cash flows generated by the asset expire, or
- the Group transfers the rights to receive contractual cash flows related to the financial asset through the transfer of substantially all of the risks and benefits associated with ownership of the asset.

Any interest created or retained by the Group in transferred financial assets is recorded as a separate asset or liability.

The Group derecognises a financial liability when its contractual obligations are extinguished, cancelled or expire. When a debt is renegotiated with a lender on substantially different terms, a new liability is recognised.

### **1.3.16.4 Securitisation operations**

When it can be demonstrated that the Group has transferred substantially all the risks and benefits related to transfers of receivables, particularly the credit risk, the items concerned are derecognised.

Otherwise, the operation is considered as a financing operation, and the receivables remain in the balance sheet assets, with recognition of a corresponding financial liability.

## **1.3.17 Inventories**

Inventories are recognised at the lower of acquisition cost or net realisable value, except for inventories held for trading activities, which are carried at market value. The cost of inventories is determined by the weighted average unit cost method.

Cost includes all direct material costs, labour costs, and a share of indirect production costs.

### **1.3.17.1 Nuclear fuel and materials**

Inventory accounts include:

- nuclear materials, whatever their form during the fuel production cycle,
- fuel components in the warehouse or in the reactor.

The stated value of nuclear fuel and materials and work-in-progress is determined based on direct processing costs including materials, labour and subcontracted services (e.g. fluorination, enrichment, production, etc).

In accordance with regulatory obligations specific to each country, inventories of fuel (new or not entirely consumed) may also comprise expenses for spent fuel management and long-term radioactive waste management, with corresponding provisions or debts in the liabilities, or full and final payments made when the fuel is loaded.

Interest expenses incurred in financing inventories of nuclear fuels with a short-term production process are charged to expenses for the period.

Nuclear fuel consumption is determined as a proportion of the expected output when the fuel is loaded in the reactor. These quantities are valued at weighted average cost of inventories. Inventories are periodically corrected in view of forecast spent quantities based on neutronic measurements and physical inventories.

### 1.3.17.2 Other operating inventories

Other non-trading operating inventories are generally valued at weighted average cost including direct and indirect purchasing costs. Inventories held for trading are carried at market value.

Impairment of spare parts supplied under a maintenance programme depends on the turnover of these parts and the useful lives of the generation units.

Certificates issued under the various environmental schemes are also included in other inventories (see note 1.3.27).

### 1.3.18 Trade receivables

Trade receivables are initially recognised at the fair value of the consideration received or receivable. Impairment is recorded when, based on the probability of recovery assessed according to the type of receivable, their carrying amount falls below their book value. Depending on the nature of the receivable, the risk associated with doubtful receivables is assessed individually or by experience-based statistical methods.

Trade receivables also include the value of unbilled receivables for energy already supplied.

### 1.3.19 Cash and cash equivalents

Cash and cash equivalents comprise very liquid assets and very short-term investments, usually maturing within three months or less of the acquisition date, and with negligible risk of fluctuation in value.

Securities held short-term and classified as "Cash equivalents" are recorded at fair value, with changes in fair value included in the heading "Financial income on cash and cash equivalents".

### 1.3.20 Equity

#### 1.3.20.1 Fair value adjustment of financial instruments

The fair value adjustment of financial instruments results from the restatement to fair value of available-for-sale financial assets and certain hedging instruments.

#### 1.3.20.2 Share issue expenses

Share issue expenses correspond exclusively to external costs expressly related to the capital increase. They are charged against the issue premium at their net-of-tax value.

Other expenses are classified as expenses of the period.

#### 1.3.20.3 Treasury shares

Treasury shares are shares issued by the consolidating company and held either by that company or by other entities in the consolidated Group. They are valued at acquisition cost and deducted from equity until the date of disposal. Net gains or losses on disposals of treasury shares are directly included in equity and do not affect net income.

### 1.3.21 Provisions other than employee benefit provisions

The Group recognises provisions if the following three conditions are met:

- the Group has a present obligation (legal or constructive) towards a third party that arises from an event prior to the closing date;

- it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation;
- the obligation amount can be estimated reliably.

Provisions are determined based on the Group's estimate of the expected cost necessary to settle the obligation. Estimates are based on management data from the information system, assumptions adopted by the Group, and if necessary experience of similar transactions, or in some cases based on independent expert reports or contractor quotes. The various assumptions are reviewed for each closing of the accounts.

Provisions mainly cover the following:

- back-end nuclear cycle expenses: provisions for spent fuel management and long-term radioactive waste management are established in accordance with the obligations and final contributions specific to each country;
- costs for decommissioning power plants and losses relating to fuel in the reactor when the reactor is shut down (provision for last cores);
- future losses relating to multi-year agreements for the purchase and sale of energy:
  - losses on energy purchase agreements are measured by comparing the acquisition cost under the contractual terms with the forecast market price;
  - losses on energy sale agreements are measured by comparing the estimated income under the contractual terms with the cost of the energy to be supplied.

Provisions to cover back-end nuclear cycle expenses, expenses related to the decommissioning of power plants and last cores, and future losses relating to multi-year energy purchase and sale agreements are estimated based on discounted future cash flows.

The rate of inflation and the discount rate are based on the economic and regulatory parameters of the country where the economic entity is located.

The discount effect generated at each closing to reflect the passage of time is recorded under "Discount effect" in financial expenses.

A change in provisions resulting from a change in discount rates, a change in the disbursement schedule or a change in contractor quote are recorded:

- as a change in the corresponding assets if the provision was initially covered by balance sheet assets (decommissioning of plants still in operation, long-term management of the radioactive waste resulting from such decommissioning, and last cores);
- in the income statement in all other cases.

In extremely rare cases, description of a specific litigation covered by a provision may be omitted from the notes to the financial statements if such disclosure could cause serious prejudice to the Group.

If it is anticipated that all or part of the expenses covered by a provision will be reimbursed, the reimbursement is recognised under receivables if and only if the Group is virtually certain of receiving it.

In extremely rare situations, a provision cannot be booked due to lack of a reliable estimate. In such unusual cases, the obligation is mentioned in the notes as a contingent liability, unless there is little likelihood of an outflow of resources.

### 1.3.22 Provisions for employee benefits

The Group grants its employees post-employment benefits (pension plans, retirement indemnities, etc) and other long-term benefits (e.g. long-service awards) in compliance with the specific laws and measures in force in each country where it does business.

### 1.3.22.1 Calculation and recognition of employee benefits

Obligations under defined-benefit plans are calculated by the projected unit credit method, which determines the present value of entitlements earned by employees at year-end under all types of plan, taking into consideration each country's specific economic conditions and expected wage increases.

For post-employment benefit obligations, this method takes the following factors into consideration:

- career-end salary levels, with reference to employee seniority, projected salary levels at the time of retirement based on the expected effects of career advancement, and estimated trends in pension levels;
- retirement age, determined on the basis of relevant factors (such as years of service and number of children, taking into account the longer employee contribution period to qualify for a full pension);
- forecast numbers of pensioners, determined based on employee turnover rates and mortality data available in each country;
- reversion pensions where relevant, taking into account both the life expectancy of the employee and his/her spouse and the marriage rate observed for the population of IEG (electricity and gas sector) status employees;
- a discount rate that depends on the geographical zone and the duration of the obligations; in compliance with IAS 19, this rate is determined as the market yield on high-quality corporate bonds or the year-end rate on government bonds with a similar duration to EDF's commitments to employees.

The provision reflects the value of the fund assets that cover post-employment obligations, which is deducted from the value of the benefit obligation.

Actuarial gains and losses on post-employment benefits generated by changes in actuarial assumptions (discount rate, mortality rate, retirement age, etc) are recognised immediately in the statement of net income and gains and losses recorded directly in equity, in application of the option allowed by IAS 19 (2008).

For other long-term benefits, actuarial gains and losses and the full past service cost are directly included in the provision.

The net expense booked during the year for employee benefit obligations includes:

- the net cost of additional vested benefits, and the financial discount cost on existing benefits;
- the income corresponding to the expected return on fund assets;
- the income or expense related to amendments/terminations of benefit plans or introduction of new plans;
- the change in actuarial gains and losses relating to long-term benefits.

### 1.3.22.2 Post-employment benefit obligations

When they retire, Group employees benefit from pensions determined under local rules. They may also be entitled to benefits directly paid by the companies, and additional benefits prescribed by the relevant regulations.

#### 1.3.22.2.1 French subsidiaries covered by the IEG system

Subsidiaries belonging to the specific IEG (electricity and gas) sector system, namely EDF, ERDF, RTE Réseau de Transport d'Électricité (RTE), Électricité

de Strasbourg and certain subsidiaries of the Tiru subgroup, are Group companies where almost all employees benefit from the IEG statutes, including the special pension system and other statutory benefits.

Since the financing reform for the IEG sector system took effect on 1 January 2005, the CNIIEG (*Caisse Nationale des IEG*, the sector's specific pension body) has managed not only the special IEG pension system, but also the industrial accident, invalidity and death insurance system for the sector.

The CNIIEG is a social security body governed by private law, formed by the law of 9 August 2004. It has legal entity status and reports to the French government, operating under the joint supervision of France's ministers for the Budget, Social Security and Energy. Under the funding arrangements introduced by the law, IEG companies establish pension provisions to cover entitlements not funded by France's standard systems (CNAV, AGIRC and ARRCO), to which the IEG system is affiliated, or by the CTA (*Contribution Tarifaire d'Acheminement*) levy on gas and electricity transmission and distribution services.

The provision for pensions thus includes:

- specific benefits of employees in the deregulated or competitive activities;
- specific benefits earned by employees from 1 January 2005 for the regulated activities (transmission and distribution) (past benefits are financed by the CTA levy);
- specific benefits of employees benefiting from early retirement before the standard legal retirement age.

CNIIEG management expenses payable by EDF for the administration and payment of retired employees' pensions are also included.

In addition to pensions, other benefits are granted to IEG status former employees (not currently in active service), as detailed below:

- Benefits in kind: article 28 of the IEG national statutes entitles such employees and current employees to benefits in kind in the form of supplies of electricity or gas at the preferential "employee price". The EDF group's obligation for supplies of energy to EDF and GDF SUEZ employees corresponds to the probable present value of kWhs supplied to beneficiaries during their retirement, valued on the basis of the unit cost, taking into account the payment received under the energy exchange agreement with GDF SUEZ.
- Retirement gratuities: these are paid upon retirement to employees due to receive the statutory old-age pension, or to their dependants if the employee dies before reaching retirement. These obligations are almost totally covered by an insurance policy.
- Bereavement benefit: this is paid out upon the death of an inactive or disabled employee, in order to provide financial assistance for the expenses incurred at such a time (Article 26 -§ 5 of the National Statutes). It is paid to the deceased's principal dependants (statutory indemnity equal to three months' pension) or to a third party that has paid funeral costs (discretionary indemnity equal to the costs incurred).
- Bonus pre-retirement paid leave: all employees eligible to benefit immediately from the statutory old-age pension and aged at least 55 at their retirement date are entitled to 18 days of bonus paid leave during the last twelve months of their employment.
- Other benefits include cost of studies indemnities, additional retirement indemnities, time banking for pre-retirement leave, and pensions for personnel sent on secondment to subsidiaries not covered by the IEG system.

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## 1.3.22.2.2 French and foreign subsidiaries not covered by the special IEG system

Pension obligations principally relate to the British, US and Belgian companies and are mostly covered by defined-benefit plans.

## 1.3.22.3 Other long-term benefit obligations

These benefits concern employees currently in service, and are earned according to local regulations, particularly the statutory regulations for the electricity and gas sector for EDF and French subsidiaries covered by the IEG regime. They include:

- annuities following incapacity, invalidity, industrial accident or work-related illness; like their counterparts in the general national system, IEG employees are entitled to financial support in the event of industrial accident or work-related illness, and invalidity and incapacity annuities and benefits. The obligation is measured as the probable present value of future benefits payable to current beneficiaries, including any possible reversions;
- long-service awards;
- specific benefits for employees who have been in contact with asbestos.

## 1.3.23 Share-based payments

Under existing legislation in France, employees of a French group may benefit from attribution of shares. When the State sells some of the capital of a public company, article 11 of the French privatisation law of 1986 and article 26 of the law of 9 August 2004 require a share offer to be reserved for current and retired employees of the company. The company being privatised may also set up free share plans.

In the light of IFRS 2, these benefits granted to employees and former employees must be treated by the company as personnel expenses in the same way as additional remuneration, and recognised as such with a corresponding adjustment in equity.

Valuation of the benefit granted through a share offer reserved for current and former employees is based on the difference between the share subscription price and the share price at the grant date, with actuarial valuation of the impact, if any, of the payment terms, the minimum holding period, and the fact that no dividends were received during the vesting period for the free shares.

In the case of free shares, the value of the benefit is based on the share price at the grant date, depending on the number of shares granted and the fact that no dividends were received during the vesting period. The expense is spread over the vesting period.

## 1.3.24 Special concession liabilities

These liabilities represent the contractual obligations specific to the concession rules for public electricity distribution concessions in France, recognised in the liabilities as:

- rights in existing assets: these correspond to the grantor's right to recover all assets for nil consideration. This right comprises the value in kind of the facilities – the net book value of assets operated under concession – less any as yet unamortised financing provided by the operator;
- rights in assets to be replaced: these correspond to the operator's obligation to contribute to the financing of assets due for replacement. These non-financial liabilities comprise:
  - depreciation recorded on the portion of assets financed by the grantor;
  - the provision for renewal, exclusively for assets due for renewal before the end of the concession.

When assets are replaced, the provision and amortisation of the grantor's financing recorded in respect of the replaced item are eliminated and transferred to the rights in existing assets, since they are considered as the grantor's financing for the new asset. Any excess provision is taken to income.

During the concession, the grantor's rights in assets to be replaced are thus transferred upon the asset's renewal to become the grantor's rights in existing assets, with no outflow of cash to the benefit of the grantor.

In general, the value of special concession liabilities is determined as follows:

- the grantor's rights in existing assets, representing the share deemed to be held by the grantor in the concession assets, are valued on the basis of the assets recorded in the balance sheet;
- the obligations relating to assets to be replaced are valued on the basis of the estimated value of the relevant assets, measured at each year-end taking into consideration wear and tear on the asset at that date:
  - based on the difference between the asset's replacement value as assessed at year-end and the historical cost for calculation of the provision for renewal. Annual allocations to the provision are based on this difference, less any existing provisions, with the net amount spread over the residual useful life of the assets. Consequently, the expenses recognised for a given item increase over time,
  - based on the share of the asset's historical cost financed by the grantor for amortisation of the grantor's financing.

The Group considers that the obligations related to assets to be replaced are to be valued on the basis of the special clauses contained in the concession agreements. Under this approach, these obligations are stated at the value of the contractual obligations as calculated and reported annually in the reports to the grantors.

If no such clauses existed, an alternative approach would be to state contractual obligations at the present value of future payments required for replacement of assets operated under concession at the end of their industrial useful life.

For information, the Group reports below the impacts of this alternative approach, i.e. the discounting of the future obligation to contribute to financing of assets to be replaced.

The principal assumptions used in preparing this simulation are as follows:

- the basis for calculation of the provision for renewal is the estimated replacement value at the end of the asset's useful life, applying a forecast annual inflation rate of 2%, less the asset's historical value. This amount is based on the wear and tear on the asset and discounted at a rate of 5%;
- amortisation of the grantor's financing is also discounted at the rate of 5%.

The following table shows the impacts of this discounting for EDF and ERDF in 2012:

- Impacts on the income statement:

<i>(in millions of Euros and before taxes)</i>	<b>2012</b>
Operating profit	455
Financial result	(575)
Income before taxes of consolidated companies	(120)

- Impacts on the balance sheet - equity:

<i>(in millions of Euros and before taxes)</i>	<b>2012</b>
At opening date	2,440
At closing date	2,320

Valuation of concession liabilities under this method is subject to uncertainty over costs and disbursements, and is also sensitive to inflation and discount rates.



### 1.3.25 Investment subsidies

Investment subsidies received by Group companies are included in liabilities under the heading "Other current liabilities" and transferred to income as and when the economic benefits of the corresponding assets are utilised.

### 1.3.26 Assets classified as held for sale and associated liabilities, and discontinued operations

Assets that qualify as held for sale and associated liabilities are disclosed separately from other assets and liabilities in the balance sheet.

All income from discontinued operations is disclosed in a single net amount after taxes in the income statement. In the cash flow statement, net changes in cash and cash equivalents of discontinued activities are also reported separately on a specific line.

Impairment is booked when the realisable value is lower than the net book value.

### 1.3.27 Environment

#### 1.3.27.1 Greenhouse gas emission rights

Since no IFRS specifically addresses the question, the Group has opted for the "net approach" accounting treatment: only purchases and sales of emission rights are recognised in the accounts, and a provision is booked if the entity expects to have an annual shortfall in emission rights.

The Group thus applies the following principles:

- purchased emission rights are recorded as intangible assets at acquisition cost; when they have been granted for nil consideration by the relevant State under the National Allocation Plan, they are not shown in the balance sheet (considered to have nil value);
- when a Group entity's actual emissions for the year are higher than the rights allocated by the State less completed transactions not subject to forward sale for rights still held in respect of that year, a provision is recorded to cover the excess emissions. This provision is equivalent to the acquisition cost up to the amount of rights acquired on the spot or forward markets, and based on market prices for the balance. The provision is cancelled when rights are surrendered to the State.

If the number of purchased emission rights recorded as intangible assets at the end of the year and not subject to forward sale is higher than the number of purchased rights that will be surrendered to the State for the year, an impairment test must be applied to the excess. If there is a significant negative differential on the purchased rights held, impairment must be booked, or partly or totally reversed where relevant.

Forward purchases/sales of emission rights carried out as part of trading activities are recorded in compliance with IAS 39 and stated at fair value at the balance sheet date. Changes in fair value are taken to the income statement.

#### 1.3.27.2 Renewable energy certificates

Electricity produced from renewable energy sources (green energy) is measured in two ways:

- at the sale price, including costs associated with generation of this electricity;
- at the value of renewable energy certificates obtained.

The renewable energy certificate system thus applies to:

- non-obligated producers (because the obligation concerns energy sales: Poland, EDF Énergies Nouvelles);
- obligated producers (because the obligation concerns energy generation, or because they also sell energy and are subject to an energy sale obligation: Edison, Fenice, EDF Luminus, EDF Energy).

The EDF Group applies the following accounting treatments:

- for non-obligated electricity producers, certificates obtained based on generation output are recorded in "Other inventories" until they are sold on to suppliers;
- for obligated producers and an entity that both produces and supplies energy and is under an obligation to sell a specified quantity of renewable energy, the Group uses the following accounting treatments for certificates obtained based on generation output:
  - up to the level of the obligation, these certificates are not recognised,
  - certificates in excess of the obligation are recorded in "Other inventories",
  - in the specific situation when an entity is not in a position to meet its obligation at the year-end, the Group applies the following accounting treatment:
    - certificates acquired for a consideration in order to meet the obligation are recorded in intangible assets at acquisition cost; and
    - a provision is established equivalent to the shortfall in certificates compared to the obligation at the year-end. The value of this provision is based on the acquisition price of certificates already purchased on the spot or forward market, and market prices or penalty prices for the balance. The provision is cancelled when the certificates are surrendered to the State.

Forward purchases/sales of certificates related to trading activities are recorded in accordance with IAS 39, stated at fair value at the balance sheet date. The change in fair value is recorded in the income statement.

#### 1.3.27.3 Energy savings certificates

In the general framework of an energy savings certificates system (of the kind introduced by the French law of 13 July 2005) EDF fulfils its obligations either by taking measures regarding its assets or action with its final customers that entitle it to energy savings certificates from the State, or by purchasing energy savings certificates directly.

Expenses incurred to meet a cumulative energy savings obligation are treated as:

- property, plant and equipment if the action taken by the entity concerns its own assets and the expenses qualify for recognition as an asset;
- expenses for the year incurred, if they do not meet the requirements for capitalisation or if the action taken is to encourage third parties to save energy;
- expenses incurred in excess of the cumulative obligation at the year-end are included in inventories until they are utilised to cover EDF's obligation.

Energy savings certificates acquired for resale are recorded as intangible assets.

#### 1.3.27.4 Environmental expenses

Environmental expenses are identifiable expenses incurred to prevent, reduce or repair damage to the environment that has been or may be caused by the Group as a result of its activities. These expenses are treated as follows:

- they are capitalised if they are incurred to prevent or reduce future damage or protect resources;
- they are booked as environmental liabilities and increases to provisions for environmental risks if they correspond to an obligation that exists at the year-end and it is probable or certain at the reporting date that they will lead to an outflow of resources representing economic benefits;
- they are recognised as expenses if they are operating expenses for the bodies in charge of environmental concerns, environmental supervision, environmental duties and taxes, processing of liquid and gas effluents and non-radioactive waste, or research unrelated to an investment.



## ➤ Note 2. Comparability

### 2.1 Change in recognition of actuarial gains and losses related to post-employment benefits

Since 1 January 2012, the Group has recorded actuarial gains and losses related to post-employment defined benefit plans in the statement of net income and gains and losses recorded directly in equity, under the option allowed by IAS 19.

The Group has thus stopped using the "corridor" method and now recognises all actuarial gains and losses in full.

As this is a change of accounting method, comparative prior year figures resulting from retrospective application of this method are presented in compliance with IAS 8.

The impact on equity (EDF share) amounts to €(1,671) million at 1 January 2011 and €(2,087) million at 31 December 2011.

The impact at 1 January 2011 mainly concerns the France and United Kingdom segments (€(1,010) million and €(566) million respectively).

### 2.2 Impact on the income statement for 2011

<i>(in millions of Euros)</i>	2011 as published	Impacts of IAS 19 option	2011 restated
Sales	65,307	-	65,307
Fuel and energy purchases	(30,195)	-	(30,195)
Other external expenses	(9,931)	-	(9,931)
Personnel expenses	(10,917)	115	(10,802)
Taxes other than income taxes	(3,101)	-	(3,101)
Other operating income and expenses	3,661	-	3,661
<b>Operating profit before depreciation and amortisation</b>	<b>14,824</b>	<b>115</b>	<b>14,939</b>
Net changes in fair value on Energy and Commodity derivatives, excluding trading activities	(116)	-	(116)
Net depreciation and amortisation	(6,285)	-	(6,285)
Net increases in provisions for renewal of property, plant and equipment operated under concessions	(221)	-	(221)
(Impairment)/reversals	(640)	-	(640)
Other income and expenses	724	51	775
<b>Operating profit</b>	<b>8,286</b>	<b>166</b>	<b>8,452</b>
Cost of gross financial indebtedness	(2,271)	-	(2,271)
Discount effect	(3,064)	-	(3,064)
Other financial income and expenses	1,555	-	1,555
<b>Financial result</b>	<b>(3,780)</b>	<b>-</b>	<b>(3,780)</b>
<b>Income before taxes of consolidated companies</b>	<b>4,506</b>	<b>166</b>	<b>4,672</b>
Income taxes	(1,305)	(31)	(1,336)
Share in income of associates	45	6	51
<b>GROUP NET INCOME</b>	<b>3,246</b>	<b>141</b>	<b>3,387</b>
<b>EDF net income</b>	<b>3,010</b>	<b>138</b>	<b>3,148</b>
<b>Net income attributable to non-controlling interests</b>	<b>236</b>	<b>3</b>	<b>239</b>

## 2.3 Impact on the statement of net income and gains and losses recorded directly in equity for 2011

<i>(in millions of Euros)</i>	2011 as published	Impacts of IAS 19 option	2011 restated
<b>Group net income</b>	<b>3,246</b>	<b>141</b>	<b>3,387</b>
Gross change in the fair value of available-for-sale financial assets	(660)	-	(660)
Related tax effect	176	-	176
<b>Change in fair value of available-for-sale financial assets</b>	<b>(484)</b>	<b>-</b>	<b>(484)</b>
Gross change in fair value of hedging instruments	(1,260)	-	(1,260)
Related tax effect	261	-	261
<b>Change in the fair value of hedging instruments</b>	<b>(999)</b>	<b>-</b>	<b>(999)</b>
Gross change in actuarial gains and losses on post-employment benefits	-	(791)	(791)
Related tax effect	-	270	270
<b>Change in actuarial gains and losses on post-employment benefits <sup>(1)</sup></b>	<b>-</b>	<b>(521)</b>	<b>(521)</b>
<b>Translation adjustments</b>	<b>676</b>	<b>(63)</b>	<b>613</b>
Gains and losses recorded directly in equity	(807)	(584)	(1,391)
<b>NET INCOME AND GAINS AND LOSSES RECORDED DIRECTLY IN EQUITY</b>	<b>2,439</b>	<b>(443)</b>	<b>1,996</b>

(1) EDF's share €(500) million.

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## 2.4 Impact on the balance sheet at 31 December 2011

### ASSETS

<i>(in millions of Euros)</i>	31/12/2011 as published	Impacts of IAS 19 option	31/12/2011 restated
Goodwill	11,648	-	11,648
Other intangible assets	4,702	-	4,702
Property, plant and equipment operated under French public electricity distribution concessions	45,501	-	45,501
Property, plant and equipment operated under concessions for other activities	6,022	-	6,022
Property, plant and equipment used in generation and other tangible assets owned by the Group	60,445	-	60,445
Investments in associates	7,684	(140)	7,544
Non-current financial assets	24,517	(257)	24,260
Deferred tax assets	2,507	652	3,159
<b>Non-current assets</b>	<b>163,026</b>	<b>255</b>	<b>163,281</b>
Inventories	13,581	-	13,581
Trade receivables	20,908	-	20,908
Current financial assets	16,980	-	16,980
Current tax assets	459	-	459
Other receivables	10,309	-	10,309
Cash and cash equivalents	5,743	-	5,743
<b>Current assets</b>	<b>67,980</b>	<b>-</b>	<b>67,980</b>
<b>Assets classified as held for sale</b>	<b>701</b>	<b>-</b>	<b>701</b>
<b>TOTAL ASSETS</b>	<b>231,707</b>	<b>255</b>	<b>231,962</b>

### EQUITY AND LIABILITIES

<i>(in millions of Euros)</i>	31/12/2011 as published	Impacts of IAS 19 option	31/12/2011 restated
Capital	924	-	924
EDF net income and consolidated reserves	29,646	(2,087)	27,559
<b>Equity (EDF share)</b>	<b>30,570</b>	<b>(2,087)</b>	<b>28,483</b>
Equity (non-controlling interests)	4,337	(148)	4,189
<b>Total equity</b>	<b>34,907</b>	<b>(2,235)</b>	<b>32,672</b>
Provisions related to nuclear generation – Back-end nuclear cycle, plant decommissioning and last cores	37,198	-	37,198
Provisions for decommissioning of non-nuclear facilities	809	-	809
Provisions for employee benefits	12,215	2,396	14,611
Other provisions	1,338	-	1,338
<b>Non-current provisions</b>	<b>51,560</b>	<b>2,396</b>	<b>53,956</b>
Special French public electricity distribution concession liabilities	41,769	-	41,769
Non-current financial liabilities	42,688	-	42,688
Other non-current liabilities	4,989	-	4,989
Deferred tax liabilities	4,479	-	4,479
<b>Non-current liabilities</b>	<b>145,485</b>	<b>2,396</b>	<b>147,881</b>
Current provisions	3,968	94	4,062
Trade payables	13,681	-	13,681
Current financial liabilities	12,789	-	12,789
Current tax liabilities	571	-	571
Other current liabilities	19,900	-	19,900
<b>Current liabilities</b>	<b>50,909</b>	<b>94</b>	<b>51,003</b>
<b>Liabilities related to assets classified as held for sale</b>	<b>406</b>	<b>-</b>	<b>406</b>
<b>TOTAL EQUITY AND LIABILITIES</b>	<b>231,707</b>	<b>255</b>	<b>231,962</b>

## 2.5 Impact on the balance sheet at 31 December 2010

### ASSETS

<i>(in millions of Euros)</i>	31/12/2010 as published	Impacts of IAS 19 option	31/12/2010 restated
Goodwill	12,028	-	12,028
Other intangible assets	4,616	-	4,616
Property, plant and equipment operated under French public electricity distribution concessions	43,905	-	43,905
Property, plant and equipment operated under concessions for other activities	6,027	-	6,027
Property, plant and equipment used in generation and other tangible assets owned by the Group	57,268	-	57,268
Investments in associates	7,854	(107)	7,747
Non-current financial assets	24,921	(173)	24,748
Deferred tax assets	2,125	452	2,577
<b>Non-current assets</b>	<b>158,744</b>	<b>172</b>	<b>158,916</b>
Inventories	12,685	-	12,685
Trade receivables	19,524	-	19,524
Current financial assets	16,788	-	16,788
Current tax assets	525	-	525
Other receivables	9,319	-	9,319
Cash and cash equivalents	4,829	-	4,829
<b>Current assets</b>	<b>63,670</b>	<b>-</b>	<b>63,670</b>
<b>Assets classified as held for sale</b>	<b>18,145</b>	<b>20</b>	<b>18,165</b>
<b>TOTAL ASSETS</b>	<b>240,559</b>	<b>192</b>	<b>240,751</b>

### EQUITY AND LIABILITIES

<i>(in millions of Euros)</i>	31/12/2010 as published	Impacts of IAS 19 option	31/12/2010 restated
Capital	924	-	924
EDF net income and consolidated reserves	30,393	(1,671)	28,722
<b>Equity (EDF share)</b>	<b>31,317</b>	<b>(1,671)</b>	<b>29,646</b>
Equity (non-controlling interests)	5,586	(121)	5,465
<b>Total equity</b>	<b>36,903</b>	<b>(1,792)</b>	<b>35,111</b>
Provisions related to nuclear generation – Back-end nuclear cycle, plant decommissioning and last cores	35,630	-	35,630
Provisions for decommissioning of non-nuclear facilities	753	-	753
Provisions for employee benefits	11,745	1,845	13,590
Other provisions	1,337	-	1,337
<b>Non-current provisions</b>	<b>49,465</b>	<b>1,845</b>	<b>51,310</b>
Special French public electricity distribution concession liabilities	41,161	-	41,161
Non-current financial liabilities	40,646	-	40,646
Other non-current liabilities	4,965	-	4,965
Deferred tax liabilities	4,894	-	4,894
<b>Non-current liabilities</b>	<b>141,131</b>	<b>1,845</b>	<b>142,976</b>
Current provisions	5,010	68	5,078
Trade payables	12,805	-	12,805
Current financial liabilities	12,766	-	12,766
Current tax liabilities	396	-	396
Other current liabilities	18,674	-	18,674
<b>Current liabilities</b>	<b>49,651</b>	<b>68</b>	<b>49,719</b>
<b>Liabilities related to assets classified as held for sale</b>	<b>12,874</b>	<b>71</b>	<b>12,945</b>
<b>TOTAL EQUITY AND LIABILITIES</b>	<b>240,559</b>	<b>192</b>	<b>240,751</b>

## 2.6 Impact on the statement of cash flows for 2011

<i>(in millions of Euros)</i>	2011 as published	Impacts of IAS 19 option	2011 restated
<b>Operating activities:</b>			
Income before taxes of consolidated companies	4,506	166	4,672
Impairment (reversals)	640	-	640
Accumulated depreciation and amortisation, provisions and change in fair value	7,325	(115)	7,210
Financial income and expenses	1,117	-	1,117
Dividends received from associates	334	-	334
Capital gains/losses	(686)	(51)	(737)
Change in working capital	(1,785)	-	(1,785)
<b>Net cash flow from operations</b>	<b>11,451</b>	<b>-</b>	<b>11,451</b>
Net financial expenses disbursed	(1,623)	-	(1,623)
Income taxes paid	(1,331)	-	(1,331)
<b>Net cash flow from operating activities</b>	<b>8,497</b>	<b>-</b>	<b>8,497</b>
<b>Investing activities:</b>			
Investments, net of cash acquired/transferred	3,624	-	3,624
Investments in intangible assets and property, plant and equipment	(11,134)	-	(11,134)
Net proceeds from sale of intangible assets and property, plant and equipment	497	-	497
Changes in financial assets	222	-	222
<b>Net cash flow used in investing activities</b>	<b>(6,791)</b>	<b>-</b>	<b>(6,791)</b>
<b>Financing activities:</b>			
Transactions with non-controlling interests	(1,324)	-	(1,324)
Dividends paid by parent company	(2,122)	-	(2,122)
Dividends paid to non-controlling interests	(261)	-	(261)
Purchases/sales of treasury shares	(14)	-	(14)
<b>Cash flows with shareholders</b>	<b>(3,721)</b>	<b>-</b>	<b>(3,721)</b>
Issuance of borrowings	5,846	-	5,846
Repayment of borrowings	(4,071)	-	(4,071)
Funding contributions received for assets operated under concessions	194	-	194
Investment subsidies received	161	-	161
<b>Other cash flows from financing activities</b>	<b>2,130</b>	<b>-</b>	<b>2,130</b>
<b>Net cash flow used in financing activities</b>	<b>(1,591)</b>	<b>-</b>	<b>(1,591)</b>
<b>Net increase (decrease) in cash and cash equivalents</b>	<b>115</b>	<b>-</b>	<b>115</b>
<b>CASH AND CASH EQUIVALENTS - OPENING BALANCE</b>	<b>5,567</b>	<b>-</b>	<b>5,567</b>
Net increase/(decrease) in cash and cash equivalents	115	-	115
Effect of currency fluctuations	54	-	54
Financial income on cash and cash equivalents	44	-	44
Effect of reclassifications	(37)	-	(37)
<b>CASH AND CASH EQUIVALENTS - CLOSING BALANCE</b>	<b>5,743</b>	<b>-</b>	<b>5,743</b>



## ➤ Note 3. Significant events and transactions

### 3.1 Edison – takeover by the EDF group

#### 3.1.1 Description of operations

Once the conditions were fulfilled, on 24 May 2012 the EDF group and its Italian partners finalised the takeover of the energy group Edison. The principles of the final agreement were consistent with the preliminary agreement signed by the parties on 26 December 2011.

The Group thus took control of Edison on 24 May 2012 by purchasing Delmi's entire investment (50%) in Transalpina di Energia (TdE) for a total of €784 million, corresponding to the negotiated price of €0.89 per Edison share.

Following this acquisition the Group held 78.96% of the capital and 80.64% of the voting rights in Edison.

At the same time as the EDF group took control of Edison, Delmi took control of Edipower by purchasing the investments in Edipower held by Edison (50%) and Alpiq (20%) for the total consideration of €884 million. Edison and Edipower also signed a long-term (6-year) gas supply contract to cover 50% of Edipower's gas requirements.

In compliance with Italian stock market regulations, on 2 July 2012 the EDF Group launched a mandatory tender offer for the remaining Edison shares, at the price of €0.89 per ordinary share. No offer was made for non-voting shares.

976,306,145 ordinary shares, corresponding to a total of €869 million, were tendered to the offer by minority shareholders by the closing date of 6 September 2012. The additional cost of raising this offer price from the €0.84 envisaged in the preliminary agreement of 26 December 2011 – a total increase of €48 million – was borne in equal shares by the EDF group and Delmi.

Between 2 and 30 November 2012, an offer was also made to Edison minority shareholders to convert their "saving shares", which carry no voting rights, into ordinary shares. As a result of this offer, 437,573 non-voting shares were converted into ordinary shares.

After the mandatory tender offer and the conversion offer for non-voting shares, the EDF group holds 97.40% of the capital and 99.48% of the voting rights of Edison at 31 December 2012.

Italian stock market regulations do not require the EDF group to buy the remaining Edison shares still held by minority shareholders after the mandatory tender offer.

In application of Italian law, ordinary shares in Edison have been delisted since 11 September 2012.

#### 3.1.2 Accounting treatment of the operation

For accounting purposes this operation has been treated as two separate transactions:

- takeover of Edison and TdE by purchasing Delmi's investment in TdE;
- acquisition of minority interests in Edison through the mandatory public offer.

#### 3.1.2.1 Accounting treatment of the takeover of Edison and TdE

The purchase of 50% of TdE from Delmi gave the EDF group control over the Edison group and TdE as of 24 May 2012. Although the mandatory tender offer for Edison shares launched on 2 July 2012 was an inevitable consequence of acquisition of TdE under Italian stock market regulations, for accounting purposes it is considered as a separate operation from the takeover of Edison, since:

- minority shareholders were free to accept or refuse the offer;
- control was acquired on 24 May 2012, independently of the number of shares tendered to the offer by minority shareholders, and cannot be called into question.

Consequently, as required by IFRS 3 (revised) (IFRS 3), the identifiable assets and liabilities acquired from Edison and TdE were recorded at fair value at the date control was acquired. The Group opted to state non-controlling interests at fair value in application of the "full goodwill" method.

In accordance with IFRS 3, the values determined are provisional and the Group has 12 months to finalise allocation of the acquisition price.

Delmi's share of the cost of the mandatory tender offer for Edison shares was considered as a purchase price adjustment clause for the investment in TdE/Edison.

Application of IFRS 3 to the takeover of Edison and TdE is therefore reflected in the following items in the Group's consolidated financial statements:

- a loss on sale of €(1,090) million resulting from remeasurement of the previous holding in Edison to "market participant<sup>1</sup>" fair value at the date control was acquired;
- negative goodwill of €1,023 million.

Since the price for the sale of Edison's investment in Edipower to Delmi was higher than defined in the preliminary agreement of 26 December 2011, a reversal of impairment of €39 million (EDF's share) has been booked in the 2012 income statement.

Finally, acquisition expenses amounting to €(30) million before taxes were recognised in 2012.

Overall, the takeover of Edison and TdE thus generated a €(58) million expense, recognised in the 2012 consolidated income statement under "Other income and expenses".

#### 3.1.2.2 Accounting treatment of the acquisition of minority interests in Edison

In accounting terms, the acquisition of minority interests in the Edison group through the mandatory public offer is a separate transaction from the takeover of Edison (see 3.1.2.1). In accordance with IAS 27 (amended), it was therefore treated as a transaction between shareholders, and the difference between the price paid (including expenses related to the operation) and the share of net assets acquired was recorded in equity in the amount of €(24) million.

#### 3.1.3 Determination of the loss on sale of the previously-held investment

In application of IFRS 3, a loss on sale has been recognised, equal to the difference between the net consolidated value and the "market participant" fair value of the Group's investment in the Edison and TdE subgroups at the date of the takeover.

The "market participant" fair value corresponds to the market price for Edison shares, i.e. the price applied for the transactions with Delmi and minority shareholders through the mandatory tender offer launched on 2 July 2012 (€0.89 per share).

1. The "market participant" fair value is the amount for which an asset could be exchanged between knowledgeable, willing parties in an arm's length transaction.

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The loss on the sale has been recorded under "Other income and expenses" in the 2012 consolidated financial statements. It was determined as follows.

(in millions of Euros)

(A) "Market participant" fair value <sup>(1)</sup>	1,709
(B) Net book value of previously-held investment	2,804
(C) Effect of transfer to income of gains and losses recorded directly in equity	5
<b>(A-B+C) LOSS ON SALE</b>	<b>(1,090)</b>

(1) The "market participant" fair value is the amount for which an asset could be exchanged between knowledgeable, willing parties in an arm's length transaction.

## 3.1.4 Edison initial balance sheet items in the EDF group consolidation and determination of goodwill

### 3.1.4.1 Provisional initial balance sheet

The fair value of Edison's identifiable assets and liabilities is the Group's current best estimate, based on Edison's most recent available business plan (the 2012-2019 plan) and using standard valuation methods.

After determination of the fair values of the assets acquired and liabilities assumed, Edison's provisional initial balance sheet at 24 May 2012 (basis: 100%) is as follows.

## ASSETS

(in millions of Euros)	Historical values	Fair value adjustments	Provisional initial values
Goodwill	2,859	(2,859)	- <sup>(1)</sup>
Other intangible assets	1,436	1,721	3,157 <sup>(2)</sup>
Property, plant and equipment	5,222	1,306	6,528 <sup>(3)</sup>
Investments in associates	49	-	49
Financial assets	815	-	815
Deferred tax assets	111	-	111
Inventories	324	-	324
Trade receivables	3,157	-	3,157
Current tax assets	24	-	24
Other receivables	575	-	575
Cash and cash equivalents	335	-	335
Assets classified as held for sale	1	-	1
<b>TOTAL ASSETS</b>	<b>14,908</b>	<b>168</b>	<b>15,076</b>

## EQUITY AND LIABILITIES

(in millions of Euros)	Historical values	Fair value adjustments	Provisional initial values
Capital	5,292	-	5,292
EDF net income and consolidated reserves	1,660	(1,280)	380
<b>Equity (EDF share)</b>	<b>6,952</b>	<b>(1,280)</b>	<b>5,672</b>
Equity (non-controlling interests)	150	204	354 <sup>(2)</sup>
<b>Total equity</b>	<b>7,102</b>	<b>(1,076)</b>	<b>6,026</b>
Provisions	922	126	1,048 <sup>(5)</sup>
Financial liabilities	3,982	(39)	3,943 <sup>(5)</sup>
Deferred tax liabilities	371	1,157	1,528 <sup>(4)</sup>
Trade payables	1,928	-	1,928
Current tax liabilities	39	-	39
Other liabilities	564	-	564
<b>TOTAL EQUITY AND LIABILITIES</b>	<b>14,908</b>	<b>168</b>	<b>15,076</b>

The main restatements resulting from fair value adjustments of the assets acquired and liabilities assumed are:

- (1) Cancellation of historical goodwill (€(2,859) million).
- (2) Adjustment of the fair value of intangible assets (€1,721 million), comprising:
  - Creation of intangible assets representing the Edison brand (€945 million) and customer relations (€190 million)

The brand has been valued by using the relief from royalty method and "scoring" based on a market study designed to position Edison in relation to its main competitors on the Italian market.

As the Edison brand is a very well-known brand in Italy and the Group intends to continue using it in the long term, its useful life has been considered indefinite.

The fair value assigned to the Edison brand is sensitive to changes in the following main assumptions:

- royalty rates;
- discount rates applied to future cash flows.
- Revaluation of hydropower concession assets (intangibles) (€1,165 million)

The fair value of hydropower concessions was determined by the discounted future cash flows method, based on the most recent available Edison business plan (the 2012-2019 plan) and assuming systematic renewal of current concessions for a 20-year duration from the renegotiation date, although on revised financial terms.

A conservative approach was taken, applying a risk premium to the rate used to discount cash flows, and limiting the assumed renewal of concessions to a 20-year duration. Italian regulations on such matters are currently in preparation, and 20 years is expected to be the minimum duration for future concessions.

This fair value is sensitive to changes in the following main assumptions:

- occurrence, duration and terms of concession renewals;
- electricity market prices in Italy;
- cash flow discount rates.

Hydropower concession assets are depreciated over the assumed duration of the concession (26 years on average).

€204 million (net of taxes) of this revaluation of hydropower concession assets is attributable to minority interests.

- Revaluation of long-term gas supply contracts (€230 million)

Long-term gas supply contracts have been revalued using the discounted future cash flows method, based on the most recent available Edison business plan (the 2012-2019 plan).

This fair value is sensitive to changes in the following main assumptions:

- gas and electricity market prices in Italy;
- Edison's margin levels on contract renegotiations, both ongoing and future;
- cash flow discount rates.

Intangible assets related to long-term supply contracts are amortised on the basis of volumes and contract durations (from 8 to 23 years).

- Reclassification of Exploration-Production assets as tangible assets (€(975) million)

In determining Edison's initial balance sheet, Exploration-Production assets, which were included in intangible assets in Edison's historical balance sheet in the amount of €975 million – mainly concerning Abu Qir in Egypt – were reclassified as tangible assets. A fair value for hydrocarbon reserves is thus visible in the balance sheet.

- (3) Fair value adjustments of tangible assets, amounting to €1,306 million, mainly result from reclassification of Exploration-Production assets (see before) and revaluation of certain electricity generation assets (fossil-fired and wind power assets) and Exploration-Production assets.

- (4) Deferred taxes (€(1,157) million)  
Restatements of deferred taxes correspond solely to tax effects associated with fair value adjustments carried out for determination of the initial balance sheet.

- (5) Other fair value adjustments  
Other adjustments mainly concern contingent liabilities and financial liabilities.

Fair value adjustments of TdE assets and liabilities (excluding Edison shares) mainly result from remeasurement of financial liabilities to fair value (€5 million net of taxes).

No significant change has been made to the initial balance presented in the condensed half-year consolidated financial statements at 30 June 2012.

### 3.1.4.2 Determination of provisional goodwill

The provisional goodwill recognised on the operation is as follows:

(in millions of Euros)

Fair value of previously-held investment	1,709
Acquisition price of the investment	784
Fair value of non-controlling interests <sup>(1)</sup>	991
Price adjustment clause/costs borne by Delmi	(24)
<b>Purchase consideration transferred at 24 May 2012</b>	<b>3,460</b>
Fair value of Edison net assets acquired	5,672
Fair value of TdE net assets acquired (excluding Edison shares) <sup>(2)</sup>	(1,189)
<b>Fair value of assets acquired and liabilities assumed</b>	<b>4,483</b>
<b>PROVISIONAL NEGATIVE GOODWILL</b>	<b>(1,023)</b>

(1) After application of the "full goodwill" method, based on the price of the mandatory tender offer to minority shareholders, i.e. €0.89 per Edison share.

(2) Excluding Edison shares, TdE's balance sheet mainly comprises financial liabilities.

In compliance with IFRS 3, the process for identifying items included in calculating the negative goodwill has been verified and validated to confirm the existence of this income, and the negative goodwill has been included as income in net income (EDF's share) for 2012.

### 3.1.5 Sensitivity analyses

The main assumptions to which assets and liabilities in the initial balance sheet are sensitive are:

- gas and electricity market prices in Italy;
- gas and electricity sales volumes included in the Edison business plan (the 2012-2019 plan);
- royalty rates used to value the Edison brand;
- financial terms of long-term gas supply contracts;
- assumptions concerning renewal of hydropower concessions (duration, financial terms, etc);
- discount rates by country.

In compliance with IFRS 3, the values of the assets acquired and the liabilities assumed are provisional, and the Group has 12 months to finalise allocation of the purchase price.

If the initial balance sheet is adjusted within the allocation deadline but after 31 December 2012, the fact that the goodwill is negative would lead to recognition of any impacts of the Edison takeover in the Group's income statement. A change in the fair values used would thus have an equivalent impact on the EDF Group's net income (a decline or increase in the value of the assets would lead respectively to a loss or gain).

### 3.1.6 Impact of the operation on the Group's net indebtedness at 31 December 2012

The takeover of Edison and TdE has the following impacts on consolidated net indebtedness at 31 December 2012.

(in millions of Euros)

Acquisition price for the shares of TdE	784
Sale price for Edison's disposal of Edipower	(684)
Purchase price for Edison shares (mandatory public offer)	869
<b>Net payments</b>	<b>969</b>
Effects of changes in scope/Edison	2,217
Effects of changes in scope/TdE	634
Effects of changes in scope/sale of Edipower	(515)
Effects of fair value measurement of financial liabilities of TdE/Edison	(46)
<b>Effects of fair value measurement of financial liabilities of TdE/Edison</b>	<b>2,290</b>
<b>INCREASE/(DECREASE) IN NET INDEBTEDNESS</b>	<b>3,259</b>

### 3.1.7 Effects of the takeover of Edison on the Group's main income statement indicators in 2012

If the takeover of Edison had taken place at 1 January 2012, the impacts on the Group's main income statement indicators would have been as follows:

(in millions of Euros)	2012 as published	2012 as proforma <sup>(1)</sup>	Change
Sales	72,729	75,223	+2,494
EBITDA	16,084	16,201	+117
Net income (EDF share)	3,316	3,288	(28)

(1) Data for 2012 with full consolidation of Edison from 1 January 2012 (from 24 May 2012 in the published figures).

## 3.2 Edison – renegotiation of long-term gas supply contracts

During the second half of 2012, the Court of Arbitration of the ICC (International Chamber of Commerce) ruled in favour of Edison in the litigations over price revisions for the long-term gas supply contracts with Rasgas (Qatar) and ENI (Libya).

This generated a positive impact of €680 million (including €347 million for years prior to 2012), which is included in the EDF group's EBITDA for 2012.

An arbitration procedure is still in progress concerning the gas supply contract with Sonatrach (Algeria). The statements of position are expected to be submitted in 2013.

## 3.3 Developments relating to the Flamanville 3 EPR project

### 3.3.1 Flamanville 3

In December 2012 EDF announced that the cost of constructing the Flamanville 3 project was to be revised upwards by €2 billion from the cost (of around €6 billion at constant 2008 values) announced in July 2011. The first marketable electricity output is scheduled for 2016.

In addition to the "lead unit" effect, certain other factors have affected the full cost of construction: changes in the boiler design, additional engineering studies, incorporation of new regulatory requirements and the lessons learned from Fukushima. The revised cost also reflects the additional expenditure associated with industrial contingencies, such as replacement of the supports for the reactor building polar crane and its effect on the work schedule, as well as the financial impact of extending construction deadlines.

### 3.3.2 Termination of the overall nuclear partnership between EDF and ENEL

In November 2007, EDF and ENEL signed a series of agreements governing cooperation for nuclear operations, under the terms of which ENEL took a 12.5% stake in the Flamanville EPR project.

Given the changes in the economic environment and the project itself, as well as the discontinuation of the Italian nuclear revival programme following the June 2011 referendum, ENEL and EDF announced on 4 December 2012 that they were ending their cooperation. They consequently waived their respective options in each other's programmes, and ENEL withdrew from the Flamanville EPR project with effect from 19 December 2012. EDF therefore reimbursed ENEL's investment in the project, totalling €658 million including penalties. In return, EDF will have full rights to the electricity generated by Flamanville 3.

## 3.4 Significant events and transactions of 2011

### 3.4.1 Simplified alternative public cash or exchange offer for EDF Énergies Nouvelles

On 8 April 2011 the EDF group, which already owned 50% of EDF Énergies Nouvelles, launched a simplified alternative public offer to acquire all the shares in EDF Énergies Nouvelles, for a cash consideration or in exchange for shares.

The offer closed on 16 June 2011, and the Group acquired the shares tendered for the sum of €1,351 million, raising its ownership of EDF Énergies Nouvelles to 96.71%.

EDF then proceeded with a compulsory squeeze-out of shares not tendered to the offer, at the price of €40 per share.

After this operation, EDF Énergies Nouvelles remained fully consolidated, with the Group's percentage interest at 100% from 29 June 2011.

### 3.4.2 Sale of the investment in EnBW

The disposal of the Group's holding in EnBW was completed on 17 February 2011. On that date, in application of the agreements signed by the two parties on 6 December 2010, the sum of €4.5 billion was paid to the EDF group in addition to the €169 million downpayment received on 16 December 2010. The net gain on the sale is €304 million (€327 million before taxes, included in "Other income and expenses").

## ➤ Note 4. Regulatory events in France

### 4.1 Agreement on recovery of deficits related to the CSPE

The Contribution to the Public Electricity Service (*Contribution au Service Public de l'Électricité* or CSPE) is a contribution set by the State and collected directly from the end-user of electricity to compensate for certain public service charges borne by EDF. It is intended to finance the rise in renewable energies, social tariffs and tariff equalisation.

Since 2007, the amount of CSPE collected has been unable to cover these charges, despite a system of regular rises in the CSPE introduced by the French finance law of 2011, and the resulting shortfall was affecting Group indebtedness.

Under the agreement reached with the French authorities and announced on 14 January 2013, EDF is to receive reimbursement of the receivable consisting of the CSPE shortfall at 31 December 2012 (€4.3 billion) and the costs of bearing this shortfall for the Group (€0.6 billion). The final amount of the receivable will only be set in 2013 after the deliberations of the French Market Regulator CRE (*Commission de Régulation de l'Énergie*) for recognition of the 2012 public service expenses.

A progressive reimbursement schedule for this €4.9 billion receivable was validated in the agreement. It runs until 2018, and bears interest at market rates (1.72%) which will be included in financial income in the Group's consolidated financial statements.

Following conclusion of this agreement, the Group recorded financial income of €0.6 billion at 31 December 2012, and transferred the CSPE receivable from "Other receivables" to "Financial loans and receivables" at an amount of €4.3 billion.

### 4.2 "NOME" Law – European Commission decision

On 12 June 2012 the European Commission announced that subject to conditions, it approved the State aid contained in the regulated electricity tariffs in France. In 2007 the Commission had opened an investigation into the regulated tariffs for sales to business customers (the "yellow" and "green" tariffs and the TaRTAM transition tariff). Since then, France's NOME law on the new electricity market organisation has modified the French legislative and regulatory context by discontinuing the TaRTAM transition tariff, programming the end of the "yellow" and "green" tariffs for the end of 2015 and setting up a scheme for regulated access to nuclear power (named ARENH, for *Accès Régulé à l'Électricité Nucléaire Historique*) for all suppliers of customers located in France.

Following an inquiry, the European Commission concluded that the business tariffs constitute State aid, but are nevertheless compatible with European law provided:

- the ARENH price remains at €42/MWh until the Commission gives approval of the methodology used to set the ARENH price;
- there is a gradual move towards cost-based pricing every year from the summer of 2012, until the "yellow" and "green" tariffs cease to exist at the end of 2015.

This decision marks the end of the European Commission's investigation concerning State aid.

## ➤ Note 5. Changes in the scope of consolidation

In addition to the EDF group's takeover of Edison as described in note 3.1, the main changes in the scope of consolidation during 2012 concern the following entities.

### 5.1 Poland

The purchase of EnBW's investments in subsidiaries ERSA, Kogeneracja and EDF Polska was completed on 16 February 2012 for the sum of €301 million. Following this transaction EDF now owns 97.4% of ERSA and 50% plus one share in Kogeneracja. Kogeneracja and Zielona Gora are again fully consolidated as of 16 February 2012, having been proportionally

consolidated since 17 February 2011 after the sale of EnBW (EDF's holdings were respectively 33.4% and 32.9% at 31 December 2011).

The acquisition of minority interests in ERSA is treated as a transaction between shareholders in accordance with IAS 27 (amended), and as a result has an impact of €(124) million on equity in the Group's consolidated financial statements.

In application of IFRS 3 (revised), a €(10) million loss on sale was also recorded in 2012 corresponding to the previous ownership share in Zielona Gora and Kogeneracja. The additional goodwill associated with this operation is below €1 million.



### 5.2 Photowatt/PV Alliance

EDF's offer for the activities of Photowatt was accepted on 27 February 2012. Via its subsidiary EDF Énergies Nouvelles Réparties (EDF ENR), the Group took possession of the assets of Photowatt and took control of PV Alliance on 1 March 2012. This takeover of business has no significant impact on the Group's consolidated financial statements at 31 December 2012.

### 5.3 Enerest

On 1 April 2012 Électricité de Strasbourg acquired 100% of Enerest, the longstanding gas supplier to the economic region of Strasbourg. The acquisition price was €139 million. Following establishment of a provisional initial balance sheet, intangible assets (principally concerning customer relations and the "Gaz de Strasbourg" brand) were valued at €38 million before tax effects.

The provisional goodwill on this operation recorded in the consolidated financial statements at 31 December 2012 amounts to €89 million.

## ➤ Note 6 Segment reporting

### 6.1 Reporting by operating segment

Segment reporting presentation complies with IFRS 8, "Operating segments".

Segment reporting is determined before inter-segment eliminations. Inter-segment transactions take place at market prices.

In accordance with IFRS 8, the breakdown used by the EDF group corresponds to the operating segments as regularly reviewed by the Management Committee. The Group uses the following segments:

- **"France"**: EDF, RTE Réseau de Transport d'Électricité and ERDF, comprising the deregulated activities (mainly Generation and Supply), network activities (Distribution and Transmission) and island activities;

- **"United Kingdom"**: the entities of the EDF Energy subgroup including EDF Energy Nuclear Generation Ltd and EDF Development Company Ltd;
- **"Italy"**: all the entities located in Italy, principally the Edison subgroup, TdE and Fenice;
- **"Other international"**: EDF International and the other gas and electricity entities located in continental Europe, the US, Latin America and Asia;
- **"Other activities"**: all the group's other investments, including EDF Trading, EDF Énergies Nouvelles, Dalkia, Tiru, Électricité de Strasbourg and EDF Investissements Groupe.

No segments have been merged.

#### 6.1.1 At 31 December 2012

	France	United Kingdom	Italy	Other international	Other activities	Inter-segment eliminations	Total
<i>(in millions of Euros)</i>							
External sales	39,120	9,739	10,098	7,976	5,796	-	72,729
Inter-segment sales	585	-	-	212	632	(1,429)	-
<b>TOTAL SALES</b>	<b>39,705</b>	<b>9,739</b>	<b>10,098</b>	<b>8,188</b>	<b>6,428</b>	<b>(1,429)</b>	<b>72,729</b>
<b>OPERATING PROFIT BEFORE DEPRECIATION AND AMORTISATION</b>	<b>9,930</b>	<b>2,054</b>	<b>1,019</b>	<b>1,067</b>	<b>2,014</b>	<b>-</b>	<b>16,084</b>
<b>OPERATING PROFIT</b>	<b>5,566</b>	<b>972</b>	<b>265</b>	<b>86</b>	<b>1,356</b>	<b>-</b>	<b>8,245</b>
<b>Balance sheet:</b>							
Intangible assets and property, plant and equipment	86,077	13,206	10,017	8,784	11,783	-	129,867
Investments in associates	4,786	25	51	2,111	582	-	7,555
Goodwill	-	8,339	-	605	1,468	-	10,412
Other segment assets <sup>(1)</sup>	27,627	4,332	4,102	1,825	7,310	-	45,196
Assets classified as held for sale	-	240	1	-	-	-	241
Other non-allocated assets							56,847
<b>TOTAL ASSETS</b>	<b>118,490</b>	<b>26,142</b>	<b>14,171</b>	<b>13,325</b>	<b>21,143</b>	<b>-</b>	<b>250,118</b>
<b>Other information:</b>							
Investments in intangible assets and property, plant and equipment	8,235	1,643	438	490	2,580	-	13,386
Net depreciation and amortisation	(4,186)	(888)	(644)	(590)	(541)	-	(6,849)
Impairment	-	(234)	(44)	(389)	(85)	-	(752)

(1) Other segment assets include inventories, trade receivables and other receivables.

## 6.1.2 At 31 December 2011

	France	United Kingdom	Italy	Other international	Other activities	Inter-segment eliminations	Total
<i>(in millions of Euros)</i>							
External sales	37,171	8,568	6,552	7,501	5,515	-	65,307
Inter-segment sales	578	8	-	185	620	(1,391)	-
<b>TOTAL SALES</b>	<b>37,749</b>	<b>8,576</b>	<b>6,552</b>	<b>7,686</b>	<b>6,135</b>	<b>(1,391)</b>	<b>65,307</b>
<b>OPERATING PROFIT BEFORE DEPRECIATION AND AMORTISATION</b>	<b>9,196</b>	<b>1,942</b>	<b>592</b>	<b>1,280</b>	<b>1,929</b>	<b>-</b>	<b>14,939</b>
<b>OPERATING PROFIT</b>	<b>5,461</b>	<b>1,026</b>	<b>(155)</b>	<b>997</b>	<b>1,123</b>	<b>-</b>	<b>8,452</b>
<b>Balance sheet:</b>							
Intangible assets and property, plant and equipment	80,537	12,682	3,965	8,966	10,520	-	116,670
Investments in associates	4,620	25	24	2,302	573	-	7,544
Goodwill	-	8,260	1,400	599	1,389	-	11,648
Other segment assets <sup>(1)</sup>	27,604	4,647	1,837	1,792	8,918	-	44,798
Assets classified as held for sale	-	-	700	1	-	-	701
Other non-allocated assets							50,601
<b>TOTAL ASSETS</b>	<b>112,761</b>	<b>25,614</b>	<b>7,926</b>	<b>13,660</b>	<b>21,400</b>	<b>-</b>	<b>231,962</b>
<b>Other information:</b>							
Investments in intangible assets and property, plant and equipment	7,378	1,179	318	437	1 822	-	11,134
Net depreciation and amortisation	(3,899)	(966)	(427)	(528)	(465)	-	(6,285)
Impairment	-	-	(320)	(53)	(267)	-	(640)

(1) Other segment assets include inventories, trade receivables and other receivables.

## 6.2 Sales to external customers, by product and service group

The Group's sales are broken down by product and service group as follows:

- **"Generation/Supply"**: energy generation and energy sales to industry, local authorities, small businesses and residential consumers. This segment also includes commodity trading activities;
- **"Distribution"**: management of the low and medium-voltage public distribution network;
- **"Other"**: energy services (district heating, thermal energy services, etc) for industry and local authorities, and new businesses mainly aimed at boosting electricity generation through cogeneration and renewable energy sources (e.g. wind turbines, solar panels, etc).

	Generation/ Supply	Distribution	Other	Eliminations <sup>(1)</sup>	Total
<i>(in millions of Euros)</i>					
<b>At 31 December 2012:</b>					
External sales:					
– France	25,330	14,194	159	(563)	39,120
– Rest of the world	29,264	431	3,914	-	33,609
<b>TOTAL SALES</b>	<b>54,594</b>	<b>14,625</b>	<b>4,073</b>	<b>(563)</b>	<b>72,729</b>
<b>At 31 December 2011:</b>					
External sales:					
– France	24,535	13,099	123	(586)	37,171
– Rest of the world	24,092	432	3,612	-	28,136
<b>TOTAL SALES</b>	<b>48,627</b>	<b>13,531</b>	<b>3,735</b>	<b>(586)</b>	<b>65,307</b>

(1) Eliminations between deregulated activities: €(31) million for 2012, €(30) million for 2011.

## Income statements

### ➤ Note 7 Sales

Sales are comprised of:

<i>(in millions of Euros)</i>	2012	2011
Sales of energy and energy-related services	67,538	60,143
Other sales of goods and services	4,388	4,247
Trading	803	917
<b>SALES</b>	<b>72,729</b>	<b>65,307</b>

As well as the organic growth resulting from price and volume effects, the sales growth of 2012 was the effect of changes in the scope of consolidation (chiefly Edison) and favourable foreign exchange effects, largely due to the rise of the pound sterling against the Euro.

### ➤ Note 8 Fuel and energy purchases

Fuel and energy purchases comprise:

<i>(in millions of Euros)</i>	2012	2011
Fuel purchases used - power generation	(13,815)	(9,922)
Energy purchases	(15,279)	(13,957)
Transmission and delivery expenses	(8,191)	(6,841)
Gain/loss on hedge accounting	73	274
(Increase)/decrease in provisions related to nuclear fuels and energy purchases	114	251
<b>FUEL AND ENERGY PURCHASES</b>	<b>(37,098)</b>	<b>(30,195)</b>

Fuel purchases used include costs relating to raw materials for energy generation (coal, biomass, oil, propane, fissile materials, nuclear fuels and gas), purchases of services related to the nuclear fuel cycle, and costs associated with environmental schemes (mainly CO<sub>2</sub> emission rights and renewable energy certificates).

Energy purchases include energy generated by third parties, including energy derived from cogeneration intended for resale.

The rise in fuel and energy purchases in 2012 is explained by the same factors as the rise in sales.

### ➤ Note 9 Other external expenses

Other external expenses comprise:

<i>(in millions of Euros)</i>	2012	2011
External services	(11,948)	(10,710)
Other purchases (excluding external services, fuel and energy)	(3,223)	(3,638)
Change in inventories and capitalised production	4 864	4,147
(Increase)/decrease in provisions on other external expenses	220	270
<b>OTHER EXTERNAL EXPENSES</b>	<b>(10,087)</b>	<b>(9,931)</b>

## ➤ Note 10 Personnel expenses

### 10.1 Personnel expenses

Personnel expenses comprise:

<i>(in millions of Euros)</i>	<b>2012</b>	2011
Wages and salaries	(7,400)	(7,119)
Social contributions	(1,641)	(1,346)
Employee profit sharing	(211)	(211)
Other contributions related to personnel	(372)	(375)
Other expenses linked to short-term benefits	(229)	(206)
<b>Short-term benefits</b>	<b>(9,853)</b>	<b>(9,257)</b>
Expenses under defined-contribution plans	(795)	(730)
Expenses under defined-benefit plans	(692)	(697)
<b>Post-employment benefits</b>	<b>(1,487)</b>	<b>(1,427)</b>
Other long-term expenses	(282)	(116)
Termination payments	(2)	(2)
<b>Other personnel expenses</b>	<b>(284)</b>	<b>(118)</b>
<b>PERSONNEL EXPENSES</b>	<b>(11,624)</b>	<b>(10,802)</b>

### 10.2 Average workforce

	<b>2012</b>	2011
IEG status	98,783	96,385
Other	55,947	55,419
<b>AVERAGE WORKFORCE</b>	<b>154,730</b>	<b>151,804</b>

Average workforce numbers are reported on a full-time equivalent basis.

Personnel corresponding to proportionally consolidated companies included pro rata with the Group's percentage interest represent the equivalent of 18,967 full-time employees at 31 December 2012 (22,504 full-time equivalent employees at 31 December 2011).

## ➤ Note 11 Taxes other than income taxes

Taxes other than income taxes break down as follows:

<i>(in millions of Euros)</i>	<b>2012</b>	2011
Payroll taxes	(221)	(209)
Energy taxes	(1,435)	(1,396)
Other non-income taxes	(1,631)	(1,496)
<b>TAXES OTHER THAN INCOME TAXES</b>	<b>(3,287)</b>	<b>(3,101)</b>

## ➤ Note 12 Other operating income and expenses

Other operating income and expenses comprise:

<i>(in millions of Euros)</i>	Notes	2012	2011
Operating subsidies	12.1	4,824	3,679
Net income/(expense) associated with the TaRTAM transition tariff system	12.2	93	(132)
Net income on deconsolidation		75	140
Gains on disposal of property, plant and equipment	12.3	116	79
Net increase in provisions on current assets		(235)	(54)
Net increase in provisions for operating contingencies and losses	12.4	119	217
Other items	12.5	459	(268)
<b>OTHER OPERATING INCOME AND EXPENSES</b>		<b>5,451</b>	<b>3,661</b>

### 12.1 Operating subsidies

This item mainly comprises the subsidy received or receivable by EDF in respect of the Contribution to the Public Electricity Service (CSPE), reflected in the financial statements through recognition of income of €4,687 million for 2012 (€3,556 million for 2011). The difference is largely attributable to the higher volumes of purchase obligations, essentially for photovoltaic and wind power, and fuel purchases in non-interconnected zones.

### 12.2 Net income/(expense) associated with the TaRTAM transition tariff system

Other operating income and expenses in 2012 include €93 million of income resulting from the CRE's decision of 9 October 2012 setting the final charge for the TaRTAM transition tariff system.

In 2011, other operating income and expenses included a net expense of €(132) million for the TaRTAM system. This net amount includes €(170) million resulting from the decision of 4 July 2011 issued after the CRE's re-estimation of the cost based on information provided by the suppliers concerned.

### 12.3 Gains on disposal of property, plant and equipment

In 2012 this item chiefly results from gains on sales of real estate assets in France, amounting to €270 million.  
In 2011 it mainly reflected gains on sales of real estate assets in France and the United Kingdom.

### 12.4 Net increase in provisions for operating contingencies and losses

In 2012, the net increase in provisions for operating contingencies and losses includes €139 million corresponding to reversals of fair value on British Energy commodity sales contracts recognised at the acquisition date of 5 January 2009, following their settlement (€318 million in 2011).

### 12.5 Other items

In 2012, Other items include €347 million corresponding to the effects of the rulings in Edison's favour in the litigations over price revisions for the long-term gas supply contracts with Rasgas (Qatar) and ENI (Libya).



## ➤ Note 13 Impairment/reversals

### 13.1 Impairment by category of asset

Details of impairment recognised and reversed are as follows:

<i>(in millions of Euros)</i>	Notes	2012	2011
Impairment of goodwill	18	(52)	(655)
Impairment of other intangible assets	19	(27)	(88)
Impairment of tangible assets and discontinued operations <sup>(1)</sup>	21-22-46	(727)	(620)
Reversal of the provision in respect of operations in Italy		54	723
<b>IMPAIRMENT NET OF REVERSALS</b>		<b>(752)</b>	<b>(640)</b>

(1) Including €(74) million for discontinued operations in 2012.

### 13.2 Impairment tests on goodwill and other assets and recognition of impairment

The following tables give details of impairment tests carried out on the main goodwill, intangible assets with indefinite useful lives and other Group assets in 2012, and the key assumptions used.

#### Impairment of goodwill and intangible assets with indefinite useful lives

Operating segment	Cash-Generating Unit or asset	WACC after tax	Growth rate beyond medium term plan	Impairment 2012 <i>(in millions of Euros)</i>
United Kingdom	EDF Energy – nuclear	7.2%	-	-
United Kingdom	EDF Energy – ESCS	7.2%	1.9%	-
Italy	Edison – Edison brand	7.5 to 7.8%	2%	-
Other international	EDF Luminus	6.6%	2%	-
Other activities	EDF Énergies Nouvelles CGU	12.3%	-	(37)
Other activities	Dalkia International	8.1%	2%	-
Other impairment of goodwill				(15)
<b>TOTAL</b>				<b>(52)</b>

### Impairment of other assets

Operating segment	Cash-Generating Unit or asset	Impairment indicators	WACC after tax	Growth rate beyond medium term plan	Impairment 2012 (in millions of Euros)
United Kingdom	EDF Energy – ESCS	Decline in sparkspreads (West Burton B plant) and sale of Sutton Bridge plant	7.2%	-	(234)
Italy	Edison CGU	Economic situation in Greece	15%	-	(44)
Other international	CENG	Decline in long-term electricity price scenarios	6.6%	-	(396)
Other impairment of assets					(26)
<b>TOTAL</b>					<b>(700)</b>

In 2011, impairment totalled €(640) million and mainly concerned Edison (€(320) million, principally relating to the sale of Edipower to Delmi) and Dalkia International (€(151) million, principally on renewable energy activities in Italy).

#### United Kingdom

EDF Energy's goodwill amounts to €8,339 million at 31 December 2012. Impairment testing is based on two different Cash Generating Units (CGUs):

- Nuclear activities, including power plants in operation and plans to develop new EPRs;
- Energy Sourcing and Customer Supply (ESCS), including development of the West Burton plant.

The recoverable value of the nuclear activities is estimated based on discounted future net cash flows from the generation units over their estimated useful life, taking into consideration the probable extension of the useful lives of the AGRs (Advanced Gas Reactors) and Sizewell B. The approval of the 7-year extensions for the Hinkley Point B and Hunterston B reactors in December 2012 confirms the validity of the assumptions adopted by the Group. The assumptions regarding electricity price movements in the United Kingdom take account of the need to develop new generation facilities to meet demand from 2020, especially due to retirement of existing coal-fired plants, and a recovery in nuclear power over the same horizon. The greenhouse gas emission rights prices used for the impairment tests were determined on a basis that reflects application of energy market reforms.

The recoverable value of the Nuclear CGU is sensitive to assumptions regarding long-term movements in electricity prices and WACC, mainly as a result of the operating lifetimes of nuclear plants, but using a WACC one half-point higher would not lead to impairment on this CGU. Also, if the number of EPRs constructed was reduced from 4 to 2 the recoverable value of the CGU would remain higher than its book value.

The recoverable value of ESCS is based on the value in use, determined by reference to the entity's 3-year medium-term plan. Terminal value is determined using an after-tax growth rate to infinity of 1.9%.

When it acquired British Energy in 2009, EDF Energy made a commitment to the European Commission to dispose of its investment in the Sutton Bridge gas plant. A sale agreement subject to conditions was signed in December 2012. The Sutton Bridge plant is recorded as discontinued operations at 31 December 2012 at its sale price less selling expenses, leading to recognition of impairment amounting to €74 million.

The West Burton plant is a 1,305 MW combined cycle gas plant scheduled to begin commercial operation in the first half of 2013. In view of the substantial decline in sparkspreads in 2012, the plant was subjected to an impairment test. Its recoverable value is estimated based on discounted cash flows over its expected useful life. Impairment testing on these bases led to recognition of impairment of €160 million in 2012.

#### Italy – Edison

After the takeover of Edison, finalised on 24 May 2012, and determination of the initial balance sheet for the purposes of the operation, the EDF group's consolidated financial statements no longer record any goodwill associated with the Edison subgroup (see note 3.1). However, since that date, an intangible asset with indefinite useful life of €945 million representing the Edison brand has been recognised in the consolidated financial statements.

In application of the Group's accounting policies as presented in note 1.3.15, the Edison brand was subjected to an impairment test that did not lead to recognition of any impairment. This test was based on cash flows from the medium-term plan, using an after-tax discount rate of 7.5% to 7.8%.

Impairment of €44 million was recorded in respect of other Edison assets in 2012 (including €20 million for fossil-fired generation assets in Greece).

### Other international

#### EDF Luminus

EDF Luminus' goodwill amounted to €383 million at 31 December 2012. For the purposes of impairment testing EDF Luminus is considered as a single cash-generating unit. The recoverable value is based on its value in use, determined using cash flows over 20 years and a terminal value.

Under the plan to withdraw from civil nuclear energy, confirmed by the Belgian government in July 2012, Belgian nuclear power plants are to close by 2025. For the purposes of determining cash flows, it was thus considered that the nuclear plants in which EDF Luminus holds investments will close by 2025, and that the electricity generated by those plants will be replaced by power from a combined cycle gas plant. The impairment test also assumes that electricity sale prices will decrease due to greater competition.

Impairment testing on these bases did not lead to recognition of any impairment in 2012.

#### CENG

The recoverable value of CENG's assets is estimated based on future cash flows over the estimated useful life of generation facilities. In the United States, the decline in gas prices as shale gas operations expanded caused a significant downturn in long-term electricity prices, which is an indication of

impairment. The impairment test was based on the economic assumptions that basic energy generation in the United States will be based on gas, obsolete power plants will be shut down and greenhouse gas regulation will remain at a modest level. On these bases, the impairment test led to recognition of impairment of €396 million in respect of CENG's assets.

### Other activities

#### Dalkia International

Dalkia International's goodwill amounted to €800 million at 31 December 2012. The recoverable value of assets is estimated based on values in use taken from the 5-year medium-term plan and a terminal value.

The impairment test did not lead to recognition of any impairment in 2012.

#### EDF Énergies Nouvelles

At 1 March 2012 EDF ENR Photowatt and PV Alliance joined EDF Énergies Nouvelles' scope of consolidation. It was decided to write off these companies' assets in full in the opening balance sheet due to the negative cash flows reflected in the medium-term plans.

Also, due to the macroeconomic situation in Greece, development activities in the country were halted until conditions improve. Goodwill for Greece has therefore been fully impaired.

## ➤ Note 14 Other income and expenses

Other income and expenses in 2012 include:

- income of €160 million concerning ERDF, resulting from reversal of a provision for renewal following a change in estimate for the useful life of high/low voltage transformers (extended from 30 years to 40 years);
- the effects of the Group's takeover of Edison, amounting to €(58) million. Details of the impacts of this operation are presented in note 3.1;
- a net expense of €(70) million associated with revision of the estimated costs for decommissioning permanently shut-down nuclear power plants in France (UNGG power plants, Creys-Malville, Brennilis and Chooz A), and the revision of certain costs associated with interim storage of spent fuel – see note 29.1.

Other income and expenses in 2011 included:

- income of €414 million corresponding to reversals from provisions for renewal of ERDF's concession assets, following a change in estimate for the useful life of low-voltage twisted overhead pipes (extended from 40 to 50 years);
- income of €327 million corresponding to the gain on sale of EnBW.

## ➤ Note 15 Financial result

### 15.1 Cost of gross financial indebtedness

Details of the components of the cost of gross financial indebtedness are as follows:

(in millions of Euros)	2012	2011
Interest expenses on financing operations	(2,538)	(2,284)
Change in the fair value of derivatives and hedges of liabilities	39	(5)
Transfer to income of changes in the fair value of cash flow hedges	(39)	(3)
Net foreign exchange gain on indebtedness	95	21
<b>COST OF GROSS FINANCIAL INDEBTEDNESS</b>	<b>(2,443)</b>	<b>(2,271)</b>

The rise in interest expenses in 2012 reflects the higher average gross financial indebtedness over the year.

## 15.2 Discount effect

The discount effect primarily concerns provisions for the back-end nuclear cycle, decommissioning and last cores, and long-term and post-employment employee benefits.

Details of this expense are as follows:

<i>(in millions of Euros)</i>	2012	2011
Provisions for long-term and post-employment employee benefits	(1,392)	(1,337)
Provisions for back-end nuclear cycle, decommissioning and last cores	(1,889)	(1,554)
Other provisions and advances	(4)	(173)
<b>DISCOUNT EFFECT</b>	<b>(3,285)</b>	<b>(3,064)</b>

The higher discount effect in 2012 on provisions for back-end nuclear cycle, decommissioning and last cores generated a €(244) million expense related to revision of the discount rate for France (see note 29.1.5).

Following termination of the industrial nuclear partnership between EDF and ENEL, the discount effect on other provisions and advances in 2012 includes income of €101 million resulting from reversal of discount expenses on advances received from ENEL, which were reimbursed at the end of the year.

## 15.3 Other financial income and expenses

Other financial income and expenses comprise:

<i>(in millions of Euros)</i>	2012	2011
Financial income on cash and cash equivalents	38	44
Gains (losses) on available-for-sale financial assets	708	137
Gains (losses) on other financial assets	968	568
Changes in financial instruments carried at fair value with changes in fair value included in income	(70)	86
Other financial expenses	(245)	(95)
Foreign exchange gain/loss on financial items other than debts	(93)	(36)
Return on hedging assets	635	597
Capitalised borrowing costs	425	254
<b>OTHER FINANCIAL INCOME AND EXPENSES</b>	<b>2,366</b>	<b>1,555</b>

Gains net of expenses on available-for-sale financial assets include gains on disposals, interest income, and dividends.

The gain on other financial assets at 31 December 2012 includes an amount of €629 million for accumulated prior costs borne in connection with the CSPE system (see note 4.1).

The fair value of Veolia Environnement shares at 31 December 2011 was more than 50% lower than their historical value, and as a result impairment of €(340) million was recorded against available-for-sale financial assets.

In 2011, "Gains (losses) on other financial assets" included income of €232 million resulting from a debt waiver by the CEA (French Atomic Energy commission), relating to a loan from the CEA to EDF for construction of the Creys-Malville plant.

## ➤ Note 16 Income taxes

### 16.1 Breakdown of tax expense

Details are as follows:

<i>(in millions of Euros)</i>	2012	2011
Current tax expense	(1,619)	(1,690)
Deferred taxes	33	354
<b>TOTAL</b>	<b>(1,586)</b>	<b>(1,336)</b>

In 2012, €(1,058) million of the current tax expense relates to EDF's tax consolidated group in France, and €(561) million relates to other subsidiaries (€(1,005) million and €(685) million respectively in 2011).

### 16.2 Reconciliation of the theoretical and effective tax expense (tax proof)

<i>(in millions of Euros)</i>	2012	2011
Income of consolidated companies before tax	4,883	4,672
Income tax rate applicable to the parent company	36.10%	36.10%
<b>Theoretical tax expense</b>	<b>(1,763)</b>	<b>(1,687)</b>
Differences in tax rate	349	329
Permanent differences	(62)	65
Taxes without basis	49	(78)
Depreciation of deferred tax assets	(167)	36
Other	8	(1)
<b>ACTUAL TAX EXPENSE</b>	<b>(1,586)</b>	<b>(1,336)</b>
<b>EFFECTIVE TAX RATE</b>	<b>32.48%</b>	<b>28.60%</b>

The effective tax rate for 2012 and 2011 was driven up by impairment. After adjustment for this factor, the effective tax rate is 29.1% and 26.4% respectively for 2012 and 2011.

The main factors explaining the difference between the theoretical tax rate and the effective rate are:

- 2012:
  - the positive impact of differences in tax rates applicable to foreign subsidiaries (€349 million), including €177 million related to the 2-point drop in tax rates in the UK.
- 2011:
  - the positive impact of differences in tax rates applicable to foreign subsidiaries (€329 million), including €177 million related to the 2-point drop in tax rates in the UK;
  - the positive effect of reversals of depreciation of deferred tax assets (€119 million), mainly in the French tax consolidation group.



## 16.3 Change in deferred tax assets and liabilities

<i>(in millions of Euros)</i>	2012	2011
Deferred tax assets	3,159	2,577
Deferred tax liabilities	(4,479)	(4,894)
<b>NET DEFERRED TAXES AT 1 JANUARY</b>	<b>(1,320)</b>	<b>(2,317)</b>
Change in net income	34	354
Change in equity	506	671
Translation adjustments	(53)	(64)
Changes in scope of consolidation	(1,357)	(18)
Other movements	76	54
<b>NET DEFERRED TAXES AT 31 DECEMBER</b>	<b>(2,114)</b>	<b>(1,320)</b>
Deferred tax assets	3,487	3,159
Deferred tax liabilities	(5,601)	(4,479)

€550 million of the change in 2012 in deferred tax assets included in equity results from the change in actuarial gains and losses on post-employment benefits (€251 million in 2011).

## 16.4 Breakdown of deferred tax assets and liabilities by nature

<i>(in millions of Euros)</i>	31/12/2012	31/12/2011
<b>Deferred tax assets:</b>		
Differences between depreciation recorded for accounting and tax purposes	185	83
Non-deductible provisions for pension obligations	6,318	4,804
Other non-deductible provisions	731	546
Other deductible temporary differences	1,257	1,214
Revaluations, revaluation surplus and elimination of intercompany profit	656	622
Tax losses and unused tax credits	872	720
Netting of deferred tax assets and liabilities	(3,793)	(3,338)
<b>Deferred tax assets</b>	<b>6,226</b>	<b>4,651</b>
Unrecorded deferred tax assets	(2,739)	(1,492)
<b>Deferred tax assets in balance sheet</b>	<b>3,487</b>	<b>3,159</b>
<b>Deferred tax liabilities:</b>		
Differences between depreciation recorded for accounting and tax purposes	(5,570)	(5,785)
Other taxable temporary differences	(849)	(510)
Revaluations, revaluation surplus and elimination of intercompany profit	(2,975)	(1,522)
Netting of deferred tax assets and liabilities	3,793	3,338
<b>Deferred tax liabilities in balance sheet</b>	<b>(5,601)</b>	<b>(4,479)</b>
<b>NET DEFERRED TAXES</b>	<b>(2,114)</b>	<b>(1,320)</b>

At 31 December 2012, unrecorded deferred tax assets represent a potential tax saving of €2,739 million (€1,492 million at 31 December 2011). Of the potential tax saving in 2012, €1,831 million relates to deferred tax assets, mainly on employee benefits in France. This is significantly higher than in 2011 (€734 million) due to the change in actuarial gains and losses recorded in equity in 2012.

## ➤ Note 17 Basic earnings per share and diluted earnings per share

The diluted earnings per share is calculated by dividing the Group's share of net income, corrected for dilutive instruments, by the weighted average number of potential shares outstanding over the period after elimination of treasury shares.

At 31 December 2012, there are no dilutive instruments in the EDF group.

The following table shows the reconciliation of the basic and diluted earnings used to calculate earnings per share (basic and diluted), and the variation in the weighted average number of shares used in calculating basic and diluted earnings per share:

<i>(in millions of Euros)</i>	<b>2012</b>	2011
Net income attributable to ordinary shares	3,316	3,148
Effect of dilutive instruments	-	-
Net income used to calculated diluted earnings per share	3,316	3,148
Average weighted number of ordinary shares outstanding during the year	1,847,342,956	1,847,318,156
Average weighted number of diluted shares outstanding during the year	1,847,342,956	1,847,318,156
Earnings per share (in Euros):		
<b>EARNINGS PER SHARE</b>	<b>1.80</b>	<b>1.70</b>
<b>DILUTED EARNINGS PER SHARE</b>	<b>1.80</b>	<b>1.70</b>

## OPERATING ASSETS AND LIABILITIES, EQUITY

### ➤ Note 18 Goodwill

#### 18.1 Changes in goodwill

Goodwill on consolidated entities comprises the following:

<i>(in millions of Euros)</i>	31/12/2012	31/12/2011
<b>Net book value at opening date</b>	<b>11,648</b>	<b>12,028</b>
Acquisitions	129	21
Disposals	-	(14)
Impairment (note 13)	(52)	(655)
Translation adjustments	209	239
Changes in scope of consolidation and other	(1,522)	29
<b>NET BOOK VALUE AT CLOSING DATE</b>	<b>10,412</b>	<b>11,648</b>
Gross value at closing date	11,079	12,775
Accumulated impairment at closing date	(667)	(1,127)

The changes in goodwill in 2012 primarily relate to:

- acquisitions, including €89 million recognised after the takeover of Enerest by Électricité de Strasbourg (see note 5.3);
- translation adjustments of €209 million, largely due to the rise of the Pound sterling against the Euro;
- changes in the scope of consolidation, including €(1,400) million for the derecognition of Edison's historical goodwill following determination of the fair value of the assets acquired and liabilities assumed in the takeover operation of 24 May 2012.

The changes in goodwill in 2011 primarily related to:

- impairment amounting to €(655) million, mainly concerning Edison and Dalkia;
- translation adjustments of €239 million, largely due to the rise of the pound sterling against the Euro.

#### 18.2 Goodwill by operating segment

The breakdown of goodwill is as follows:

<i>(in millions of Euros)</i>	31/12/2012	31/12/2011
EDF Energy	8,339	8,260
<b>Total United Kingdom</b>	<b>8,339</b>	<b>8,260</b>
Edison	-	1,400
<b>Total Italy</b>	<b>-</b>	<b>1,400</b>
EDF Luminus (Belgium)	383	378
ESTAG (Austria)	112	112
Other	110	109
<b>Total Other International</b>	<b>605</b>	<b>599</b>
Dalkia International	800	799
EDF Énergies Nouvelles	195	209
Other	473	381
<b>Total Other activities</b>	<b>1,468</b>	<b>1,389</b>
<b>GROUP TOTAL</b>	<b>10,412</b>	<b>11,648</b>

## ➤ Note 19 Other intangible assets

The net value of other intangible assets breaks down as follows:

At 31 December 2012

(in millions of Euros)	31/12/2011	Acquisitions	Disposals	Translation adjustments	Changes in scope	Other movements	31/12/2012
Software	1,665	251	(149)	(3)	(21)	29	1,772
Positive fair value of commodity contracts acquired in a business combination	704	-	(29)	(1)	245	(46)	873
Greenhouse gas emission rights – green certificates	366	681	(597)	3	65	(2)	516
Other intangible assets	2,926	220	(9)	34	1,658	203	5,032
Intangible assets in development	1,303	357	-	(1)	-	112	1,771
<b>Gross values</b>	<b>6,964</b>	<b>1,509</b>	<b>(784)</b>	<b>32</b>	<b>1,947</b>	<b>296</b>	<b>9,964</b>
Accumulated amortisation and impairment	(2,262)	(659)	160	(6)	626	(198)	(2,339)
<b>NET VALUES</b>	<b>4,702</b>	<b>850</b>	<b>(624)</b>	<b>26</b>	<b>2,573</b>	<b>98</b>	<b>7,625</b>

Changes in scope mainly concern the effects of the takeover of the Edison group, particularly recognition of the Edison brand at the value of €945 million, and intangible assets related to hydropower concessions for an amount of €1,165 million. For more details, see note 3.1.4.

Impairment of €(27) million was recorded in respect of other intangible assets in 2012.

At 31 December 2011 (in millions of Euros)	31/12/2010	Acquisitions	Disposals	Translation adjustments	Changes in scope	Other movements	31/12/2011
<b>Gross values</b>	<b>6,509</b>	<b>1,216</b>	<b>(777)</b>	<b>25</b>	<b>(8)</b>	<b>(1)</b>	<b>6,964</b>
Accumulated amortisation and impairment	(1,893)	(493)	183	(6)	13	(66)	(2,262)
<b>NET VALUES</b>	<b>4,616</b>	<b>723</b>	<b>(594)</b>	<b>19</b>	<b>5</b>	<b>(67)</b>	<b>4,702</b>

Impairment of €(88) million was booked on other intangible assets in 2011.

EDF's research and development expenses recorded in the income statement total €527 million for 2012 (€518 million for 2011).

## ➤ Note 20 Property, plant and equipment operated under French public electricity distribution concessions

### 20.1 Net value of property, plant and equipment operated under French public electricity distribution concessions

(in millions of Euros)	31/12/2012	31/12/2011
Property, plant and equipment	45,919	44,342
Property, plant and equipment in progress	1,303	1,159
<b>PROPERTY, PLANT AND EQUIPMENT OPERATED UNDER FRENCH PUBLIC ELECTRICITY DISTRIBUTION CONCESSIONS</b>	<b>47,222</b>	<b>45,501</b>

## 20.2 Movements in property, plant and equipment operated under French public electricity distribution concessions (excluding assets in progress)

(in millions of Euros)	Land and buildings	Networks	Other installations, plant, machinery, equipment & other	Total
Gross value at 31/12/2011	2,138	72,345	3,158	77,641
Increases <sup>(1)</sup>	99	3,452	303	3,854
Decreases	(18)	(431)	(129)	(578)
Other movements	(5)	1	(1)	(5)
<b>Gross value at 31/12/2012</b>	<b>2,214</b>	<b>75,367</b>	<b>3,331</b>	<b>80,912</b>
Depreciation and impairment at 31/12/2011	(1,164)	(30,066)	(2,069)	(33,299)
Net depreciation	(37)	(184)	(129)	(350)
Disposals	16	344	127	487
Other movements <sup>(2)</sup>	(6)	(1,736)	(89)	(1,831)
<b>Depreciation and impairment at 31/12/2012</b>	<b>(1,191)</b>	<b>(31,642)</b>	<b>(2,160)</b>	<b>(34,993)</b>
<b>Net values at 31/12/2011</b>	<b>974</b>	<b>42,279</b>	<b>1,089</b>	<b>44,342</b>
<b>NET VALUES AT 31/12/2012</b>	<b>1,023</b>	<b>43,725</b>	<b>1,171</b>	<b>45,919</b>

(1) Increases also include facilities provided by the concession grantors.

(2) Other movements mainly concern depreciation of assets operated under concessions, booked against amortisation recorded in the special concession liabilities.

## ➤ Note 21 Property, plant and equipment operated under concessions for other activities

### 21.1 Net value of property, plant and equipment operated under concessions for other activities

The net value of property, plant and equipment operated under concessions for other activities breaks down as follows:

(in millions of Euros)	31/12/2012	31/12/2011
Property, plant and equipment	6,256	5,326
Property, plant and equipment in progress	926	696
<b>PROPERTY, PLANT AND EQUIPMENT OPERATED UNDER CONCESSIONS FOR OTHER ACTIVITIES</b>	<b>7,182</b>	<b>6,022</b>



## 21.2 Movements in property, plant and equipment operated under concessions for other activities (excluding assets in progress)

	Land and buildings	Fossil-fired & hydropower plants	Networks	Other installations, plant, machinery, equipment & other	Total
<i>(in millions of Euros)</i>					
Gross value at 31/12/2011	1,240	9,234	524	1,187	12,185
Increases	32	338	38	42	450
Decreases	(3)	(22)	(5)	(9)	(39)
Translation adjustments	2	(6)	37	5	38
Changes in the scope of consolidation	41	142	-	(1)	182
Other movements	10	(20)	-	(1)	(11)
<b>Gross value at 31/12/2012</b>	<b>1,322</b>	<b>9,666</b>	<b>594</b>	<b>1,223</b>	<b>12,805</b>
Depreciation and impairment at 31/12/2011	(787)	(5,091)	(261)	(720)	(6,859)
Net depreciation	(24)	(270)	(20)	(46)	(360)
Impairment net of reversals	(1)	(8)	-	-	(9)
Disposals	2	17	5	8	32
Translation adjustments	-	2	(18)	1	(15)
Changes in the scope of consolidation	17	616	-	4	637
Other movements	(1)	25	-	1	25
<b>Depreciation and impairment at 31/12/2012</b>	<b>(794)</b>	<b>(4,709)</b>	<b>(294)</b>	<b>(752)</b>	<b>(6,549)</b>
Net value at 31/12/2011	453	4,143	263	467	5,326
<b>NET VALUE AT 31/12/2012</b>	<b>528</b>	<b>4,957</b>	<b>300</b>	<b>471</b>	<b>6,256</b>

At 31 December 2012, property, plant and equipment operated under concessions other than French public electricity distribution concessions comprise concession facilities mainly located in France (hydropower) and Italy.

Changes in the scope of consolidation in 2012 concern the takeover of Edison.

## ➤ Note 22 Property, plant and equipment used in generation and other tangible assets owned by the Group

### 22.1 Net value of property, plant and equipment used in generation and other tangible assets owned by the Group

The net value of property, plant and equipment used in generation and other tangible assets owned by the Group breaks down as follows:

<i>(in millions of Euros)</i>	31/12/2012	31/12/2011
Property, plant and equipment	51,392	47,184
Property, plant and equipment in progress	16,130	12,951
Finance-leased property, plant and equipment	316	310
<b>PROPERTY, PLANT AND EQUIPMENT USED IN GENERATION AND OTHER TANGIBLE ASSETS OWNED BY THE GROUP</b>	<b>67,838</b>	<b>60,445</b>

At 31 December 2012, property, plant and equipment in progress primarily concern EPR construction projects in France and the United Kingdom. Impairment of €(10) million was also recorded in 2012 in respect of property, plant and equipment in progress (€(29) million in 2011).

## 22.2 Movements in property, plant and equipment used in generation and other tangible assets owned by the Group (excluding assets in progress and finance-leased assets)

(in millions of Euros)	Land and buildings	Nuclear power plants	Fossil-fired & hydropower plants	Networks	Other installations, plant, machinery & equipment & other	Total
<b>Gross value at 31/12/2011</b>	<b>11,581</b>	<b>63,043</b>	<b>14,904</b>	<b>821</b>	<b>13,173</b>	<b>103,522</b>
Increases	231	2,195	1,165	51	2,844	6,486
Decreases	(275)	(818)	(104)	(3)	(269)	(1,469)
Translation adjustments	96	155	196	-	1	448
Changes in the scope of consolidation	272	-	1,565	(2)	(535)	1,300
Other movements	23	(371)	143	-	(307)	(512)
<b>Gross value at 31/12/2012</b>	<b>11,928</b>	<b>64,204</b>	<b>17,869</b>	<b>867</b>	<b>14,907</b>	<b>109,775</b>
<b>Depreciation and impairment at 31/12/2011</b>	<b>(6,275)</b>	<b>(35,785)</b>	<b>(8,734)</b>	<b>(430)</b>	<b>(5,114)</b>	<b>(56,338)</b>
Net depreciation	(319)	(2,081)	(691)	(27)	(863)	(3,981)
Impairment net of reversals	(4)	(357)	(198)	-	(75)	(634)
Disposals	109	647	93	3	250	1,102
Translation adjustments	(38)	(30)	(116)	-	(32)	(216)
Changes in the scope of consolidation	12	-	1,083	1	18	1,114
Other movements	15	568	(84)	4	67	570
<b>Depreciation and impairment at 31/12/2012</b>	<b>(6,500)</b>	<b>(37,038)</b>	<b>(8,647)</b>	<b>(449)</b>	<b>(5,749)</b>	<b>(58,383)</b>
<b>Net value at 31/12/2011</b>	<b>5,306</b>	<b>27,258</b>	<b>6,170</b>	<b>391</b>	<b>8,059</b>	<b>47,184</b>
<b>NET VALUE AT 31/12/2012</b>	<b>5,428</b>	<b>27,166</b>	<b>9,222</b>	<b>418</b>	<b>9,158</b>	<b>51,392</b>

Changes in the scope of consolidation in 2012 mainly concern the takeover of Edison during the year.

The lower level of depreciation on nuclear generation facilities in 2012 is primarily explained by the 5-year and 7-year extensions of the operating lifetimes of certain nuclear power plants in the United Kingdom.

In France, the amount of property, plant and equipment rose due to expenses incurred to improve the performance of nuclear units. The reinforced management plan also enhanced monitoring of general maintenance expenditure and scheduled checks carried out at regular intervals. These checks qualify as major inspections and the related costs are capitalised.

## 22.3 Finance lease contracts

(in millions of Euros)	Total	31/12/2012			31/12/2011
		Maturity			Total
		< 1 year	1 to 5 years	> 5 years	
Future minimum lease payments receivable as lessor	58	16	35	7	60
Future minimum lease payments payable as lessee	478	39	130	309	149

The Group is the lessor in agreements classified as finance leases under IFRIC 4 and IAS 17, which account for almost all of its finance lease commitments as lessor.

The Group is bound as lessee by irrevocable finance lease contracts for premises, equipment and vehicles used in the course of its business. The corresponding payments are subject to renegotiation at intervals defined in the contracts.

## ➤ Note 23 Investments in associates

Investments in associates are as follows:

(in millions of Euros)	Principal activity <sup>(1)</sup>	31/12/2012			31/12/2011	
		Ownership %	Share of net equity	Share of net income	Share of net equity	Share of net income
RTE Réseau de Transport d'Électricité	T	100.00	4,786	407	4,620	272
Alpiq	G	25.00	1,203	(201)	1,396	(276)
Taishan	G	30.00	693	-	688	-
Dalkia Holding	O	34.00	422	(1)	443	23
NTPC	G	40.00	123	27	125	23
Other investments in associates			328	28	272	9
<b>TOTAL</b>			<b>7,555</b>	<b>260</b>	<b>7,544</b>	<b>51</b>

(1) G = generation, T = transmission, O = Other.

### 23.1 RTE Réseau de transport d'Électricité (RTE)

#### 23.1.1 RTE - Financial indicators

The key financial indicators for RTE for 2012 are as follows:

(in millions of Euros)	
Operating profit before depreciation and amortisation	1,610
Net income	407
Equity at 31 December 2012	4,786
Balance sheet total at 31 December 2012	15,625
Net indebtedness at 31 December 2012	6,875

#### 23.1.2 Transactions between the EDF group and RTE

At 31 December 2012 the main transactions between the EDF group and RTE were as follows.

##### Sales

ERDF uses RTE's high-voltage and very high-voltage networks to convey energy from its point of generation to the distribution networks. This service generated €3,239 million in sales revenues for RTE from ERDF over 2012.

In executing its responsibility to ensure balance in the electricity system, during 2012 RTE also undertook:

- energy purchases and sales with EDF, amounting to €181 million and €205 million respectively;
- system service purchases from EDF amounting to €285 million.

##### Other transactions

The EDF group contributes to financing of RTE through loans amounting to a total of €1,174 million at 31 December 2012 (€1,400 million at 31 December 2011). RTE recorded a total of €65 million in interest expenses on this loan in 2012.

RTE is also included in the EDF group tax consolidation, under a tax consolidation agreement between the two companies.

### 23.2 Alpiq

#### 23.2.1 Published financial indicators

The main published indicators by the Alpiq group for 2011 were as follows:

(in millions of Euros)	
2011 Sales	11,334
2011 Net income	(1,093)
Equity at 31 December 2011	5,104
Balance sheet total at 31 December 2011	14,352

#### 23.2.2 Impairment

On 14 December 2012, Alpiq announced that further adjustments would be necessary in view of the difficult market conditions and significant changes in the European energy environment, leading it to step up its cost-cutting programme and recognise additional impairment of €(248) million (EDF's share) in 2012. This impairment is recorded by Alpiq and particularly concerns assets in Switzerland and Italy.

This announcement followed Alpiq's move to refocus business on Switzerland and certain international sectors, initiated in 2011. Impairment of €(320) million (EDF's share) was recognised in investments in associates in the Group's 2011 consolidated financial statements. It was recorded by Alpiq in its consolidated accounts, and mainly concerned its investments in Romande Énergie in Switzerland, and Edipower and A2A in Italy.

## ➤ Note 24 Inventories

The carrying value of inventories, broken down by nature, is as follows:

(in millions of Euros)	31/12/2012			31/12/2011		
	Gross value	Provisions	Net value	Gross value	Provisions	Net value
Nuclear fuel	10,297	(15)	10,282	9,848	(13)	9,835
Other fuel	2,104	(4)	2,100	1,963	(8)	1,955
Other raw materials	1,298	(217)	1,081	1,095	(196)	899
Work-in-progress for production of goods and services	216	(30)	186	553	(11)	542
Other inventories	625	(61)	564	378	(28)	350
<b>TOTAL INVENTORIES</b>	<b>14,540</b>	<b>(327)</b>	<b>14,213</b>	<b>13,837</b>	<b>(256)</b>	<b>13,581</b>

The long-term portion (more than one year) mainly concerns nuclear fuel inventories amounting to €7,591 million at 31 December 2012 (€6,778 million at 31 December 2011).

The value of EDF Trading's inventories stated at market value is €764 million at 31 December 2012 (€943 million at 31 December 2011).

## ➤ Note 25 Trade receivables

Details of net trade receivables are as follows:

(in millions of Euros)	31/12/2012	31/12/2011
Trade receivables, gross value – excluding EDF Trading	20,518	17,962
Trade receivables, gross value – EDF Trading	2,927	3,613
Impairment	(948)	(667)
<b>TRADE RECEIVABLES, NET VALUE</b>	<b>22,497</b>	<b>20,908</b>

Most trade receivables mature within one year.

The credit risk on trade receivables is shown below:

(in millions of Euros)	31/12/2012			31/12/2011		
	Gross value	Impairment	Net values	Gross value	Impairment	Net values
<b>TRADE RECEIVABLES</b>	<b>23,445</b>	<b>(948)</b>	<b>22,497</b>	<b>21,575</b>	<b>(667)</b>	<b>20,908</b>
overdue by up to 6 months	2,144	(251)	1,893	2,019	(193)	1,826
overdue by 6-12 months	688	(211)	477	506	(125)	381
overdue by more than 12 months	1,046	(408)	638	670	(278)	392
<b>Trade receivables due</b>	<b>3,878</b>	<b>(870)</b>	<b>3,008</b>	<b>3,195</b>	<b>(596)</b>	<b>2,599</b>
<b>Trade receivables not yet due</b>	<b>19,567</b>	<b>(78)</b>	<b>19,489</b>	<b>18,380</b>	<b>(71)</b>	<b>18,309</b>

The changes observed in 2012 include the effect of full consolidation of Edison since 24 May 2012.

The Group undertook securitisation of trade receivables for a total of €1,185 million in December 2012, including €774 by the Edison group.

As most securitisation operations are carried out on a recurrent, without-recourse basis, the corresponding receivables are not carried in the Group's consolidated balance sheet.

## ➤ Note 26 Other receivables

Details of other receivables are as follows:

<i>(in millions of Euros)</i>	<b>31/12/2012</b>	31/12/2011
Prepaid expenses	1,621	621
CSPE	997	3,821
VAT receivables	2,001	1,869
Other tax receivables	678	595
Other operating receivables	3,189	3,403
<b>OTHER RECEIVABLES</b>	<b>8,486</b>	<b>10,309</b>
Gross value	8,583	10,363
Impairment	(97)	(54)

Most other receivables mature within one year.

Prepaid expenses in 2012 include past payments for future spent fuel management services, with a corresponding entry in provisions for nuclear generation (see note 29).

At 31 December 2012, the CSPE receivable included in "Other receivables" mainly corresponds to the CSPE to be collected on energy supplied but not yet billed. Under the agreement signed with the French authorities, an amount of €4,250 million corresponding to the shortfall in CSPE compensation at 31 December 2012 has been reclassified as a financial asset (see note 4.1).

## ➤ Note 27 Equity

### 27.1 Share capital

At 31 December 2012, the share capital amounted to €924,433,331, comprising 1,848,866,662 fully subscribed and paid-up shares with nominal value of €0.50 each, owned 84.4% by the French State, 13.6% by the public (institutional and private investors) and 1.9% by current and retired Group employees, with 0.1% held by EDF as treasury shares.

Article 24 of the law of 9 August 2004 requires the State to hold more than 70% of the capital of EDF at all times.

### 27.2 Treasury shares

A share repurchase program authorised by the General Shareholders' Meeting of 9 June 2006 was implemented by the Board of Directors, within the limits of 10% of the total number of shares making up the Company's capital. The initial duration of the program was 18 months, renewed for 12 months then by tacit agreement every year.

Under this share repurchase program, for which a liquidity contract exists as required by the market regulator AMF, 8,398,898 shares were acquired during 2012 for a total of €134 million, and 7,413,159 shares were sold for a total of €119 million.

At 31 December 2012, treasury shares deducted from consolidated equity represent 2,161,333 shares with total value of €33 million.

### 27.3 Dividends

The General Shareholders' Meeting of 24 May 2012 decided to distribute a dividend of €1.15 per share in circulation in respect of 2011. Interim dividends of €0.57 per share had been paid out on 16 December 2011, and the balance of €0.58 per share amounting to a total of €1,072 million was paid out on 6 June 2012.

On 22 November 2012, the Board of Directors decided to distribute an interim dividend of €0.57 per share or a total of €1,053 million for 2012, paid out in cash on 17 December 2012.

In keeping with the amendment to the company's articles of association proposed at the General Shareholders' Meeting of 24 May 2011, shareholders who have held their shares continuously for at least 2 years at the year-end date and still hold them at the dividend distribution date are entitled to a 10% increase in their dividends. The number of shares eligible for this increase cannot be more than 0.5% of the company's capital for a single shareholder. This amendment will take effect for the payment in 2014 of the dividend for the year 2013.



## ➤ Note 28 Provisions

The breakdown between current and non-current provisions is as follows:

(in millions of Euros)	Notes	31/12/2012			31/12/2011		
		Current	Non-current	Total	Current	Non-current	Total
Provisions for back-end nuclear cycle		1,094	18,431	19,525	1,302	17,528	18,830
Provisions for decommissioning and last cores		225	20,754	20,979	173	19,670	19,843
<b>Provisions related to nuclear generation</b>	29	<b>1,319</b>	<b>39,185</b>	<b>40,504</b>	<b>1,475</b>	<b>37,198</b>	<b>38,673</b>
Provisions for decommissioning of non-nuclear facilities	30	45	1,090	1,135	41	809	850
Provisions for employee benefits	31	912	19,540	20,452	940	14,611	15,551
Other provisions	32	1,618	1,873	3,491	1,606	1,338	2,944
<b>TOTAL PROVISIONS</b>		<b>3,894</b>	<b>61,688</b>	<b>65,582</b>	<b>4,062</b>	<b>53,956</b>	<b>58,018</b>

## ➤ Note 29 Provisions related to nuclear generation – back-end nuclear cycle, plant decommissioning and last cores

Provisions related to nuclear generation comprise provisions for back-end nuclear cycle expenses (management of spent fuel and radioactive waste), provisions for plant decommissioning and provisions for last cores.

Provisions are estimated under the principles presented in note 1.3.2.1.

Obligations can vary noticeably depending on each country's legislation and regulations, and the technologies and industrial practices used in each company.

The movement in provisions for back-end nuclear cycle, provisions for decommissioning and provisions for last cores breaks down as follows:

(in millions of Euros)	31/12/2011	Increases	Decreases		Changes in scope	Other movements	31/12/2012
			Utilisations	Reversals			
Provisions for spent nuclear fuel management	11,530	337	(647)	(21)	-	618	11,817
Provisions for long-term radioactive waste management	7,300	511	(150)	-	-	47	7,708
<b>Provisions for back-end nuclear cycle</b>	<b>18,830</b>	<b>848</b>	<b>(797)</b>	<b>(21)</b>	<b>-</b>	<b>665</b>	<b>19,525</b>
Provisions for nuclear plant decommissioning	16,430	1,262	(234)	-	-	(30)	17,428
Provisions for last cores	3,413	167	-	-	-	(29)	3,551
<b>Provisions for decommissioning and last cores</b>	<b>19,843</b>	<b>1,429</b>	<b>(234)</b>	<b>-</b>	<b>-</b>	<b>(59)</b>	<b>20,979</b>
<b>PROVISIONS RELATED TO NUCLEAR GENERATION</b>	<b>38,673</b>	<b>2,277</b>	<b>(1,031)</b>	<b>(21)</b>	<b>-</b>	<b>606</b>	<b>40,504</b>

Other changes in provisions related to nuclear generation principally reflect the following effects:

- €(289) million corresponding to the change in amounts reimbursable by the NLF (Nuclear Liabilities Fund) and the British government for coverage of EDF Energy's long-term nuclear obligations (see note 36.4) of which €(616) million result from the 5-year and 7-year extensions to certain nuclear plants' operating lifetimes in 2012;
- €665 million in provisions for spent fuel management relating to future services, with a corresponding entry in prepaid expenses (net income for the period is unaffected).

The breakdown of provisions by company is shown below:

	EDF	EDF Energy	CENG	Other entities	Total
(in millions of Euros)	Note 29.1	Note 29.2	Note 29.3	Note 29.4	
Provisions for spent fuel management	9,498	2,319	-	-	11,817
Provisions for long-term radioactive waste management	7,113	594	-	1	7,708
<b>PROVISIONS FOR BACK-END NUCLEAR CYCLE AT 31/12/2012</b>	<b>16,611</b>	<b>2,913</b>	<b>-</b>	<b>1</b>	<b>19,525</b>
Provisions for back-end nuclear cycle at 31/12/2011	15,865	2,962	-	3	18,830
Provisions for nuclear plant decommissioning	12,578	4,180	498	172	17,428
Provisions for last cores	2,193	1,309	49	-	3,551
<b>PROVISIONS FOR DECOMMISSIONING AND LAST CORES AT 31/12/2012</b>	<b>14,771</b>	<b>5,489</b>	<b>547</b>	<b>172</b>	<b>20,979</b>
Provisions for decommissioning and last cores at 31/12/2011	13,378	5,791	519	155	19,843

The decline in EDF Energy's provisions for decommissioning and last cores over 2012 results from the 5-year and 7-year extensions to certain nuclear plants' operating lifetime (€(616) million for decommissioning and €(185) million for last cores).

## 29.1 Nuclear provisions in France

In France, EDF's provisions are calculated in accordance with the instructions of the law of 28 June 2006 and its implementing provisions.

In compliance with the regulation on secure financing of nuclear expenses:

- EDF books provisions to cover all obligations related to the nuclear facilities it operates;
- EDF is building up a portfolio of dedicated assets for secure financing of long-term obligations (see note 48).

The relevant expenses are estimated based on the economic conditions of the year-end, then spread over a forecast disbursement schedule and adjusted to Euros of the year of payment through application of a forecast long-term inflation rate. To determine the provisions, these amounts are discounted to present value using a nominal discount rate.

### 29.1.1 Provisions for spent fuel management

These provisions cover services in connection with the following:

- removal of spent fuel from EDF's generation centres, as well as reception and interim storage;
- processing, including conditioning and storage of recyclable matter and waste resulting from this processing.

Processing expenses exclusively concern spent fuel that can be recycled in existing facilities, including the portion in reactors but not yet irradiated.

Expenses are calculated based on forecast physical flows at the closing date. Valuation is based on the contracts signed with AREVA.

At 31 December 2012, the provision for spent fuel management includes the favourable effects of revision of certain costs for interim storage of spent fuel.

### 29.1.2 Provisions for long-term radioactive waste management

This includes future expenses for:

- removal and storage of radioactive waste resulting from decommissioning of regulated nuclear installations operated by EDF;
- removal and storage of radioactive waste packages resulting from spent fuel processing at La Hague;
- long-term and direct storage of spent fuel that cannot be recycled on an industrial scale in existing installations: plutonium or uranium fuel derived from enriched processing, fuel from Creys-Malville and Brennilis;
- EDF's share of the costs of studies, coverage, shutdown and surveillance of storage centres:
  - existing centres, for very low-level waste, and low and medium-level waste;
  - new centres to be opened, for long-life low-level waste and long-life medium and high-level waste.

The volumes of waste concerned by provisions include existing packages of waste and all waste to be conditioned, resulting from plant decommissioning or spent fuel processing at La Hague (based on all fuel in reactors at 31 December irradiated or otherwise). These volumes are regularly reviewed, in keeping with the data declared for the purposes of the national waste inventory undertaken by the French agency for radioactive waste management ANDRA (*Agence nationale pour la gestion des déchets radioactifs*).

The provision for long-life medium and high-level waste is the largest component of the provisions for long-term radioactive waste management. The French Law of 28 June 2006 on the sustainable management of radioactive materials and waste has confirmed the assumption of geological storage used by EDF in calculating these provisions.

Since 2005, the gross value and disbursement schedules for forecast expenses have been based on a scenario of industrial geological waste storage, following conclusions presented in the first half of 2005 by the task force set up by the French department for Energy and Raw Materials (*Direction Générale de l'Énergie et des Matières Premières* – DGEMP, which has since become the French department for Energy and Climate – *Direction Générale de l'Énergie et du Climat* or DGEC) comprising members representing the relevant government departments (DGEMP, the State investment agency APE and the Budget Department), ANDRA and the producers of waste (EDF, AREVA, CEA). The approach applied by EDF to the working group's conclusions is reasonable and coherent with information available internationally.

In 2011 ANDRA and waste producers set up a partnership aiming to facilitate completion of the geological storage project by leveraging on all the skills of the French nuclear industry. This partnership encompasses joint studies on targeted issues and an interface between the ANDRA project team and nuclear operators to help them make well-informed, relevant contributions to governance of the project. ANDRA has drawn up specifications for early conceptional studies, taking into consideration many of the design options proposed by the waste producers, either as the benchmark or as variations. It should be able to propose an estimate of storage costs by the late 2013 at the earliest, after including the recommendations of the French Nuclear Safety Authority (*Autorité de Sûreté Nucléaire* or ASN), the National Evaluation Commission (*Commission Nationale d'Évaluation* or CNE) and the public debate. After consulting waste producers and the ASN, France's minister for Energy is due to decide on the value of these costs and make a public announcement.

Regarding the provision for long-life low-level waste, the search for a storage site has been suspended following withdrawal of two sites selected by ANDRA. ANDRA is due to submit a report to the French government with various proposals for management of this type of waste, and the conditions for resuming the search for a site. Despite significant delays and the financial risks involved, the calculation method for the provision for storage of long-life low-level waste remains unchanged and should cover most of the alternative scenarios that are currently being examined jointly by EDF and ANDRA.

### 29.1.3 Decommissioning provisions for nuclear power plants

These provisions concern the decommissioning of pressurised water reactor (PWR) nuclear power plants currently in operation, and nuclear power plants that have been permanently shut down.

They are estimated on the assumption that once decommissioning is complete, the sites will be returned to their original state and the land reused for industry.

- For nuclear power plants currently in operation (PWR plants with 900 MW, 1,300 MW and N4 reactors)

Provisions are estimated based on a 1991 study by the French Ministry of Trade and Industry, which set an estimated benchmark cost in €/MW, confirming the assumptions defined in 1979 by the PEON commission. This estimate was confirmed by a further study carried out by EDF in 1999 focusing on a specific site, and a subsequent valuation in 2009 involving the following steps:

- measurement of the decommissioning cost for a PWR plant with four 900 MW units, taking into consideration the most recent developments in regulations, past experience in decommissioning of shut-down plants and recommendations issued by the ASN;
- a review of the schedule for decommissioning operations over time;

- determination of the rules for extrapolation of costs for the entire fleet of PWR plants in operation.

International intercomparison studies carried out with a non-Group specialist firm support the results of this study.

The study resulted in a figure for decommissioning costs that confirms the amount of the provision booked to date, and validates the benchmark costs used, expressed in €/MW.

- For permanently shut-down nuclear power plants (UNGG power plants, Creys-Malville, Brennilis and Chooz A)

The provision is based on contractor quotes for decommissioning, newly updated in 2012. The costs and schedule have been revised to reflect industrial experience, contingencies and changes in regulations. This update has led to a €610 million increase in the provision for decommissioning of nuclear power plants, which is included in expenses for 2012 under "Other income and expenses".

The new valuation is based on the following key assumptions:

- that decommissioning will take place as soon as possible (this is unchanged from the previous quote);
- that long-life medium-level waste will be stored in a packaging and interim storage installation for radioactive waste (ICEDA) due to open in 2015 (rather than 2013 as previously estimated), until it can be placed in deep underground storage for which the assumptions are unchanged;
- that the facility for storing graphite waste will be available from 2025 (instead of 2019 as previously estimated);
- that the decree for full decommissioning of Brennilis will be obtained by the end of 2018.

### 29.1.4 Provision for last cores

This provision covers the future expenses resulting from scrapping fuel that will only be partially used when the reactor is shut down. It is measured based on:

- the cost of the loss on fuel in the reactor that is not totally spent at the time of final reactor shutdown and cannot be reused due to technical and regulatory constraints;
- the cost of fuel processing, disposal and waste storage operations. These costs are valued in a similar way to provisions for spent fuel management and long-term radioactive waste management.

These unavoidable costs are components of the cost of nuclear reactor shutdown and decommissioning. As such, they are fully covered by provision from the commissioning date and an asset associated with the provision is recognised.

### 29.1.5 Discounting of provisions related to nuclear generation and sensitivity analyses

#### 29.1.5.1 Discount rate

Since 31 December 2012, EDF has applied a nominal discount rate of 4.8% to calculate its provisions, together with assumed inflation of 1.9% (previously, the nominal discount rate applied was 5.0% with assumed inflation of 2.0%).

- Calculation of the discount rate

The discount rate is determined based on long-series data for a sample of bonds with maturities as close as possible to that of the liability. However, some expenses covered by these provisions will be disbursed over periods significantly longer than the duration of instruments generally traded on the financial markets.

The benchmark used to determine the discount rate is the sliding 10-year average of the return on French treasury bonds over the longest time horizons, plus the spread of corporate bonds rated A to AA, which include EDF.

The assumed inflation rate is determined in line with the forecasts provided by consensus and expected inflation based on the returns on inflation-linked bonds. In response to changes in these criteria, the Group adjusted its assumed inflation to 1.9% at 31 December 2012.

### ■ Revision of the discount rate and regulatory limit

The methodology used to determine the discount rate gives priority to long-term trends in rates, in keeping with the long-term horizon for disbursements. The discount rate is therefore revised in response to structural developments in the economy leading to medium and long-term changes.

The discount rate applied must also comply with the two limits laid down by the decree of 23 February 2007 and the decision of 21 March 2007. This means it must be lower than:

- a regulatory maximum "equal to the arithmetic average over the forty-eight most recent months of the constant 30-year rate (TEC 30 years), observed on the last date of the period concerned, plus one point";
- and the expected rate of return on assets covering the liability (dedicated assets).

In order to respect the regulatory limit, the discount rate was reduced to 4.8% at 31 December 2012.

### 29.1.5.2 Analyses of sensitivity to macro-economic assumptions

Sensitivity to assumptions concerning costs, inflation rate, long-term discount rate, and disbursement schedules can be estimated through comparison of the gross amount estimated under year-end economic conditions with the present value of the amount.

	31/12/2012		31/12/2011	
	Costs based on year-end economic conditions	Amounts in provisions at present value	Costs based on year-end economic conditions	Amounts in provisions at present value
<i>(in millions of Euros)</i>				
Spent fuel management	15,250	9,498	14,844	9,143
Long-term radioactive waste management	24,562	7,113	23,801	6,722
<b>BACK-END NUCLEAR CYCLE</b>	<b>39,812</b>	<b>16,611</b>	<b>38,645</b>	<b>15,865</b>
Decommissioning provisions for nuclear power plants	22,174	12,578	21,108	11,366
Provisions for last cores	3,887	2,193	3,888	2,012
<b>PROVISION FOR DECOMMISSIONING AND LAST CORES</b>	<b>26,061</b>	<b>14,771</b>	<b>24,996</b>	<b>13,378</b>

This approach can be complemented by estimating the impact of a change in the discount rate on the present value.

In application of article 11 of the decree of 23 February 2007, the following table reports these details for the main components of provisions for the back-end nuclear cycle, decommissioning of nuclear plants and last cores:

	Amounts in provisions at present value		Sensitivity to discount rate			
	2012	2011	2012		2011	
<i>(in millions of Euros)</i>			+0.20%	-0.20%	+0.25%	-0.25%
<b>Back-end nuclear cycle:</b>						
- spent fuel management	9,498	9,143	(165)	174	(200)	213
- long-term radioactive waste management	7,113	6,722	(361)	403	(412)	471
<b>Decommissioning and last cores:</b>						
- decommissioning of nuclear power plants	12,578	11,366	(458)	479	(544)	576
- last cores	2,193	2,012	(66)	70	(81)	87
<b>TOTAL</b>	<b>31,382</b>	<b>29,243</b>	<b>(1,050)</b>	<b>1,126</b>	<b>(1,237)</b>	<b>1,347</b>

## 29.2 EDF energy's nuclear provisions

The specific financing terms for long-term nuclear obligations related to EDF Energy are reflected as follows in the EDF group's financial statements:

- the obligations are reported in liabilities in the form of provisions amounting to €8,402 million at 31 December 2012;
- in the assets, EDF reports receivables corresponding to the amounts payable under the restructuring agreements by the NLF, for non-contracted obligations or decommissioning obligations, and by the British Government for contracted obligations (or historical liabilities).

These receivables are discounted at the same real rate as the obligations they are intended to finance. They are included in "Financial assets" in the consolidated balance sheet (see note 36.3) at the amount of €6,920 million at 31 December 2012 (€7,209 million at 31 December 2011).

### 29.2.1 Regulatory and contractual framework

Amendments signed with the Nuclear Liabilities Fund (NLF - an independent trust set up by the UK Government as part of the restructuring of British Energy) following the EDF group's acquisition of British Energy have a limited impact on the contractual financing commitments made to British Energy by the UK Secretary of State and the NLF under the "Restructuring Agreements". These agreements were entered into by British Energy on 14 January 2005 as part of the restructuring led by the UK Government from 2005 in order to stabilise British Energy's financial position. British Energy Generation Limited changed its name to EDF Energy Nuclear Generation Limited on 1 July 2011 and replaced British Energy in these agreements and amendments.

Under the terms of the Restructuring Agreements:

- the NLF agreed to fund, to the extent of its assets: (i) qualifying contingent and/or latent nuclear liabilities (including liabilities for management of spent fuel from the Sizewell B power station); and (ii) qualifying decommissioning costs for EDF Energy's existing nuclear power stations;
- the Secretary of State agreed to fund: (i) qualifying contingent and/or latent nuclear liabilities (including liabilities for the management of spent fuel from the Sizewell B power station) and qualifying decommissioning costs related to EDF Energy's existing nuclear power stations, to the extent that they exceed the assets of the NLF; and

(ii) Subject to a cap of £2,185 million (in December 2002 monetary values, adjusted accordingly), qualifying known existing liabilities for EDF Energy's spent fuel (including liabilities for management of spent fuel from plants other than Sizewell B loaded in reactors prior to 15 January 2005);

- EDF Energy is responsible for funding certain excluded or disqualified liabilities (e.g. those defined as EDF Energy liabilities), and additional liabilities which could be created as a result of failure by EDF Energy to meet minimum performance standards under applicable law. The obligations of EDF Energy to the NLF and the Secretary of State are guaranteed by the assets of the principal members of EDF Energy.

EDF Energy has also undertaken commitments to pay:

- annual decommissioning contributions for a period limited to the useful lives of the plants as at the date of the "Restructuring Agreements"; the corresponding provision amounts to €186 million at 31 December 2012;
- £150,000 (indexed to inflation) per tonne of uranium loaded in the Sizewell B reactor after the date of the "Restructuring Agreements".

Furthermore, EDF Energy has entered into a separate contract with the Nuclear Decommissioning Authority (NDA) for management of AGR spent fuel and associated radioactive waste resulting from operation of power plants other than Sizewell B after 15 January 2005, and bears no responsibility for this fuel and waste once it is transferred to the processing site at Sellafield. The corresponding costs of £150,000 (indexed to inflation) per tonne of loaded uranium - plus a rebate / surcharge dependent on market electricity price and electricity generated in the year - are included in inventories (see note 1.3.17.1).

### 29.2.2 Provisions for the back-end nuclear cycle

Spent fuel from the Sizewell B PWR (pressurized water reactor) plant is stored on site. Spent fuel from other plants is transferred to Sellafield for storage and reprocessing.

EDF Energy's provisions for the back-end nuclear cycle concern obligations for reprocessing and storage of spent fuel and long-term storage of radioactive waste, required by the existing regulations in the UK approved by the Nuclear Decommissioning Authority (NDA). Their amount is based on contractual agreements or if this is not possible, on the most recent technical estimates.

	31/12/2012		31/12/2011	
	Costs based on year-end economic conditions	Amounts in provisions at present value	Costs based on year-end economic conditions	Amounts in provisions at present value
(in millions of Euros)				
Spent fuel management	3,820	2,319	3,860	2,385
Long-term radioactive waste management	4,188	594	3,969	577
<b>BACK-END NUCLEAR CYCLE</b>	<b>8,008</b>	<b>2,913</b>	<b>7,829</b>	<b>2,962</b>



### 29.2.3 Decommissioning provisions

Provisions for decommissioning of nuclear plants result from management's best estimates. They cover the full cost of decommissioning and are measured on the basis of existing techniques and methods that are most likely to be used for application of current regulations. The current costs are based on Baseline Decommissioning Plans produced in 2008 and assume that plants will be decommissioned and the land will ultimately be reused.

	31/12/2012		31/12/2011	
	Costs based on year-end economic conditions	Amounts in provisions at present value	Costs based on year-end economic conditions	Amounts in provisions at present value
(in millions of Euros)				
<b>PLANT DECOMMISSIONING</b>	<b>12,887</b>	<b>3,994</b>	<b>12,213</b>	<b>4,239</b>

The table above only concerns decommissioning obligations excluding the present value of decommissioning contributions payable to the NLF (€186 million, see note 29.2.1).

## 29.3 CENG'S nuclear provisions

In the U.S., the obligations concerning spent fuel management, waste disposal and plant decommissioning are governed primarily by the U.S. Nuclear Regulatory Commission (NRC) and the U.S. Department of Energy (DOE). Additionally, certain waste transport obligations are governed by the U.S. Department of Transportation.

### 29.3.1 Provisions for back-end nuclear cycle

In accordance with current regulations, spent fuel is not reprocessed but instead is placed in temporary storage until the DOE takes charge of its final transportation and permanent storage in a national repository. For this service, CENG pays a quarterly fee to the DOE of approximately \$1/MWh of electricity generated.

### 29.3.2 Decommissioning provisions

CENG is obligated to decommission its three nuclear power plants (five nuclear generation units) when they cease operations, in accordance with NRC regulations and relevant state regulations for site restoration (greenfielding requirements). In the U.S., all decommissioning activities are required by the NRC to be completed within 60 years following cessation of plant operations.

Decommissioning provisions mainly comprise decontamination, dismantlement, disposal and site restoration activities. These activities encompass costs such as internal and external personnel expenses, materials and equipment, energy, insurance, property taxes, temporary on-site storage of spent nuclear fuel, transportation, and waste disposal.

Estimated decommissioning costs are calculated individually for each site based on technical studies that are regularly updated.

### 29.3.3 Funding of nuclear obligations

NRC-approved funding options provide for the establishment of external investment trust funds reserved for each unit, to cover its decommissioning obligations. These trust funds are currently invested in debt and equity instruments. They are treated as available-for-sale assets, and carried at fair value.

CENG's Investment Committee determines the general investment strategy, including the allocation of investments among asset types. CENG periodically undertakes a comprehensive asset-liability management study to adjust and optimise the asset allocation, given strategic objectives, liability duration, long-term capital market conditions, and the magnitude of such projected obligations. None of the funds are permitted to be invested directly in companies that own nuclear power plants.

The NRC sets minimum funding assurance guidelines to provide for radiological decommissioning activities and requires all plant owners to submit a report biennially in odd-numbered years that demonstrates adequate funding assurance for each unit. If a shortfall is observed, the NRC may require additional financial assurance measures in the form of cash, letters of credit or parent company guarantees. In March 2012, in connection with the merger between Exelon and Constellation Energy, CENG submitted an off-cycle assurance financial report. That report did not indicate any shortfall, and no additional funding assurance was required by the NRC. The next biennial report is required to be submitted by March 2013.

## 29.4 Other subsidiaries' nuclear provisions

Other subsidiaries' provisions for the back-end of the nuclear cycle and decommissioning mostly concern nuclear plants in Belgium.

## ➤ Note 30 Provisions for decommissioning of non-nuclear facilities

The breakdown by company is as follows:

<i>(in millions of Euros)</i>	EDF	EDF Energy	Edison	Other entities	Total
<b>PROVISIONS FOR DECOMMISSIONING OF NON-NUCLEAR FACILITIES AT 31/12/2012</b>	<b>522</b>	<b>71</b>	<b>416</b>	<b>126</b>	<b>1,135</b>
Provisions for decommissioning of non-nuclear facilities at 31/12/2011	477	50	189	134	850

Provisions for decommissioning of non-nuclear facilities principally concern fossil-fired power plants.

The costs of decommissioning fossil-fired power plants are calculated using regularly updated studies based on estimated future costs, measured by reference to the charges recorded on past operations and the most recent estimates for plants still in operation.

The provision recorded at 31 December 2012 reflects the most recent known contractor quotes and commissioning of new generation assets.

## ➤ Note 31 Provisions for employee benefits

### 31.1 EDF GROUP

<i>(in millions of Euros)</i>	<b>31/12/2012</b>	31/12/2011
Provisions for employee benefits – current portion	912	940
Provisions for employee benefits – non-current portion	19,540	14,611
<b>PROVISIONS FOR EMPLOYEE BENEFITS</b>	<b>20,452</b>	<b>15,551</b>

#### 31.1.1 Breakdown of the change in the provisions

<i>(in millions of Euros)</i>	Obligations	Fund assets	Obligations net of fund assets	Unrecognised past service cost	Provision in the balance sheet
<b>Balances at 31/12/2011</b>	<b>28,267</b>	<b>(12,594)</b>	<b>15,673</b>	<b>(122)</b>	<b>15,551</b>
Net expense for 2012	2,353	(635)	1,718	13	1,731
Change in actuarial gains and losses	5,476	(866)	4,610	-	4,610
Employer's contributions to funds	-	(706)	(706)	-	(706)
Employees' contributions to funds	24	(24)	-	-	-
Benefits paid	(1,353)	555	(798)	-	(798)
Unvested past service cost	74	-	74	(74)	-
Translation adjustment	142	(111)	31	-	31
Changes in scope of consolidation	36	-	36	-	36
Other movements	23	(27)	(4)	1	(3)
<b>BALANCES AT 31/12/2012</b>	<b>35,042</b>	<b>(14,408)</b>	<b>20,634</b>	<b>(182)</b>	<b>20,452</b>

## 31.1.2 Post-employment and long-term employee benefit expenses

<i>(in millions of Euros)</i>	<b>31/12/2012</b>	31/12/2011
Current service cost	(743)	(686)
Interest expense (discount effect )	(1,392)	(1,337)
Expected return on fund assets	635	597
Past service cost	36	(25)
Change in actuarial gains and losses – long-term benefits	(271)	(100)
Effect of plan curtailment or settlement	4	(2)
<b>POST-EMPLOYMENT AND OTHER LONG-TERM EMPLOYEE BENEFIT EXPENSES</b>	<b>(1,731)</b>	<b>(1,553)</b>
including:		
Operating expense	(974)	(813)
Financial expense	(757)	(740)

## 31.1.3 Provisions for employee benefits by operating segment

<i>(in millions of Euros)</i>	France	United Kingdom	Italy	Other international	Other activities	Total
<b>Obligations at 31/12/2011</b>	<b>21,454</b>	<b>6,027</b>	<b>37</b>	<b>462</b>	<b>287</b>	<b>28,267</b>
Net expense for 2012	1,789	500	5	44	15	2,353
Change in actuarial gains and losses	5,685	(333)	-	42	82	5,476
Employees' contributions to funds	-	23	-	-	1	24
Benefits paid	(1,123)	(196)	(2)	(25)	(7)	(1,353)
Unvested past service cost	74	-	-	-	-	74
Translation adjustment	-	142	-	(2)	2	142
Changes in scope of consolidation	-	-	19	6	11	36
Other movements	-	3	(9)	2	27	23
<b>OBLIGATIONS AT 31/12/2012</b>	<b>27,879</b>	<b>6,166</b>	<b>50</b>	<b>529</b>	<b>418</b>	<b>35,042</b>
Fair value of fund assets	(8,280)	(5,755)	-	(207)	(166)	(14,408)
Unrecognised past service cost	(178)	-	-	(3)	(1)	(182)
<b>PROVISIONS FOR EMPLOYEE BENEFITS AT 31/12/2012</b>	<b>19,421</b>	<b>411</b>	<b>50</b>	<b>319</b>	<b>251</b>	<b>20,452</b>

<i>(in millions of Euros)</i>	France	United Kingdom	Italy	Other international	Other activities	Total
<b>Obligations at 31/12/2011</b>	<b>21,454</b>	<b>6,027</b>	<b>37</b>	<b>462</b>	<b>287</b>	<b>28,267</b>
Fair value of fund assets	(7,306)	(4,978)	-	(181)	(129)	(12,594)
Unrecognised past service cost	(117)	-	-	(3)	(2)	(122)
<b>PROVISIONS FOR EMPLOYEE BENEFITS AT 31/12/2011</b>	<b>14,031</b>	<b>1,049</b>	<b>37</b>	<b>278</b>	<b>156</b>	<b>15,551</b>

## 31.2 France

The "France" segment mainly comprises EDF SA and ERDF. Almost all of the employees of these companies benefit from IEG status including the special pension system and other IEG benefits, described in note 1.3.22.

### 31.2.1 Details of changes in the provision

	Obligations	Fund assets	Obligations net of fund assets	Unrecognised past service cost	Provision in the balance sheet
<i>(in millions of Euros)</i>					
<b>Balances at 31/12/2011</b>	<b>21,454</b>	<b>(7,306)</b>	<b>14,148</b>	<b>(117)</b>	<b>14,031</b>
Net expense for 2012	1,789	(353)	1,436	13	1,449
Change in actuarial gains and losses	5,685	(617)	5,068	-	5,068
Employer's contributions to funds	-	(345)	(345)	-	(345)
Employees' contributions to funds	-	-	-	-	-
Benefits paid	(1,123)	341	(782)	-	(782)
Unvested past service cost	74	-	74	(74)	-
Other movements	-	-	-	-	-
<b>BALANCES AT 31/12/2012</b>	<b>27,879</b>	<b>(8,280)</b>	<b>19,599</b>	<b>(178)</b>	<b>19,421</b>

The change in actuarial gains and losses mainly relates to the lower discount rate for long-term obligations to employees, which was reduced to 3.5% at 31 December 2012 (5.0% at 31 December 2011).

### 31.2.2 Post-employment and long-term employee benefit expenses

	31/12/2012	31/12/2011
<i>(in millions of Euros)</i>		
Current service cost	(507)	(501)
Interest expense (discount effect)	(1,070)	(1,030)
Expected return on fund assets	353	330
Past service cost	40	(13)
Change in actuarial gains and losses – long-term benefits	(266)	(98)
Effect of plan curtailment or settlement	1	-
<b>POST-EMPLOYMENT AND OTHER LONG-TERM EMPLOYEE BENEFIT EXPENSES</b>	<b>(1,449)</b>	<b>(1,312)</b>
including:		
Operating expense	(732)	(612)
Financial expense	(717)	(700)

## 31.2.3 Provisions for employee benefits by nature

At 31 December 2012:

	Obligations	Fund assets	Unrecognised past service cost	Provision in the balance sheet
<i>(in millions of Euros)</i>				
<b>Provisions for post-employment benefits at 31/12/2012</b>	<b>26,591</b>	<b>(8,280)</b>	<b>(178)</b>	<b>18,133</b>
<b>Comprising:</b>				
Pensions	20,859	(7,668)	-	13,191
Benefits in kind (electricity/gas)	3,923	-	-	3,923
Retirement gratuities	861	(598)	(102)	161
Other	948	(14)	(76)	858
<b>Provisions for long-term employee benefits at 31/12/2012</b>	<b>1,288</b>	<b>-</b>	<b>-</b>	<b>1,288</b>
<b>Comprising:</b>				
Annuities following work-related accident and illness, and invalidity	1,096	-	-	1,096
Long service awards	155	-	-	155
Other	37	-	-	37
<b>PROVISIONS FOR EMPLOYEE BENEFITS AT 31/12/2012</b>	<b>27,879</b>	<b>(8,280)</b>	<b>(178)</b>	<b>19,421</b>

At 31 December 2011:

	Obligations	Fund assets	Unrecognised past service cost	Provision in the balance sheet
<i>(in millions of Euros)</i>				
<b>Provisions for post-employment benefits at 31/12/2011</b>	<b>20,362</b>	<b>(7,306)</b>	<b>(117)</b>	<b>12,939</b>
<b>Comprising:</b>				
Pensions	16,138	(6,762)	-	9,376
Benefits in kind (electricity/gas)	2,912	-	-	2,912
Retirement gratuities	744	(531)	(114)	99
Other	568	(13)	(3)	552
<b>Provisions for long-term employee benefits at 31/12/2011</b>	<b>1,092</b>	<b>-</b>	<b>-</b>	<b>1,092</b>
<b>Comprising:</b>				
Annuities following work-related accident and illness, and invalidity	917	-	-	917
Long service awards	141	-	-	141
Other	34	-	-	34
<b>PROVISIONS FOR EMPLOYEE BENEFITS AT 31/12/2011</b>	<b>21,454</b>	<b>(7,306)</b>	<b>(117)</b>	<b>14,031</b>



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## 31.2.4 Fund assets

For France, these assets amount to €8,280 million at 31 December 2012 (€7,306 million at 31 December 2011) and concern retirement gratuities (with target coverage of 100%) and the specific benefits of the special pension system. They consist of insurance contracts.

Investments under these contracts break down as follows:

<i>(in millions of Euros)</i>	31/12/2012	31/12/2011
<b>FUND ASSETS</b>	<b>8,280</b>	<b>7,306</b>
<i>Assets funding special pension benefits</i>	<i>7,668</i>	<i>6,762</i>
(%)		
Equities	29%	26%
Bonds and monetary instruments	71%	74%
<i>Assets funding retirement gratuities</i>	<i>598</i>	<i>531</i>
(%)		
Equities	31%	39%
Bonds and monetary instruments	69%	61%
<i>Other fund assets</i>	<i>14</i>	<i>13</i>

## 31.2.5 Actuarial assumptions

<i>(in %)</i>	31/12/2012	31/12/2011
Discount rate	3.50%	5.00%
Expected return on fund assets	3.80%	4.70%
Wage increase rate	2.00%	2.00%

In France, the discount rate for long-term obligations to employees is determined based on the return on a government bond of comparable duration – the 2035 French Treasury bond, which has a duration of 14 years consistent with the duration of employee benefit obligations – plus a spread calculated on the leading non financial companies, also over a comparable duration.

In view of changes in the economic and market parameters used, the Group revised the discount rate to 3.50% for 2012.

## 31.2.6 Sensitivity analysis

<i>(in %)</i>	31/12/2012	31/12/2011
Impact of a 25bp increase or decrease in the discount rate:		
■ On the amount of the obligation	-4.0%/ +4.3%	-3.4%/ +3.6%
■ On the service cost for Y+1	-6.4%/ +7.1%	-5.3%/ +5.7%

## 31.3 United Kingdom

EDF Energy sponsors three defined benefit pension schemes:

- the EDF Energy Pension Scheme ("EEPS") which was established in March 2004 and includes a number of legacy pension schemes from London Electricity and Seaboard. Membership of EEPS is open to all employees;
- the British Energy Generation Group ("BEGG") of the Electricity Supply Pension Scheme ("ESPS"), of which the majority of members are employees in Nuclear Generation. BEGG was closed to new members in August 2012; and
- the EDF Energy Generation and Supply Group ("EEGS") of the ESPS which was established in December 2010 for the employees remaining with EDF Energy following the transfer of the former Group to UK Power Networks as part of the sale of Networks. EEGS is closed to new members.

Each pension scheme is financially independent from the others. With the exception of EEPS all of the above schemes are part of the industry wide ESPS.

## 31.3.1 Details of the change in the provision

	Obligations	Fund assets	Obligations net of fund assets	Unrecognised past service cost	Provision in the balance sheet
<i>(in millions of Euros)</i>					
<b>Balances at 31/12/2011</b>	<b>6,027</b>	<b>(4,978)</b>	<b>1,049</b>	<b>-</b>	<b>1,049</b>
Net expense for 2012	500	(261)	239	-	239
Change in actuarial gains and losses	(333)	(238)	(571)	-	(571)
Employer's contributions to funds	-	(337)	(337)	-	(337)
Employees' contributions to funds	23	(23)	-	-	-
Benefits paid	(196)	196	-	-	-
Unvested past service cost	-	-	-	-	-
Translation adjustment	142	(114)	28	-	28
Changes in scope of consolidation	-	-	-	-	-
Other movements	3	-	3	-	3
<b>BALANCES AT 31/12/2012</b>	<b>6,166</b>	<b>(5,755)</b>	<b>411</b>	<b>-</b>	<b>411</b>

## 31.3.2 Post-employment and long-term employee benefit expenses

	31/12/2012	31/12/2011
<i>(in millions of Euros)</i>		
Current service cost	(209)	(160)
Interest expense (discount effect)	(289)	(281)
Expected return on fund assets	261	255
Effect of plan curtailment or settlement	(2)	(3)
<b>POST-EMPLOYMENT AND OTHER LONG-TERM EMPLOYEE BENEFIT EXPENSES</b>	<b>(239)</b>	<b>(189)</b>
including:		
Operating expense	(211)	(163)
Financial expense	(28)	(26)

## 31.3.3 Fund assets

Pension obligations in the United Kingdom are partly covered by external funds with a present value of €5,755 million at 31 December 2012 (€4,978 million at 31 December 2011). These funds break down as follows:

	31/12/2012	31/12/2011
<i>(in millions of Euros)</i>		
<b>FUND ASSETS</b>	<b>5,755</b>	<b>4,978</b>
Comprising (%):		
Real estate assets	7%	6%
Equities	33%	34%
Bonds and monetary instruments	49%	52%
Other	11%	8%

## 31.3.4 Actuarial assumptions

(in %)	31/12/2012	31/12/2011
Discount rate	4.50%	4.70%
Expected return on fund assets	4.70%	5.10%
Wage increase rate	3.10%	4.70%

## 31.3.5 Sensitivity analyses

(in %)	31/12/2012	31/12/2011
Impact of a 25bp increase or decrease in the discount rate:		
■ On the amount of the obligations	-4.7%/ +4.9%	-4.8%/ +5.0%
■ On the past service cost for Y+1	-6.0%/ +6.6%	-7.3%/ +7.3%

## ➤ Note 32 Other provisions

Details of changes in other provisions are as follows:

	31/12/2011	Increases	Decreases		Changes in scope	Other changes	31/12/2012
(in millions of Euros)			Utilisations	Reversals			
Provisions for contingencies related to investments	194	70	(54)	(18)	-	-	192
Provisions for tax liabilities	266	38	(3)	(38)	148	3	414
Provisions for litigation <sup>(1)</sup>	563	98	(42)	(75)	71	(11)	604
Provisions for onerous contracts	808	104	(204)	-	-	(5)	703
Provisions related to environmental schemes <sup>(2)</sup>	466	703	(612)	-	16	8	581
Other provisions	647	545	(288)	(74)	170	(3)	997
<b>TOTAL</b>	<b>2,944</b>	<b>1,558</b>	<b>(1,203)</b>	<b>(205)</b>	<b>405</b>	<b>(8)</b>	<b>3,491</b>

(1) Provisions for litigation include a provision relating to a dispute with social security bodies.

(2) Provisions related to environmental schemes include provisions for greenhouse gas emission rights and renewable energy certificates (see note 50).

Provisions for onerous contracts include the fair value of:

- British Energy sales contracts, amounting to €27 million at 31 December 2012 (€130 million at 31 December 2011);
- CENG long-term sales contracts (2011-2012), amounting to €461 million at 31 December 2012 (€491 million at 31 December 2011). Reversals from provisions relating to these contracts result from the difference over the year between contractualised income and income valued on the basis of market prices at the acquisition date.

## ➤ Note 33 Special French public electricity distribution concession liabilities

The changes in special concession liabilities for existing assets and assets to be replaced are as follows:

<i>(in millions of Euros)</i>	31/12/2012	31/12/2011
Value in kind of assets	41,702	40,307
Unamortised financing by the operator	(20,182)	(19,383)
<b>Rights in existing assets – net value</b>	<b>21,520</b>	<b>20,924</b>
Amortisation of financing by the grantor	10,453	9,923
Provisions for renewal	10,578	10,922
<b>Rights in assets to be replaced</b>	<b>21,031</b>	<b>20,845</b>
<b>SPECIAL FRENCH PUBLIC ELECTRICITY DISTRIBUTION CONCESSION LIABILITIES</b>	<b>42,551</b>	<b>41,769</b>

## ➤ Note 34 Trade payables

<i>(in millions of Euros)</i>	31/12/2012	31/12/2011
Trade payables – excluding EDF Trading	11,027	9,358
Trade payables – EDF Trading	3,616	4,323
<b>TRADE PAYABLES</b>	<b>14,643</b>	<b>13,681</b>

## ➤ Note 35 Other liabilities

Details of other liabilities are as follows:

<i>(in millions of Euros)</i>	31/12/2012	31/12/2011
Advances and progress payments received	6,491	6,696
Liabilities related to property, plant and equipment	2,699	2,404
Tax liabilities	4,922	4,213
Social charges	3,166	2,889
Deferred income related to long-term contracts	4,004	4,825
Other deferred income	996	1,110
Other	2,977	2,752
<b>OTHER LIABILITIES</b>	<b>25,255</b>	<b>24,889</b>
Non-current portion	4,218	4,989
Current portion	21,037	19,900

## 35.1 Advances and progress payments received

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At 31 December 2012 advances and progress payments received include monthly standing order payments by EDF's residential and business customers amounting to €5,558 million (€5,145 million at 31 December 2011). The increase over 2012 is mainly explained by the growing number of customers that opt to pay their bills this way.

## 35.2 Tax liabilities

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At 31 December 2012 tax liabilities mainly include an amount of €747 million for the CSPE income to be collected by EDF on energy supplied but not yet billed (€579 million at 31 December 2011).

## 35.3 Deferred income related to long-term contracts

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EDF's deferred income related to long-term contracts at 31 December 2012 comprises €2,183 million (€2,818 million at 31 December 2011) of partner advances made under the nuclear plant financing plans.

The change over the year includes the reimbursement by the EDF group in December 2012 of the advance paid by ENEL (€613 million) following termination of the two Groups' industrial partnership for the Flamanville EPR (see note 3.3.2). This advance was recorded at the value of €513 million at 31 December 2011.

Deferred income on long-term contracts also include an advance paid to EDF in 2010 under the agreement with the Exeltium consortium.



## FINANCIAL ASSETS AND LIABILITIES

### ➤ Note 36 Current and non-current financial assets

#### 36.1 Breakdown between current and non-current financial assets

Current and non-current financial assets break down as follows:

	31/12/2012			31/12/2011		
	Current	Non-current	Total	Current	Non-current	Total
<i>(in millions of Euros)</i>						
Financial assets carried at fair value with changes in fair value included in income	3,167	12	3,179	4,482	12	4,494
Available-for-sale financial assets	11,208	16,045	27,253	10,413	13,915	24,328
Held-to-maturity investments	9	14	23	3	16	19
Positive fair value of hedging derivatives	825	1,596	2,421	914	1,862	2,776
Loans and financial receivables	1,224	12,804	14,028	1,168	8,455	9,623
<b>CURRENT AND NON-CURRENT FINANCIAL ASSETS <sup>(1)</sup></b>	<b>16,433</b>	<b>30,471</b>	<b>46,904</b>	<b>16,980</b>	<b>24,260</b>	<b>41,240</b>

<sup>(1)</sup> Including impairment of €(1,111) million at 31 December 2012 (€(1,141) million) at 31 December 2011).

#### 36.2 Details of financial assets

##### 36.2.1 Financial assets carried at fair value with changes in fair value included in income

<i>(in millions of Euros)</i>	31/12/2012	31/12/2011
Derivatives - positive fair value	3,162	4,478
Fair value of derivatives held for trading	5	4
Financial assets carried at fair value under IAS 39 option	12	12
<b>FINANCIAL ASSETS CARRIED AT FAIR VALUE WITH CHANGES IN FAIR VALUE INCLUDED IN INCOME</b>	<b>3,179</b>	<b>4,494</b>

Financial assets carried at fair value with changes in fair value included in income mainly concern EDF Trading.

##### 36.2.2 Available-for-sale financial assets

	31/12/2012			31/12/2011		
	Equities <sup>(1)</sup>	Debt securities	Total	Equities <sup>(1)</sup>	Debt securities	Total
<i>(in millions of Euros)</i>						
EDF dedicated assets	7,328	7,890	15,218	5,801	7,510	13,311
Liquid assets	3,715	6,574	10,289	2,782	6,242	9,024
Other securities	1,676	70	1,746	1,918	75	1,993
<b>AVAILABLE-FOR-SALE FINANCIAL ASSETS</b>	<b>12,719</b>	<b>14,534</b>	<b>27,253</b>	<b>10,501</b>	<b>13,827</b>	<b>24,328</b>

<sup>(1)</sup> Equities or investment funds.

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Changes in the fair value of available-for-sale financial assets were recorded in equity (EDF share) over the period as follows:

	2012		2011	
	Gross changes in fair value recorded in equity <sup>(1)</sup>	Gross changes in fair value transferred to income <sup>(2)</sup>	Gross changes in fair value recorded in equity <sup>(1)</sup>	Gross changes in fair value transferred to income <sup>(2)</sup>
<i>(in millions of Euros)</i>				
EDF dedicated assets	1,237	236	(448)	(77)
Liquid assets	48	28	27	35
Other securities	(76)	8	(319)	(38)
<b>AVAILABLE-FOR-SALE FINANCIAL ASSETS</b>	<b>1,209</b>	<b>272</b>	<b>(740)</b>	<b>(80)</b>

(1) + / ( ) : increase / (decrease) in equity (EDF's share).

(2) + / ( ) : increase / (decrease) in income (EDF's share).

Gross changes in fair value included in equity in 2012 (EDF's share) principally concern EDF (€1,247 million, including €1,237 million for dedicated assets).

No significant impairment was recorded in 2012.

Gross changes in fair value over 2011 mainly concern EDF (€843) million), including:

- €(448) million for dedicated assets;
- €(272) million for Veolia Environnement shares and €(149) million for AREVA shares included in "Other securities".

In 2011 the fair value of the Veolia Environnement shares, based on the year-end stock market price, fell to below 50% of their historical value, and impairment of €(340) million was recorded in the financial result.

## 36.2.2.1 Liquid assets

Liquid assets are financial assets consisting of funds or interest rate instruments with initial maturity of over three months that are readily convertible into cash, and are managed according to a liquidity-oriented policy.

EDF's monetary investment funds, included in liquid assets, amount to €3,249 million at 31 December 2012 (€2,187 million at 31 December 2011).

## 36.2.2.2 Other securities

At 31 December 2012, other securities mainly include:

- At CENG, €607 million of available-for-sale financial assets related to decommissioning trust funds (reserved for financing of nuclear plant decommissioning);
- At EDF, shares in Areva (€110 million) and Veolia Environnement (€202 million).

In 2012, the Group sold all its shares in Exelon for the sum of €361 million. A gain on sale of €32 million was booked in the financial result for 2012, resulting partly from conversion of CEG shares to Exelon shares as part of finalisation of the merger between the two companies on 12 March 2012, and partly from the sale of Exelon shares during the year.

## 36.3 Fair value of financial assets recorded at amortised cost

	31/12/2012		31/12/2011	
	Fair value	Net book value	Fair value	Net book value
<i>(in millions of Euros)</i>				
Held-to-maturity investments	23	23	19	19
Loans and financial receivables – amounts receivable from the NLF	6,920	6,920	7,209	7,209
Loans and financial receivables – CSPE	4,879	4,879	-	-
Loans and financial receivables – other	2,368	2,229	2,567	2,414
<b>FINANCIAL ASSETS RECORDED AT AMORTISED COST</b>	<b>14,190</b>	<b>14,051</b>	<b>9,795</b>	<b>9,642</b>

Loans and financial receivables include amounts representing reimbursements receivable from the NLF and the British government for coverage of long-term nuclear obligations, totalling €6,920 million at 31 December 2012 (€7,209 million at 31 December 2011), discounted at the same rate as the provisions they finance.

Following the agreement reached with the French authorities, the receivable corresponding to the CSPE shortfall at 31 December 2012

has been transferred from "other receivables" to "loans and financial receivables" (€4,250 million, see note 4.1). The €629 million financial income corresponding to the costs borne by the Group for the CSPE system is also recorded under the same heading.

Other loans and financial receivables include EDF's loans to RTE, amounting to €1,174 million at 31 December 2012 (€1,400 million at 31 December 2011).

## 36.4 Change in financial assets other than derivatives

The variation in financial assets is as follows:

### 36.4.1 At 31 December 2012

<i>(in millions of Euros)</i>	31/12/2011	Net Increases	Changes in fair value	Changes in scope	Other	31/12/2012
Available-for-sale financial assets	24,328	1,887	937	114	(13)	27,253
Held-to-maturity investments	19	10	-	(6)	-	23
Loans and financial receivables	9,623	330	-	60	4,015	14,028

Other changes in loans and financial receivables reflect the transfer of the receivable corresponding to the CSPE shortfall (€4,250 million), and the change in the receivable representing reimbursements due from the NLF and the British government for coverage of long-term nuclear obligations, totalling €(289) million.

### 36.4.2 At 31 December 2011

<i>(in millions of Euros)</i>	31/12/2010	Net Increases	Changes in fair value	Changes in scope	Other	31/12/2011
Available-for-sale financial assets	25,035	(320)	(517)	75	55	24,328
Held-to-maturity investments	25	(3)	-	-	(3)	19
Loans and financial receivables	9,348	(380)	-	49	606	9,623

Other changes in loans and financial receivables reflect the change in the receivable representing reimbursements due from the NLF and the British government for coverage of long-term nuclear obligations, totalling €596 million.

## ➤ Note 37 Cash and cash equivalents

Cash and cash equivalents comprise cash in hand and at bank and investments in money market instruments. Cash and cash equivalents as stated in the cash flow statements include the following amounts recorded in the balance sheet:

<i>(in millions of Euros)</i>	31/12/2012	31/12/2011
Cash	3,090	2,018
Cash equivalents <sup>(1)</sup>	2,584	3,502
Financial current accounts	200	223
<b>CASH AND CASH EQUIVALENTS</b>	<b>5,874</b>	<b>5,743</b>

(1) Items stated at fair value amount to €2,507 million at 31 December 2012.

## ➤ Note 38 Current and non-current financial liabilities

### 38.1 Breakdown between current and non-current financial liabilities

Current and non-current financial liabilities break down as follows:

	31/12/2012			31/12/2011		
	Non-current	Current	Total	Non-current	Current	Total
<i>(in millions of Euros)</i>						
Loans and other financial liabilities	45,891	14,041	<b>59,932</b>	41,989	8,045	<b>50,034</b>
Negative fair value of derivatives held for trading	-	2,290	<b>2,290</b>	-	3,433	<b>3,433</b>
Negative fair value of hedging derivatives	1,089	1,190	<b>2,279</b>	699	1,311	<b>2,010</b>
<b>FINANCIAL LIABILITIES</b>	<b>46,980</b>	<b>17,521</b>	<b>64,501</b>	<b>42,688</b>	<b>12,789</b>	<b>55,477</b>

### 38.2 Loans and other financial liabilities

#### 38.2.1 Changes in loans and other financial liabilities

	Bonds	Loans from financial institutions	Other financial liabilities	Loans related to finance-leased assets	Accrued Interest	Total
<i>(in millions of Euros)</i>						
<b>Balances at 31/12/2010</b>	<b>35,499</b>	<b>5,404</b>	<b>5,486</b>	<b>373</b>	<b>1,015</b>	<b>47,777</b>
Increases	1,810	3,275	663	-	81	5,829
Decreases	(1,023)	(3,228)	(302)	(16)	(7)	(4,576)
Translation adjustments	366	34	145	-	1	546
Changes in scope of consolidation	(11)	(29)	(334)	(4)	-	(378)
Other changes	883	25	(91)	18	1	836
<b>Balances at 31/12/2011</b>	<b>37,524</b>	<b>5,481</b>	<b>5,567</b>	<b>371</b>	<b>1,091</b>	<b>50,034</b>
Increases	6,000	1,984	4,400	-	256	12,640
Decreases	(802)	(3,944)	(382)	(17)	(18)	(5,163)
Translation adjustments	126	(5)	(19)	-	-	102
Changes in scope of consolidation	894	1,444	(25)	43	(5)	2 351
Other changes	127	(52)	(153)	30	16	(32)
<b>BALANCES AT 31/12/2012</b>	<b>43,869</b>	<b>4,908</b>	<b>9,388</b>	<b>427</b>	<b>1,340</b>	<b>59,932</b>

Other changes in loans and other financial liabilities reflect changes in fair value amounting to €86 million at 31 December 2012 (€826 million at 31 December 2011).

EDF received funds from the following bond issues:

- €2 billion from a 10-year bond with annual coupon of 3.875%, on 18 January 2012;
- €1 billion from a 15-year bond with annual coupon of 4.125%, and £500 million from a 25-year bond with annual coupon of 5.5%, on 27 March 2012;
- €2 billion from a 10.5-year bond with annual coupon of 2.75%, on 10 September 2012.

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Loans and other financial liabilities of the Group's main entities are as follows:

<i>(in millions of Euros)</i>	31/12/2012	31/12/2011
EDF and other affiliated subsidiaries <sup>(1)</sup>	42,384	35,407
EDF Energy <sup>(2)</sup>	6,786	5,965
EDF Énergies Nouvelles	3,700	4,572
Edison <sup>(3)</sup>	3,474	1,861
Other	3,588	2,229
<b>LOANS AND OTHER FINANCIAL LIABILITIES</b>	<b>59,932</b>	<b>50,034</b>

(1) ERDF, PEI, EDF International, EDF Investissements Groupe.

(2) Including holding companies.

(3) Edison excluding TdE.

At 31 December 2012, none of these entities was in default on any borrowing.

The Group's principal borrowings at 31 December 2012 are as follows:

Type of borrowing <i>(in millions of currencies)</i>	Entity	Issue <sup>(1)</sup>	Maturity	Issue amount	Currency	Rate
Euro MTN	EDF	11/2008	01/2013	2,000	EUR	5.60%
Bond	EDF	12/2008	12/2013	1,350	CHF	3.38%
Bond	EDF	01/2009	01/2014	1,250	USD	5.50%
Euro MTN	EDF	07/2009	07/2014	3,269	EUR	4.50%
Euro MTN	EDF	01/2009	01/2015	2,000	EUR	5.10%
Euro MTN	EDF	10/2001	10/2016	1,100	EUR	5.50%
Euro MTN	EDF	02/2008	02/2018	1,500	EUR	5.00%
Bond	EDF	01/2009	01/2019	2,000	USD	6.50%
Bond	EDF	01/2010	01/2020	1,400	USD	4.60%
Euro MTN	EDF	05/2008	05/2020	1,200	EUR	5.40%
Euro MTN	EDF	01/2009	01/2021	2,000	EUR	6.30%
Euro MTN	EDF	01/2012	01/2022	2,000	EUR	3.88%
Euro MTN	EDF	09/2012	03/2023	2,000	EUR	2.75%
Euro MTN	EDF	09/2009	09/2024	2,500	EUR	4.60%
Euro MTN	EDF	11/2010	11/2025	750	EUR	4.00%
Euro MTN	EDF	03/2012	03/2027	1,000	EUR	4.13%
Euro MTN	EDF	04/2010	04/2030	1,500	EUR	4.60%
Euro MTN	EDF	07/2001	07/2031	650	GBP	5.88%
Euro MTN	EDF	02/2003	02/2033	850	EUR	5.60%
Euro MTN	EDF	06/2009	06/2034	1,500	GBP	6.10%
Bond	EDF	01/2009	01/2039	1,750	USD	7.00%
Euro MTN	EDF	11/2010	11/2040	750	EUR	4.50%
Euro MTN	EDF	10/2011	10/2041	1,250	GBP	5.50%
Euro MTN	EDF	09/2010	09/2050	1,000	GBP	5.10%

(1) Date funds were received.



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## 38.2.2 Maturity of loans and other financial liabilities

At 31 December 2012:

	Bonds	Loans from financial institutions	Other financial liabilities	Loans related to finance-leased assets	Accrued interest	Total
<i>(in millions of Euros)</i>						
Less than one year	3,848	1,940	6,998	37	1,218	<b>14,041</b>
From one to five years	10,590	791	1,627	126	61	<b>13,195</b>
More than five years	29,431	2,177	763	264	61	<b>32,696</b>
<b>LOANS AND OTHER FINANCIAL LIABILITIES AT 31 DECEMBER 2012</b>	<b>43,869</b>	<b>4,908</b>	<b>9,388</b>	<b>427</b>	<b>1,340</b>	<b>59,932</b>

At 31 December 2011:

	Bonds	Loans from financial institutions	Other financial liabilities	Loans related to finance-leased assets	Accrued interest	Total
<i>(in millions of Euros)</i>						
Less than one year	790	1,207	4,920	37	1,091	<b>8,045</b>
From one to five years	12,760	1,964	520	101	-	<b>15,345</b>
More than five years	23,974	2,310	127	233	-	<b>26,644</b>
<b>LOANS AND OTHER FINANCIAL LIABILITIES AT 31 DECEMBER 2011</b>	<b>37,524</b>	<b>5,481</b>	<b>5,567</b>	<b>371</b>	<b>1,091</b>	<b>50,034</b>

## 38.2.3 Breakdown of loans and other financial liabilities by currency

	31/12/2012			31/12/2011		
	Initial debt structure	Impact of hedging instruments <sup>(1)</sup>	Debt structure after hedging	Initial debt structure	Impact of hedging instruments <sup>(1)</sup>	Debt structure after hedging
<i>(in millions of Euros)</i>						
Euro (EUR)	35,709	1,485	37,194	29,479	(3,129)	26,350
American dollar (USD)	11,621	(6,240)	5,381	8,890	(2,401)	6,489
Pound sterling (GBP)	7,927	5,773	13,700	6,822	7,559	14,381
Other	4,675	(1,018)	3,657	4,843	(2,029)	2,814
<b>LOANS AND OTHER FINANCIAL LIABILITIES</b>	<b>59,932</b>	<b>-</b>	<b>59,932</b>	<b>50,034</b>	<b>-</b>	<b>50,034</b>

(1) Hedges of liabilities and net assets of foreign subsidiaries.

## 38.2.4 Breakdown of loans by type of interest rate, before and after swaps

	31/12/2012			31/12/2011		
	Initial debt structure	Impact of derivatives	Final debt structure	Initial debt structure	Impact of derivatives	Final debt structure
<i>(in millions of Euros)</i>						
Fixed rates	52,306	(4,844)	47,462	42,614	(2,630)	39,984
Floating rates	7,626	4,844	12,470	7,420	2,630	10,050
<b>LOANS AND OTHER FINANCIAL LIABILITIES</b>	<b>59,932</b>	<b>-</b>	<b>59,932</b>	<b>50,034</b>	<b>-</b>	<b>50,034</b>

The breakdown of loans and financial liabilities by interest rate includes the impact of all derivatives classified as hedges in accordance with IAS 39.

## 38.2.5 CREDIT LINES

At 31 December 2012, the Group has unused credit lines with various banks totalling €8,598 million (€10,179 million at 31 December 2011).

	31/12/2012				31/12/2011
	Total	Maturity			Total
(in millions of Euros)		< 1 year	1 to 5 years	> 5 years	
CONFIRMED CREDIT LINES	8,598	637	7,961	-	10,179

The decrease in credit lines observed in 2012 mainly relates to EDF's credit lines with maturities shorter than one year.

## 38.2.6 Early repayment clauses

Project financing loans to EDF Énergies Nouvelles from non-Group parties generally include early repayment clauses, mainly applicable when the borrower fails to maintain a minimum Debt Service Coverage Ratio (DSCR). In general, early repayment clauses are activated when this ratio falls below 1.

No early repayment took place in 2012 as a result of any Group entity's failure to comply with contractual clauses concerning loans.

## 38.2.7 Fair value of loans and other financial liabilities

	31/12/2012		31/12/2011	
	Fair value	Net book value	Fair value	Net book value
<i>(in millions of Euros)</i>				
<b>LOANS AND OTHER FINANCIAL LIABILITIES</b>	<b>71,671</b>	<b>59,932</b>	<b>53,196</b>	<b>50,034</b>

## 38.3 Net indebtedness

Net indebtedness is not defined in the accounting standards and is not directly presented in the consolidated balance sheet. It comprises total loans and financial liabilities, less cash and cash equivalents and liquid assets. Liquid assets are financial assets consisting of funds or securities with initial maturity of over three months that are readily convertible into cash regardless of their maturity and are managed according to a liquidity-oriented policy.

Net indebtedness includes loans by the Group to RTE, which has been accounted for under the equity method since 31 December 2010, and loans to joint ventures for which contra entries are recognised in loans and other financial liabilities.

### 38.3.1 Net indebtedness

<i>(in millions of Euros)</i>	Notes	31/12/2012	31/12/2011
Loans and other financial liabilities	38.2.1	59,932	50,034
Derivatives used to hedge liabilities		(797)	(834)
Cash and cash equivalents	37	(5,874)	(5,743)
Liquid assets <sup>(1)</sup>	36.2	(10,289)	(9,024)
Loan to RTE and joint ventures <sup>(2)</sup>		(1,397)	(1,400)
Net indebtedness of assets held for sale		-	252
<b>NET INDEBTEDNESS</b>		<b>41,575</b>	<b>33,285</b>

(1) Available-for-sale financial assets: €10,289 million at 31 December 2012 (€9,024 million at 31 December 2011).

(2) Including €1,174 million of loans to RTE at 31 December 2012.

The investments in Edison and TdE in 2012, resulting in full consolidation of those companies in the EDF group's consolidated financial statements, led to a €3,259 million increase in net financial indebtedness at 31 December 2012 (see note 3.1.6).

## ➤ Note 39 Fair value of financial instruments

The following tables show the breakdown of financial assets and liabilities carried at fair value in the balance sheet, by level.

### 39.1 At 31 December 2012

<i>(in millions of Euros)</i>	Closing value	Level 1 Quoted prices	Level 2 Observable Data	Level 3 Internal Models
Financial assets carried at fair value with changes in fair value included in income <sup>(1)</sup>	3,179	16	2,942	221
Available-for-sale financial assets	27,253	4,363	22,275	615
Positive fair value of hedging derivatives	2,421	-	2,421	-
Cash equivalents carried at fair value	2,507	-	2,507	-
<b>Financial assets carried at fair value in the balance sheet</b>	<b>35,360</b>	<b>4,379</b>	<b>30,145</b>	<b>836</b>
Negative fair value of hedging derivatives	2,279	9	2,269	1
Negative fair value of trading derivatives	2,290	11	2,093	186
<b>Financial liabilities carried at fair value in the balance sheet</b>	<b>4,569</b>	<b>20</b>	<b>4,362</b>	<b>187</b>

(1) Including €3,162 million for the positive fair value of trading derivatives.

Level 3 available-for-sale financial assets are principally unconsolidated investments carried at historical value.

Cash equivalents, which principally take the form of negotiable debt instruments and short-term investments, are generally valued using rate curves, and therefore observable market data.

### 39.2 At 31 December 2011

<i>(in millions of Euros)</i>	Closing value	Level 1 Quoted prices	Level 2 Observable data	Level 3 Internal Models
Financial assets carried at fair value with changes in fair value included in income <sup>(1)</sup>	4,494	24	4,180	290
Available-for-sale financial assets	24,328	5,171	18,628	529
Positive fair value of hedging derivatives	2,776	-	2,776	-
Cash equivalents carried at fair value	3,246	40	3,206	-
<b>Financial assets carried at fair value in the balance sheet</b>	<b>34,844</b>	<b>5,235</b>	<b>28,790</b>	<b>819</b>
Negative fair value of hedging derivatives	2,010	-	2,009	1
Negative fair value of trading derivatives	3,433	17	3,177	239
<b>Financial liabilities carried at fair value in the balance sheet</b>	<b>5,443</b>	<b>17</b>	<b>5,186</b>	<b>240</b>

(1) Including €4,478 million for the positive fair value of trading derivatives.

## ➤ Note 40 Management of financial risks

As an operator in the energy sector worldwide, the EDF group is exposed to financial market risks, energy market risks and counterparty risks. All these risks are potential sources of volatility for the financial statements.

### ■ Financial market risks

The main financial market risks to which the Group is exposed are the liquidity risk, the foreign exchange risk, the interest rate risk and the equity risk.

The objective of the Group's liquidity risk management is to seek resources at optimum cost and ensure their constant accessibility.

The foreign exchange risk relates to the diversification of the Group's businesses and geographical locations, and results from exposure to the risk of exchange rate fluctuations. These fluctuations can affect the Group's translation differences, balance sheet items, financial expenses, equity and net income.

The interest rate risk results from exposure to the risk of rate fluctuations in interest rates that can affect the value of assets invested by the Group, or its financial expenses.

The Group is exposed to equity risks, particularly through its dedicated asset portfolio held for secure financing of long-term nuclear commitments, through external pension funds, and to a lesser extent through its cash assets and directly-held investments.

A more detailed description of these risks can be found in chapter 9.5.1 of the operating and financial review.

### ■ Energy market risks

With the opening of the end customer market, development of the wholesale markets and international business expansion, the EDF group is exposed to price variations on the energy market which can have a significant impact on its financial statements.

A more detailed description of these risks can be found in chapter 9.5.2 of the operating and financial review.

### ■ Counterparty risks

Counterparty risk is defined as the total loss that the EDF group would sustain on its business and market transactions if a counterparty defaulted and failed to perform its contractual obligations.

A more detailed description of these risks can be found in sections 9.5.1.7 of the operating and financial review.

Regarding the risk of customer default, which is another component of the counterparty risk, a statement of receivables not yet due and overdue is shown in note 25.

The sensitivity analyses required by IFRS 7 are presented in the operating and financial review:

- Foreign exchange risks: section 9.5.1.3;
- Interest rate risks on financing issued and financial assets: section 9.5.1.4;
- Equity risk on financial assets: sections 9.5.1.5 and 9.5.1.6.

The principal information on financial assets and liabilities is described by theme in the following notes and sections:

- Liquidity risks:
  - maturity of loans and other financial liabilities: note 38.2.2 to notes to the consolidated financial statements,
  - credit lines: note 38.2.5 to notes to the consolidated financial statements,
  - early repayment clauses for borrowings: note 38.2.6 to notes to the consolidated financial statements,
  - off balance sheet commitments: note 44 to notes to the consolidated financial statements.
- Foreign exchange risks:
  - Breakdown of loans by currency and interest rate: notes 38.2.3 and 38.2.4 to notes to the consolidated financial statements.
- Equity risks (in the operating and financial review – sections 9.5.1.5 and 9.5.1.6):
  - coverage of nuclear obligations: notes 44.1.1 and 29.1.5 to notes to the consolidated financial statements,
  - coverage of social obligations: notes 31.2.4 and 31.3.3 to notes to the consolidated financial statements,
  - long-term cash management,
  - direct investments.
- Interest rate risks:
  - discount rate for nuclear provisions: calculation method and sensitivity: note 29.1.5.1 to notes to the consolidated financial statements,
  - discount rate used for employee benefits: notes 31.2.5 and 31.3.4 to notes to the consolidated financial statements,
  - breakdown of loans by currency and interest rate: notes 38.2.3 and 38.2.4 to notes to the consolidated financial statements.
- Balance sheet treatment of financial and market risks:
  - derivatives and hedge accounting: note 41 to notes to the consolidated financial statements, and the statement of changes in equity,
  - derivatives not classified as hedges: note 42 to notes to the consolidated financial statements.

## ➤ Note 41 Derivatives and hedge accounting

Hedge accounting is applied in compliance with IAS 39, and concerns interest rate derivatives used to hedge long-term indebtedness, currency derivatives

used to hedge net foreign investments and debts in foreign currencies, and currency and commodity derivatives used to hedge future cash flows.

The fair value of hedging derivatives reported in the balance sheet breaks down as follows:

<i>(in millions of Euros)</i>	Notes	31/12/2012	31/12/2011
Positive fair value of hedging derivatives	36.1	2,421	2,776
Negative fair value of hedging derivatives	38.1	(2,279)	(2,010)
<b>FAIR VALUE OF HEDGING DERIVATIVES</b>		<b>142</b>	<b>766</b>
Interest rate hedging derivatives	41.4.1	675	337
Exchange rate hedges	41.4.2	(80)	679
Commodity-related cash flow hedges	41.4.3	(431)	(231)
Commodity-related fair value hedges	41.5	(22)	(19)

### 41.1 Fair value hedges

The EDF group hedges the exposure to changes in the fair value of fixed-rate debts. The derivatives used for this hedging are fixed/floating interest rate swaps and cross currency swaps, with changes in fair value recorded in the income statement. Fair value hedges also include currency hedging instruments on certain firm purchase commitments.

In 2012, the ineffective portion of fair value hedges represents a gain of €41 million (gain of €4 million in 2011), included in the financial result.

### 41.2 Cash flow hedges

The EDF group uses cash flow hedging principally for the following purposes:

- to hedge its floating-rate debt, using interest-rate swaps (floating/fixed rate);
- to hedge the exchange rate risk related to debts contracted in foreign currencies, using cross currency swaps;
- to hedge future cash flows related to expected sales and purchases of electricity, gas, and coal, using futures, forwards and swaps.

The EDF group also hedges the currency risk associated with fuel and commodity purchases.

In 2012, the ineffective portion of cash flow hedges represents a loss of €1 million (loss of €9 million in 2011).

### 41.3 Hedges of net investments in foreign entities

Hedging of net foreign investment is used for protection against exposure to the exchange rate risk related to net investments in the Group's foreign entities.

This risk is hedged at Group level either by contracting debts for investments in the same currency, or through the markets, in which case the Group uses currency swaps and forward exchange contracts.



## 41.4 Impact of hedging derivatives on equity

Changes during the period in the fair value of hedging instruments included in equity (EDF share) are detailed below:

	2012			2011		
	Gross changes in fair value recorded in equity <sup>(1)</sup>	Gross changes in fair value transferred to income – Recycling <sup>(2)</sup>	Gross changes in fair value transferred to income – Ineffectiveness	Gross changes in fair value recorded in equity <sup>(1)</sup>	Gross changes in fair value transferred to income – Recycling <sup>(2)</sup>	Gross changes in fair value transferred to income – Ineffectiveness
<i>(in millions of Euros)</i>						
Interest rate hedging	(42)	4	-	(156)	(1)	(9)
Exchange rate hedging	(608)	(264)	7	254	317	6
Net foreign investment hedging	(420)	-	-	(508)	-	-
Commodity hedging	(538)	(566)	-	(1,270)	(693)	-
<b>HEDGING DERIVATIVES</b>	<b>(1,608)</b>	<b>(826)</b>	<b>7</b>	<b>(1,680)</b>	<b>(377)</b>	<b>(3)</b>

(1) + / (-): increase / (decrease) in equity (EDF's share).

(2) + / (-): increase / (decrease) in income (EDF's share).

### 41.4.1 Interest rate hedging derivatives

Interest rate hedging derivatives break down as follows:

	Notional at 31/12/2012			Notional at 31/12/2011		Fair value	
	< 1 year	1 to 5 years	> 5 years	Total	Total	31/12/2012	31/12/2011
<i>(in millions of Euros)</i>							
Purchases of CAP contracts	50	20	-	70	98	-	-
Purchases of options	45	25	-	70	120	(1)	(1)
<b>Interest rate transactions</b>	<b>95</b>	<b>45</b>	<b>-</b>	<b>140</b>	<b>218</b>	<b>(1)</b>	<b>(1)</b>
Fixed rate payer/floating rate receiver	539	1,151	1,273	2,963	3,833	(342)	(304)
Floating rate payer/fixed rate receiver	613	1,865	5,539	8,017	5,991	1,172	705
Variable/variable	1,177	272	38	1,487	1,520	-	16
Fixed/Fixed	1,320	3,323	4,514	9,157	10,141	(154)	(79)
<b>Interest rate swaps</b>	<b>3,649</b>	<b>6,611</b>	<b>11,364</b>	<b>21,624</b>	<b>21,485</b>	<b>676</b>	<b>338</b>
<b>INTEREST RATE HEDGING DERIVATIVES</b>	<b>3,744</b>	<b>6,656</b>	<b>11,364</b>	<b>21,764</b>	<b>21,703</b>	<b>675</b>	<b>337</b>

The fair value of interest rate/exchange rate cross-currency swaps comprises the interest rate effect only.

The notional value of cross-currency swaps is included both in this note and the note on Exchange rate hedging derivatives (41.4.2).

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## 41.4.2 Exchange rate hedging derivatives

Exchange rate hedging derivatives break down as follows:

At 31 December 2012

(in millions of Euros)	Notional amount to be received				Notional amount to be given				Fair value
	< 1 year	1 to 5 years	> 5 years	Total	< 1 year	1 to 5 years	> 5 years	Total	31/12/2012
Forward exchange transactions	3,415	1,341	-	4,756	3,428	1,356	-	4,784	(22)
Swaps	14,617	5,875	4,690	25,182	14,603	5,694	4,956	25,253	(58)
Options	-	-	-	-	-	-	-	-	-
<b>EXCHANGE RATE HEDGING DERIVATIVES</b>	<b>18,032</b>	<b>7,216</b>	<b>4,690</b>	<b>29,938</b>	<b>18,031</b>	<b>7,050</b>	<b>4,956</b>	<b>30,037</b>	<b>(80)</b>

At 31 December 2011

(in millions of Euros)	Notional amount to be received				Notional amount to be given				Fair value
	< 1 year	1 to 5 years	> 5 years	Total	< 1 year	1 to 5 years	> 5 ans	Total	31/12/2011
Forward exchange transactions	4,704	1,755	-	6,459	4,656	1,744	-	6,400	75
Swaps	7,253	7,861	5,254	20,368	7,232	7,326	5,223	19,781	600
Options	90	-	-	90	93	-	-	93	4
<b>EXCHANGE RATE HEDGING DERIVATIVES</b>	<b>12,047</b>	<b>9,616</b>	<b>5,254</b>	<b>26,917</b>	<b>11,981</b>	<b>9,070</b>	<b>5,223</b>	<b>26,274</b>	<b>679</b>

The notional value of cross-currency swaps shown in this note is also included in the note on interest rate hedging derivatives (note 41.4.1).

## 41.4.3 Commodity-related cash flow hedges

For commodities, changes in fair value are mainly explained by:

(in millions of Euros)	31/12/2012	31/12/2011
Electricity hedging contracts	(142)	(489)
Gas hedging contracts	(73)	(62)
Coal hedging contracts	(371)	(591)
Oil product hedging contracts	104	42
CO <sub>2</sub> emission rights hedging contracts	(56)	(170)
<b>CHANGES IN FAIR VALUE BEFORE TAXES</b>	<b>(538)</b>	<b>(1,270)</b>

The main components of the amount transferred to income in respect of commodity hedges terminated during the year are:

(in millions of Euros)	31/12/2012	31/12/2011
Electricity hedging contracts	(296)	(530)
Gas hedging contracts	12	90
Coal hedging contracts	(280)	(348)
Oil product hedging contracts	35	106
CO <sub>2</sub> emission rights hedging contracts	(37)	(11)
<b>CHANGES IN FAIR VALUE BEFORE TAXES</b>	<b>(566)</b>	<b>(693)</b>

Details of commodity-related cash flow hedges are as follows:

(in millions of Euros)	Units of measure	31/12/2012				31/12/2011	
		Net notional				Fair value	Net notional
		< 1 year	1 to 5 years	> 5 years	Total		Fair value
						Total	
Swaps		-	-	-	-	-	1
Forwards/futures		3	(3)	-	-	(5)	2
<b>Electricity</b>	<b>TWh</b>	<b>3</b>	<b>(3)</b>	<b>-</b>	<b>-</b>	<b>(5)</b>	<b>15</b>
Swaps		(296)	8	-	(288)	1	(9)
Forwards/futures		685	1,282	-	1,967	(39)	(72)
<b>Gas</b>	<b>Millions of therms</b>	<b>389</b>	<b>1,290</b>	<b>-</b>	<b>1,679</b>	<b>(38)</b>	<b>1,579</b>
Swaps		21,801	5,907	-	27,708	45	(81)
<b>Oil products</b>	<b>Thousands of barrels</b>	<b>21,801</b>	<b>5,907</b>	<b>-</b>	<b>27,708</b>	<b>45</b>	<b>7,046</b>
Swaps		10	4	-	14	(168)	130
<b>Coal</b>	<b>Millions of tonnes</b>	<b>10</b>	<b>4</b>	<b>-</b>	<b>14</b>	<b>(168)</b>	<b>12</b>
Forwards/futures		29,356	7,365	-	36,721	(265)	39
<b>CO<sub>2</sub></b>	<b>Thousands of tonnes</b>	<b>29,356</b>	<b>7,365</b>	<b>-</b>	<b>36,721</b>	<b>(265)</b>	<b>16,391</b>
Other commodities						-	(127)
<b>COMMODITY-RELATED CASH FLOW HEDGES</b>						<b>(431)</b>	<b>(231)</b>

## 41.5 Commodity-related fair value hedges

Details of commodity-related fair value hedges are as follows:

(in millions of Euros)	Units of measure	31/12/2012		31/12/2011	
		Net notional	Fair value	Net notional	Fair value
Gas (swaps)	Millions of therms	49	-	52	1
Coal and freight	Millions of tonnes	(32)	(22)	(15)	(20)
<b>COMMODITY-RELATED FAIR VALUE HEDGES</b>			<b>(22)</b>		<b>(19)</b>

## ➤ Note 42 Derivatives not classified as hedges

Details of the fair value of trading derivatives reported in the balance sheet are as follows:

(in millions of Euros)	Notes	31/12/2012	31/12/2011
Positive fair value of trading derivatives	36.2	3,162	4,478
Negative fair value of trading derivatives	38.1	(2,290)	(3,433)
<b>FAIR VALUE OF TRADING DERIVATIVES</b>		<b>872</b>	<b>1,045</b>
Interest rate derivatives held for trading	42.1	(92)	(42)
Currency derivatives held for trading	42.2	(21)	(35)
Non-hedging commodity derivatives	42.3	985	1,122

### 42.1 Interest rate derivatives held for trading

Interest rate derivatives held for trading break down as follows:

	Notional at 31/12/2012			Notional at 31/12/2011		Fair value	
(in millions of Euros)	< 1 year	1 to 5 years	> 5 years	Total	Total	31/12/2012	31/12/2011
Fixed rate payer/floating rate receiver	2,369	904	573	3,846	4,562	(248)	(279)
Floating rate payer/fixed rate receiver	2,738	823	351	3,912	3,957	182	242
Variable/variable	200	725	-	925	355	(26)	(5)
<b>INTEREST RATE DERIVATIVES HELD FOR TRADING</b>	<b>5,307</b>	<b>2,452</b>	<b>924</b>	<b>8,683</b>	<b>8,874</b>	<b>(92)</b>	<b>(42)</b>

### 42.2 Currency derivatives held for trading

Currency derivatives held for trading break down as follows:

#### ■ At 31 December 2012

	Notional amount to be received				Notional amount to be given				Fair value
(in millions of Euros)	< 1 year	1 to 5 years	> 5 years	Total	< 1 year	1 to 5 years	> 5 years	Total	31/12/2012
Forward transactions	4,060	425	49	4,534	4,085	433	52	4,570	(32)
Swaps	6,446	131	-	6,577	6,435	133	-	6,568	11
Options	-	-	-	-	-	-	-	-	-
<b>CURRENCY DERIVATIVES HELD FOR TRADING</b>	<b>10,506</b>	<b>556</b>	<b>49</b>	<b>11,111</b>	<b>10,520</b>	<b>566</b>	<b>52</b>	<b>11,138</b>	<b>(21)</b>

■ At 31 December 2011

(in millions of Euros)	Notional amount to be received				Notional amount to be given				Fair value
	< 1 year	1 to 5 years	> 5 years	Total	< 1 year	1 to 5 years	> 5 years	Total	31/12/2012
Forward transactions	3,177	461	26	3,664	3,165	475	32	3,672	(10)
Swaps	2,171	144	11	2,326	2,175	144	12	2,331	(25)
Options	33	-	-	33	37	-	-	37	-
<b>CURRENCY DERIVATIVES HELD FOR TRADING</b>	<b>5,381</b>	<b>605</b>	<b>37</b>	<b>6,023</b>	<b>5,377</b>	<b>619</b>	<b>44</b>	<b>6,040</b>	<b>(35)</b>

## 42.3 Non-hedging commodity derivatives

Details of commodity derivatives not classified as hedges are as follows:

(in millions of Euros)	Units of measure	31/12/2012		31/12/2011	
		Net notional	Fair value	Net notional	Fair value
Swaps		3	715	(5)	485
Options		76	53	36	31
Forwards/futures		(42)	250	(14)	663
<b>Electricity</b>	<b>TWh</b>	<b>37</b>	<b>1,018</b>	<b>17</b>	<b>1,179</b>
Swaps		4,023	(10)	6	12
Options		25,118	-	16,022	81
Forwards/futures		(2,002)	(363)	591	(263)
<b>Gas</b>	<b>Millions of therms</b>	<b>27,139</b>	<b>(373)</b>	<b>16,619</b>	<b>(170)</b>
Swaps		64	10	133	17
Options		(187)	(1)	1	-
Forwards/futures		(218)	(1)	(81)	-
<b>Oil products</b>	<b>Millions of barrels</b>	<b>(341)</b>	<b>8</b>	<b>53</b>	<b>17</b>
Swaps		(45)	(170)	(48)	(632)
Forwards/futures		123	110	87	607
Freight		31	157	15	46
<b>Coal and freight</b>	<b>Millions of tonnes</b>	<b>109</b>	<b>97</b>	<b>54</b>	<b>21</b>
Swaps		(386)	27	(561)	-
Options		(546)	(2)	3,370	(2)
Forwards/futures		49,117	212	9,007	115
<b>CO<sub>2</sub></b>	<b>Thousands of tonnes</b>	<b>48,185</b>	<b>237</b>	<b>11,816</b>	<b>113</b>
Swaps			(6)		(40)
<b>Other</b>			<b>(6)</b>		<b>(40)</b>
<b>Embedded commodity derivatives</b>			<b>4</b>		<b>2</b>
<b>NON-HEDGING COMMODITY DERIVATIVES</b>			<b>985</b>		<b>1,122</b>

These mainly include contracts included in EDF Trading's portfolio.



## CASH FLOWS AND OTHER INFORMATION

### ➤ Note 43 Cash flows

#### 43.1 Change in working capital

<i>(in millions of Euros)</i>	2012	2011
Change in inventories	(508)	(1,031)
Change in the CSPE receivable	(1,426)	(1,009)
Change in trade receivables	(510)	(567)
Change in trade payables	(27)	(5)
Change in other receivables and payable (excluding CSPE)	81	827
<b>CHANGE IN WORKING CAPITAL</b>	<b>(2,390)</b>	<b>(1,785)</b>

#### 43.2 Investments in intangible assets and property, plant and equipment

<i>(in millions of Euros)</i>	2012	2011
Acquisitions of intangible assets	(817)	(544)
Acquisitions of tangible assets	(12,798)	(10,790)
Change in payables to suppliers of fixed assets	229	200
<b>INVESTMENTS IN INTANGIBLE ASSETS AND PROPERTY, PLANT AND EQUIPMENT</b>	<b>(13,386)</b>	<b>(11,134)</b>

### ➤ Note 44 Off-balance sheet commitments

This note presents off balance sheet commitments given and received by the Group at 31 December 2012. The changes observed in 2012 include the effect of full consolidation of Edison since 24 May 2012. The amounts of commitments correspond to non-discounted contractual values.

#### 44.1 Commitments given

The table below shows off-balance sheet commitments given by the Group that have been valued at 31 December 2012. Other commitments are described separately in the detailed notes.

<i>(in millions of Euros)</i>	Notes	31/12/2012	31/12/2011
Fuel and energy purchase commitments	44.1.1	30,931	29,718
Operating contract performance commitments	44.1.2	20,529	19,791
Operating lease commitments as lessee	44.1.3	4,165	2,525
Investment commitments given	44.1.4	367	629
Financing commitments given	44.1.5	5,449	3,906
<b>TOTAL COMMITMENTS GIVEN</b>		<b>61,441</b>	<b>56,569</b>

### 44.1.1 Fuel and energy purchase commitments

In the course of its ordinary generation and supply activities, the Group has entered into long-term contracts for purchases of electricity, gas, other energies and commodities, as well as nuclear fuels, for periods of up to 20 years.

In almost all cases, these are reciprocal commitments, and the third parties concerned are under an obligation to supply the quantities specified in the contracts. EDF has also entered into long-term purchase contracts with a certain number of electricity producers, by contributing to the financing of power plants.

At 31 December 2012, fuel and energy purchase commitments mature as follows:

	Total	31/12/2012				31/12/2011
		Maturity				Total
		< 1 year	1 to 5 years	5 to 10 years	> 10 years	
(in millions of Euros)						
Electricity purchases and related services	7,676	2,060	2,482	1,119	2,015	9,467
Other energy and commodity purchases <sup>(1)</sup>	1,458	683	761	14	-	1,553
Nuclear fuel purchases	21,797	2,675	6,991	6,760	5,371	18,698
<b>FUEL AND ENERGY PURCHASE COMMITMENTS</b>	<b>30,931</b>	<b>5,418</b>	<b>10,234</b>	<b>7,893</b>	<b>7,386</b>	<b>29,718</b>

(1) Excluding gas purchases.

Most of the changes result from the increase in commitments to purchase nuclear fuel, partially offset by the lower level of electricity purchase contracts, especially at EDF.

#### 44.1.1.1 Electricity purchases and related services

Electricity purchase commitments mainly concern EDF, and are mostly for Island Energy Systems (IES), which has made commitments to purchase the electricity generated using bagasse and coal, ERDF and EDF Energy.

In addition to the obligations reported above and under article 10 of the Law of 10 February 2000, in mainland France EDF is obliged, at the producer's request and subject to compliance with certain technical features, to purchase the power produced by co-generation plants and renewable energy generation units (wind turbines and small hydro-electric plants, photovoltaic power, etc). The additional costs generated by this obligation are offset, after validation by the CRE, by the Contribution to the Public Electricity Service (*Contribution au Service Public de l'Électricité* or CSPE). These purchase obligations total 36 TWh for 2012 (33 TWh for 2011), including 10 TWh for co-generation (12 TWh for 2011), 14 TWh for wind power (12 TWh for 2011), 4 TWh for photovoltaic power (2 TWh for 2011) and 3 TWh for hydropower (3 TWh for 2011).

#### 44.1.1.2 Other energy and commodity purchases

Purchase commitments for other energies and commodities mainly concern coal and oil used to operate the fossil-fired plants.

#### 44.1.1.3 Nuclear fuel purchases

Commitments for purchases of nuclear fuel arise from supply contracts for the nuclear plants intended to cover the EDF group's needs for uranium and fluorination, enrichment and fuel assembly production services.

The increase in these commitments mainly results from the signature of new contracts or amendments in 2012, amounting to €4.8 billion.

#### 44.1.1.4 Gas purchases and related services

Gas purchase commitments are principally undertaken by Edison.

Edison has entered into agreements to import natural gas from Russia, Libya, Algeria and Qatar, for total supplies of 14.4 billion m<sup>3</sup> per year. These contracts contain "take-or-pay" clauses committing the buyer to pay for a minimum volume of gas every year, whether or not it actually takes delivery of that volume. At 31 December 2012, off-balance sheet commitments under Edison's take-or-pay clauses amount to €414 million, corresponding to the value of the volumes of gas not withdrawn at that date, for which delivery is deferred to a subsequent period.

Under the contract with Terminale GNL Adriatico, a gas liquefaction unit in operation since October 2009 in which Edison has a 7.3% holding, Edison also benefits from approximately 80% of the terminal's regasification capacities until 2034, for an annual premium of approximately €100 million.

Gas purchase commitments have also been given by EDF, in connection with its expanding gas supply business, and by subsidiaries for which these commitments are generally covered by electricity sale agreements which include "pass-through" clauses allowing almost all fluctuations in supply source costs to be passed on to the customer.

## 44.1.2 Operating contract performance commitments given

(in millions of Euros)	Total	31/12/2012			31/12/2011
		Maturity			Total
		< 1 year	1 to 5 years	> 5 years	
Satisfactory performance, completion and bid guarantees	486	157	186	143	566
Commitments related to orders for operating items <sup>(1)</sup>	4,379	2,620	1,253	506	4,354
Commitments related to orders for fixed assets	11,657	5,962	5,080	615	12,083
Other operating commitments	4,007	2,138	1,131	738	2,788
<b>OPERATING CONTRACT PERFORMANCE COMMITMENTS GIVEN</b>	<b>20,529</b>	<b>10,877</b>	<b>7,650</b>	<b>2,002</b>	<b>19,791</b>

(1) Excluding fuel and energy.

In the course of its business, the Group provides contract performance guarantees, generally through the intermediary of banks.

Satisfactory performance, completion and bid guarantees at 31 December 2012 mainly consist of guarantees given by EDF Énergies Nouvelles in connection with its development projects and Dalkia International.

At 31 December 2012, commitments related to orders for operating items and fixed assets break down as follows:

(in millions of Euros)	31/12/2012			31/12/2011		
	Commitments related to orders for operating items	Commitments related to orders for fixed assets	Total	Commitments related to orders for operating items	Commitments related to orders for fixed assets	Total
EDF SA	2,420	7,908	10,328	2,410	6,882	9,292
ERDF	426	930	1,356	427	800	1,227
EDF Énergies Nouvelles	611	600	1,211	670	1,538	2,208
EDF Energy	622	603	1,225	509	758	1,267
PEI <sup>(1)</sup>	-	414	414	-	844	844
Dunkerque LNG <sup>(2)</sup>	-	656	656	-	783	783
Other entities	300	546	846	338	478	816
<b>COMMITMENTS RELATED TO ORDERS</b>	<b>4,379</b>	<b>11,657</b>	<b>16,036</b>	<b>4,354</b>	<b>12,083</b>	<b>16,437</b>

(1) Principally commitments related to construction of fossil-fired plants.

(2) Principally commitments related to construction of the methane terminal at Dunkirk.

The decrease in orders for fixed assets by EDF Énergies Nouvelles essentially concerns orders for turbines, particularly in the USA and Canada, and solar panels in France.

Other operating commitments mainly concern EDF SA (€1,017 million compared to €728 million in 2011) and Edison (€1,292 million, compared to €683 million in 2011). At Edison, the change in consolidation method explains €713 million of the rise in commitments at 31 December 2012.

### 44.1.3 Operating lease commitments as lessee

At 31 December 2012, operating lease commitments as lessee break down as follows:

	Total	31/12/2012			31/12/2011
		Maturity			Total
		< 1 year	1 to 5 years	> 5 years	
(in millions of Euros)					
<b>OPERATING LEASE COMMITMENTS AS LESSEE</b>	<b>4,165</b>	<b>514</b>	<b>1,784</b>	<b>1,867</b>	<b>2,525</b>

The Group is bound as lessee by irrevocable operating lease contracts, principally for premises, equipment and vehicles used in the course of its business and maritime freight contracts for trading activities. The corresponding rents are subject to renegotiation at intervals defined in the contracts. Operating leases mainly concern EDF, EDF Énergies Nouvelles and EDF Trading.

The change in the year essentially relates to new contracts for real estate commitments undertaken by EDF.

### 44.1.4 Investment commitments given

At 31 December 2012, commitments related to investments are as follows:

	Total	31/12/2012			31/12/2011
		Maturity			Total
		< 1 year	1 to 5 years	> 5 years	
(in millions of Euros)					
Investment commitments	333	281	13	39	427
Other commitments related to investments	34	28	4	2	202
<b>INVESTMENT COMMITMENTS GIVEN</b>	<b>367</b>	<b>309</b>	<b>17</b>	<b>41</b>	<b>629</b>

#### 44.1.4.1 Investment commitments

Investment commitments at 31 December 2011 included the commitment to purchase EnBW's holdings in Polish entities for €301 million. The Group undertook these purchases on 16 February 2012.

At 31 December 2012, these commitments include the share purchase commitments related to EDF Énergies Nouvelles' takeover of Iberdrola's French onshore wind farms, and shares in the Electranova Capital fund.

The residual commitments principally concern the following operations:

- **Agreement with Veolia Environnement**  
Veolia Environnement has granted EDF a call option on all its Dalkia shares in the event that a competitor of EDF takes control over Veolia Environnement. EDF has also granted Veolia Environnement a call option over all its Dalkia shares in the event that the status of EDF should change and a competitor of Veolia Environnement, individually or with other parties, should take control over EDF. If the parties fail to agree on the sale price of the shares, it is to be fixed by an independent expert.
- **Commitment by EDF Energy to Centrica**  
Centrica has a 20% investment in the project company in charge of constructing four EPRs in the United Kingdom. EDF Energy holds the other 80%.

At 31 December 2012, Centrica had a put option to sell this investment to EDF, to be triggered by criteria related to the pre-development budget, or exercised just before the final investment decision for the first EPR. On 4 February 2013, Centrica announced its decision to exercise this put option (see note 51.2), which due to its value does not constitute a significant commitment for the Group.

- In connection with the formation of EDF Investissements Groupe, C3 (a wholly-owned EDF subsidiary) signed unilateral promises with NBI (Natixis Belgique Investissement, a subsidiary of the Natixis group) to buy and sell shares in investments held respectively by NBI and C3. NBI thus allows C3 to purchase NBI's investment at any time based on the net asset value of EDF Investissements Groupe until 2030. At 31 December 2012, C3's option to sell its total investment to NBI expired.

#### 44.1.4.2 Other commitments related to investments

At 31 December 2011, these commitments essentially comprised Dalkia International's obligation to invest in the Warsaw network (as part of the acquisition of Spec).

## 44.1.5 Financing commitments given

Financing commitments given by the Group at 31 December 2012 comprise the following:

	Total	31/12/2012			31/12/2011
		Maturity			Total
		< 1 year	1 to 5 years	> 5 years	
<i>(in millions of Euros)</i>					
Security interests in real property	4,906	193	1,389	3,324	3,449
Guarantees related to borrowings	218	11	40	167	158
Other financing commitments	325	170	83	72	299
<b>FINANCING COMMITMENTS GIVEN</b>	<b>5,449</b>	<b>374</b>	<b>1,512</b>	<b>3,563</b>	<b>3,906</b>

Security interests and assets provided as guarantees mainly concern pledges or mortgages of tangible assets and shares representing investments in consolidated subsidiaries which own property, plant and equipment. The net book value of current and non-current assets given as guarantees is €4,906 million at 31 December 2012 (€3,449 million in 2011), up by €1,457 million.

Most financing commitments were given by EDF Énergies Nouvelles. The increase in these commitments over 2012 primarily reflects the financing of new fleets in the US and UK.

## 44.2 Commitments received

The table below shows off-balance sheet commitments received by the Group that have been valued at 31 December 2012. Other commitments are described separately in the detailed notes.

	Notes	Total	31/12/2012			31/12/2011
			Maturity			Total
			< 1 year	1 to 5 years	> 5 years	
<i>(en millions d'euros)</i>						
Operating commitments	44.2.1	1,557	1,096	358	103	1,871
Operating lease commitments as lessor	44.2.3	1,379	289	748	342	1,268
Investment commitments received	44.2.4	17	-	17	-	18
Financing commitments received	44.2.5	129	25	9	95	239
<b>TOTAL COMMITMENTS RECEIVED <sup>(1)</sup></b>		<b>3,082</b>	<b>1,410</b>	<b>1,132</b>	<b>540</b>	<b>3,396</b>

(1) Excluding electricity supply commitments detailed in note 44.2.2 and credit lines presented in note 38.2.5.



### 44.2.1 Operating commitments received

Operating commitments received essentially concern EDF at 31 December 2012.

### 44.2.2 Electricity supply commitments

In the course of its business, the EDF group has signed long-term contracts to supply electricity as follows:

- Long-term contracts with a number of European electricity operators, for a specific plant or for a defined group of plants in the French nuclear generation fleet, corresponding to installed power capacity of 3.5 GW. 26.2 TWh were supplied under these contracts in 2012.
- In execution of France's NOME law on organisation of the French electricity market, EDF has a commitment to sell some of the energy generated by its "traditional" nuclear power plants to other suppliers. This covers volumes of up to 100 TWh each year until 31 December 2025 (66.4 TWh for 2012).
- In the United Kingdom, EDF made a commitment in 2009 to supply an additional 18 TWh of electricity to Centrica at market prices for a 5-year period starting in 2011. This relates to an obligation to put certain volumes of electricity on the market between 2012 and 2015, required by the European Commission on 22 December 2008 as a condition for the EDF group's acquisition of British Energy. The residual commitment at 31 December 2012 concerns a volume of 12.8 TWh.
- EDF is still committed to supplying the residual volumes of 12 TWh by March 2015, in application of the rights acquired at VPP or Virtual Power Plant capacity auctions, which ended in 2011.

In France, a ruling by the French competition authorities (*Conseil de la concurrence*) on 10 December 2007 required EDF to tender a significant capacity of electricity (1,500 MW, i.e. approximately 10 TWh per year for 15 years) to alternative energy suppliers at prices enabling them to compete effectively with EDF's offers on the deregulated mass market. All of these contracts have been terminated by the subscribing counterparties, and EDF no longer has any related electricity supply commitments at 31 December 2012.

### 44.2.3 Operating lease commitments as lessor

The Group has commitments as lessor in operating leases amounting to €1,379 million.

Most of these commitments derive from contracts classified as operating leases under IFRIC 4, "Determining whether an arrangement contains a lease". They mainly concern the Asian Independent Power Projects (IPPs).

### 44.2.4 Investment commitments received

No significant investment commitment received exists at 31 December 2012.

### 44.2.5 Financing commitments received

No significant financing commitment received exists at 31 December 2012.

## ➤ Note 45 Contingent liabilities

### 45.1 Proceedings by the Baden-Württemberg region/EnBW

In February 2012, EDF International received a request for arbitration filed with the International Chamber of Commerce by the German company Neckarpri GmbH, the vehicle for the Baden-Württemberg region's acquisition of the EDF group's stake in EnBW, which was agreed on 6 December 2010 and completed on 17 February 2011.

Neckarpri claims that the price paid for the EDF group's investment in EnBW was excessive and therefore constitutes illegal State aid. On those grounds, it is claiming reimbursement of the allegedly excess portion of the price. This was initially estimated at €2 billion in the request for arbitration, but was re-estimated at €834 million in July 2012 in an independent report on the valuation of EnBW commissioned by Baden-Württemberg. As an alternative Neckarpri is seeking cancellation of the sale of the EDF group's stake in EnBW.

The arbitration procedure is currently in process. EDF considers this claim unfounded and a misuse of law, and intends to sue for damages for all the kinds of prejudices caused by this action.

### 45.2 General network – rejection of the European Commission's appeal

On 15 December 2009, the European Union Court cancelled the European Commission's decision of 16 December 2003 that had classified the tax treatment of provisions created for the renewal of the General Network at the time of EDF's capital increase in 1997 as state aid, and ordered repayment to the French State of the updated value, i.e. €1,224 million (paid by EDF in February 2004). The State therefore reimbursed this amount to EDF on 30 December 2009, then in February 2010 the European Commission filed an appeal before the Court of Justice of the European Union.

On 5 June 2012, the Court of Justice of the European Union issued a decision rejecting the European Commission's appeal and upheld the European Union Court's decision of 15 December 2009.

### 45.3 Tax inspections

#### EDF

In 2008 and 2009 EDF underwent a tax inspection covering the tax years 2004, 2005 and 2006.

One of the grounds for reassessment concerns the tax-deductibility of the provision for annuities following work-related accidents and illness; as this is an issue that relates to the special gas and electricity (IEG) statutes, it also concerns RTE, ERDF and Électricité de Strasbourg. The Group is contesting the tax authorities' position on the deductibility of this provision. In late 2011 the National Commission of direct taxes and sales taxes issued an opinion supporting EDF's position on the principal grounds for reassessment arising from the inspection of the years 2004 to 2006, notably confirming the deductibility of the provision for annuities following work-related accidents and illness. If the outcome of this dispute is unfavourable, the financial risk for the Group (payment of back income taxes) could amount to some €250 million. The reassessment demand was sent to the Company in late 2011. A complaint applying for suspension of this demand was sent to the tax administration in

2012 to initiate the formal dispute procedure, but no answer had been received by the end of the year.

During 2010, a further inspection was begun of the years 2007 and 2008, and in late 2011 EDF was notified of a proposed rectification for 2008. EDF is contesting most of the tax reassessments, amounting to approximately €900 million, concerning deductibility of certain long-term liabilities. The administration confirmed these reassessments in 2012. The Company considers it is likely to win this dispute, and no provision has been established for the principal grounds for tax reassessment.

The tax administration has also proposed a reassessment following inspections of 2008 and 2009, concerning an interest-free advance made by EDF to its indirect subsidiary Lake Acquisitions Ltd in connection with the acquisition of British Energy. EDF is contesting this reassessment.

Finally, another inspection has started in 2012 related to years 2009 and 2010. Late in the year the Company received a proposed rectification, of a non-significant amount, for 2009. EDF is contesting this proposed rectification.

#### EDF International

The tax inspection of EDF International for the years 2008 and 2009 led to a proposed rectification received in late 2011. Two main reassessments amounting to some €135 million concerned the amount of the loss on the contribution of CEG shares to the American subsidiary EDF Inc. which arose in late 2009 and was deducted from EDF International's income, and the valuation of the bond convertible into shares issued to refinance the acquisition of British Energy. In 2012 EDF International contested these reassessments, and considers it has good chances of winning the dispute. In late 2012 EDF International began amicable proceedings, involving France and the USA and based on the US-France tax treaty concerning the valuation of CEG shares at the time of the contribution.

### 45.4 Labour litigation

EDF is party to a number of labour lawsuits with employees and employment inspectors, primarily regarding calculation and implementation of legislation regarding working hours. EDF estimates that none of these lawsuits, individually, is likely to have a significant impact on its profits and financial position. However, because they concern situations likely to concern a large number of EDF's employees in France, any increase in such litigations could present a risk with a potentially significant, negative impact on the Group's financial results. The number of these litigation cases is nonetheless small at the time of preparing this report.

### 45.5 ERDF – appeal against the TURPE 3 tariff decisions

On 28 November 2012, the Council of State announced the cancellation of the decisions of 5 May and 5 June 2009 setting the TURPE 3 distribution network access tariff.

The grounds for cancellation concerned the method used to calculate weighted average cost of capital (WACC): the Council of State judged this method "an error in law" because it does not take account of "the special concession accounts, which correspond to the grantor's rights to recover concession assets for no consideration at the end of the contract (...) and the provisions for renewal of assets".

This cancellation will be effective from 1 June 2013. In the meantime, the CRE (French market regulator) must propose new distribution tariffs for approval by the Ministers of the Economy and Energy, taking into account the

decision of the Council of State, and these tariffs will replace the cancelled tariffs retroactively. The new tariff decision is currently in preparation.

EDF does not expect this decision to have any significant consequences for the Group's results.

### 45.6 ERDF – litigation with photovoltaic producers

Photovoltaic installations benefit from an obligation incumbent on EDF (or local distribution companies) to purchase the electricity they generate on terms defined by public regulations that have so far provided an incentive for photovoltaic energy. This system encouraged early development of photovoltaic power in France, but the resulting pace of growth in the sector was considered too fast, and the French government followed up a series of decisions lowering the purchase tariffs (12 January, 16 March, and 31 August 2010) by a "moratorium decree" on 9 December 2010: this decree suspended conclusion of new contracts for a three-month period and stipulated that applications for which the technical and financial proposals had not been adopted by 2 December 2010 would have to be resubmitted after that three-month period, based on a photovoltaic power purchase tariff set in a new decision. This decision was issued on 4 March 2011 and significantly reduced the purchase price for photovoltaic electricity.

In anticipation of the coming tariff changes, there was an upsurge in the number of applications from photovoltaic operators for connection received by ERDF's units, particularly in August 2010. Despite the significant measures taken to process these applications, ERDF was not always able to issue technical and financial proposals in time for the power generators to benefit from the pre-4 March 2011 tariffs.

A Council of State decision of 16 November 2011 rejecting appeals against the moratorium decree of December 2010 generated a large volume of legal proceedings against ERDF in November and December 2011, and also, although at a slower pace, throughout 2012. Most actions were initiated by generators who found themselves forced to abandon their projects because the new electricity purchase tariffs made operating conditions less favourable; they consider ERDF responsible for this situation since it

did not issue the technical and financial connection proposals in time for them to benefit from more advantageous electricity purchase terms. ERDF considers that it cannot be held liable, and has lodged appeals against the small number of first instance rulings against it issued in 2011 and 2012.

### 45.7 EDF Énergies Nouvelles – Silpro

Silpro (Silicium de Provence) entered court-ordered liquidation on 4 August 2009. The EDF ENR group held a 30% minority interest in Silpro alongside the principal shareholder, the German company Sol Holding. On 30 May 2011, the liquidator ordered the shareholders and managers of Silpro to jointly repay the shortfall in assets resulting from Silpro's liquidation, which amounts to €101 million. After examining the situation, the Group does not consider it necessary to recognise a provision.

### 45.8 Edison – appeal by Carlo Tassara

Carlo Tassara, a company that was Edison's largest minority shareholder, initiated action on 12 July 2012 before the Lazio (Rome) Regional Administrative Court, seeking an increase in the price of the mandatory tender offer for Edison shares launched by EDF's subsidiary Transalpina di Energia (TdE) after the takeover of Edison on 24 May 2012. This action was brought against the Italian financial market authority CONSOB, EDF and its Italian subsidiaries (MNTC, WGRM4 et TdE), Edison, Delmi and A2A. No date has yet been set for the court hearing, and any ruling would be open to appeal before the Italian Council of State.

In parallel, in May 2012 Carlo Tassara submitted an application to the Consob for an increase in the price of the mandatory tender offer, based on practically identical arguments to those used in the proceedings on the substance of the matter before the Administrative Court. The Consob rejected this application on 25 July 2012, and no appeal was made.

EDF considers that Carlo Tassara has not provided any evidence to challenge the offer price as confirmed by the Consob, and that these proceedings are unfounded.

## ➤ Note 46 Held-for-sale assets and liabilities

<i>(in millions of Euros)</i>	<b>31/12/2012</b>	31/12/2011
Assets classified as held for sale	<b>241</b>	<b>701</b>
Liabilities related to assets classified as held for sale	<b>49</b>	<b>406</b>

Held-for-sale assets and liabilities as stated in the balance sheet at 31 December 2011 correspond to Edison's investment in Edipower, which was sold on 24 May 2012 (see note 3.1).

## ➤ Note 47 Contribution of joint ventures

The joint ventures' contributions to the consolidated balance sheet and income statement are as follows:

### At 31 December 2012:

	% of ownership	Current assets	Non-current assets	Current liabilities	Non-current liabilities	Sales	Operating profit before depreciation and amortisation
<i>(in millions of Euros)</i>							
CENG	49.99%	458	4,537	104	1,789	552	155
Other		2,546	3,962	1,959	1,213	3,489	507
<b>TOTAL</b>		<b>3,004</b>	<b>8,499</b>	<b>2,063</b>	<b>3,002</b>	<b>4,041</b>	<b>662</b>

### At 31 December 2011:

	% of ownership	Current assets	Non-current assets	Current liabilities	Non-current liabilities	Sales	Operating profit before depreciation and amortisation
<i>(in millions of Euros)</i>							
Edison	48.96%	2,106	5,002	1,744	2,176	6,068	480
CENG	49.99%	424	4,866	106	1,781	542	194
Other		3,231	6,654	3,028	781	3,195	456
<b>TOTAL</b>		<b>5,761</b>	<b>16,522</b>	<b>4,878</b>	<b>4,738</b>	<b>9,805</b>	<b>1,130</b>

"Other" mainly concerns Dalkia International and EDF Investissements Groupe.

## ➤ Note 48 Dedicated assets

### 48.1 Regulations

The French law of 28 June 2006 and the implementing regulations require assets (dedicated assets) to be set aside for secure financing of nuclear plant decommissioning expenses and long-term storage expenses for radioactive waste (spent fuel and fuel recovered from decommissioning). The regulations govern the way dedicated assets are built up, and the management and governance of the funds themselves. These assets are clearly identified and managed separately from the company's other financial assets and investments. They are also subject to specific monitoring and control by the Board of Directors and the administrative authorities.

The initial aim of these laws and regulations was to cover the full present cost of long-term nuclear obligations by 29 June 2011. The NOME law enacted in 2010 introduced a 5-year extension, subject to certain conditions, of the deadline for constitution of dedicated assets.

The decree of 29 December 2010 made RTE shares eligible for dedicated assets, subject to certain conditions and administrative authorisation. Since the conditions were fulfilled and authorisation was received, 50% of EDF's shares in RTE were allocated to dedicated assets on 31 December 2010.

### 48.2 Portfolio contents and measurement

EDF's dedicated assets consist of diversified bond and equity investments, and since 31 December 2010 after the administrative authority gave its approval, 50% of the shares in RTE. Given the applicable regulations, these dedicated assets are a highly specific category of assets.

#### 48.2.1 Diversified bond and equity investments

Certain dedicated assets take the form of bonds held directly by EDF. The rest comprise specialised collective investment funds on leading international markets, managed by independent asset management companies. They take the form of open-end funds and "reserved" funds established solely for the use of the Group (which does not participate in the fund management).

This portfolio is structured and managed according to a strategic allocation defined by the Board of Directors and reported to the administrative authorities. The strategic allocation is designed to meet the overall objective of long-term coverage of obligations, and determines the structure and management of the portfolio as a whole. It also takes into consideration international stock market cycles (for which the statistical inversion generally observed between equity market cycles and bond market cycles – as well as between geographical areas – has led the Group to define an overall composite benchmark indicator), and continuation of the long-term investment policy.

As a result, for accounting purposes the portfolio is evaluated as a whole, all funds combined, treating the cash flows generated as a group of financial assets. This ensures consistency with the specificities of the dedicated asset portfolio, in particular the legal association with the liability and the distant timing of significant payments – the first important due date is not until 2021, and payments continue until 2117 for the plants currently in operation.

At the year-end, dedicated assets are presented in available-for-sale financial assets in the balance sheet, at their liquidation value. In view of the specific financial characteristics of the portfolio of dedicated assets, the Group has exercised judgment in determining whether indicators of impairment appropriate to the structure of the portfolio should be taken into consideration.

EDF thus takes a 5-year period as the basis for assessment of prolonged decline compared to historical value. This period is at the low end of the range of statistical estimates concerning stock markets. Also, based on statistical observations of the asset/liability management model used for this portfolio, EDF considers impairment of dedicated assets to be significant when the value is 40% or more below the portfolio's historical value.

In parallel to these general criteria for impairment, in the course of operational asset monitoring EDF exercises judgment through its long-term management rules defined and supervised by its governance bodies (maximum investment ratios, volatility analyses and assessment of individual fund manager quality).

#### 48.2.2 RTE shares

By allocating RTE shares to dedicated assets, the Group diversified its dedicated asset portfolio and reduced its volatility, since infrastructure assets such as RTE offer predictable returns that have low correlation with other categories of financial assets such as equities and bonds.

The value of the RTE shares allocated to dedicated assets is €2,393 million at 31 December 2012 (€2,310 million at 31 December 2011). This value is the net consolidated value of 50% of the Group's investment in RTE, presented in investments in associates in the consolidated balance sheet.



## 48.3 Valuation of EDF's dedicated asset portfolio and present cost of the associated long-term nuclear obligations

Dedicated assets are included in the EDF group's consolidated financial statements at the following values:

<i>(in millions of Euros)</i>	Balance sheet presentation	31/12/2012	31/12/2011
Equities		7,328	5,801
Debt instruments and cash portfolio		7,890	7,510
<b>Dedicated assets – equities and debt instruments</b>	Available-for-sale financial assets	<b>15,218</b>	<b>13,311</b>
Currency/equity hedging derivatives	Fair value of hedging derivatives	13	(22)
Other		2	2
<b>Total diversified investments (bonds and equities)</b>		<b>15,233</b>	<b>13,291</b>
RTE (50% of the Group's investment)	Investments in associates	2,393	2,310
<b>TOTAL DEDICATED ASSETS</b>		<b>17,626</b>	<b>15,601</b>

## 48.4 Changes in the dedicated asset portfolio in 2012

Cash allocations to the dedicated asset portfolio were suspended in October 2011 in view of market conditions, but resumed in January 2012. They amounted to €737 million for the year 2012 (€315 million in 2011).

In a context marked by the European sovereign debt crisis, the Group continued its prudent investment policy for these financial instruments in 2012, and as a result its exposure at year-end was carefully controlled for Italy and negligible for the most severely affected Euro-zone countries (Greece, Portugal, Ireland and Spain). The Group also adjusted its position on German government bonds that were considered to offer insufficient returns.

Withdrawals totalling €350 million were made, equivalent to payments made in respect of the long-term nuclear obligations to be covered in 2012 (€378 million in 2011).

The Group's assessment of the value of the dedicated asset portfolio did not lead to recognition of any impairment in 2012.

A total of €260 million in net gains on disposals was recorded in the financial result in 2012 (€76 million in 2011).

The difference between the fair value and acquisition cost of diversified bond and equity investments included in equity is a positive €1,221 million before taxes at 31 December 2012 (€219 million at 31 December 2011).

## 48.5 Present cost of long-term nuclear obligations

The Group's long-term nuclear obligations in France concerned by the regulations for dedicated assets are included in EDF's consolidated financial statements at the following values:

<i>(in millions of Euros)</i>	31/12/2012	31/12/2011
Provisions for long-term radioactive waste management	7,113	6,722
Provisions for nuclear plant decommissioning	12,578	11,366
Provisions for last cores – portion for future long-term radioactive waste management	434	389
<b>PRESENT COST OF LONG-TERM NUCLEAR OBLIGATIONS</b>	<b>20,125</b>	<b>18,477</b>

## ➤ Note 49 Related parties

Details of transactions with related parties are as follows:

	Proportionally consolidated companies		Associates		French State or State-owned entities		Group Total	
(in millions of Euros)	31/12/2012	31/12/2011	31/12/2012	31/12/2011	31/12/2012	31/12/2011	31/12/2012	31/12/2011
Sales	2	5	3,585	3,437	917	880	4,504	4,322
Fuel and energy purchases	45	183	504	666	1,827	1,691	2,376	2,540
Other external purchases	-	-	128	134	1,093	880	1,221	1,014
Financial assets	-	41	-	-	181	262	181	303
Other assets	12	236	1,295	1,242	608	535	1,915	2,013
Financial liabilities	223	136	1,174	1,400	-	1	1,397	1,537
Other liabilities	16	224	734	794	1,212	821	1,962	1,839

The change in proportionally-consolidated companies between 2011 and 2012 principally reflects the takeover of the Edison group on 24 May 2012.

### 49.1 Transactions with entities included in the scope of consolidation

Transactions with RTE (classified as an associate since 31 December 2010) are presented in note 23.1.

Transactions with other joint ventures and associates concern sales and purchases of energy.

### 49.2 Relations with the French State and State-owned entities

#### 49.2.1 Relations with the French State

The French State holds 84.4% of the capital of EDF at 31 December 2012, and is thus entitled in the same way as any majority shareholder to control decisions that require approval by the shareholders.

In accordance with the legislation applicable to all companies having the French State as their majority shareholder, the EDF group is subject to certain inspection procedures, in particular economic and financial inspections by the State, audits by the French Court of Auditors (*Cour des Comptes*) or Parliament, and verifications by the French General Finance Inspectorate (*Inspection Générale des Finances*).

Under an agreement entered into by the French State and the EDF group on 27 July 2001 concerning the monitoring of external investments, procedures exist for prior approval by the French State or notification (advance or otherwise) of the State in respect of certain planned investments, additional investments or disposals by the Group. This agreement also introduced a procedure for monitoring the results of external growth operations.

The public service contract between the French State and EDF was signed on 24 October 2005. This contract is intended to form the framework for public service missions entrusted by the lawmaker to EDF for an unlimited period. The law of 9 August 2004 does not stipulate the duration of the contract.

EDF, like other electricity producers, also participates in the multi-annual generation investment program defined by the minister in charge of energy, which sets objectives for the allocation of generation capacity.

Finally, the French State intervenes through the regulation of electricity and gas markets, particularly for authorization to build and operate generation facilities, establishment of sales tariffs for customers that have stayed on the regulated tariffs, transmission and distribution tariffs, and also determination of the ARENH price in accordance with the NOME law, and the level of the Contribution to the Public Electricity Service (*Contribution au Service Public de l'Électricité* or CSPE).

#### 49.2.2 Relations with GDF SUEZ

Since the distribution network management businesses were transferred to subsidiaries – ERDF, a subsidiary of EDF, has managed electricity distribution since 1 January 2007 and GRDF, a subsidiary of GDF SUEZ, has managed gas distribution since 1 January 2008 – the agreement of 18 April 2005 (amended on 20 December 2007) defining relations between EDF and GDF in respect of the common operator was transferred to the two new companies, and has been executed by them since that date. The common network operator's activities for the distribution sector cover network construction, network operation and maintenance, and metering.

#### 49.2.3 Relations with public sector entities

The Group's relations with public sector entities mainly concern AREVA.

Transactions with AREVA concern uranium purchases, uranium enrichment, nuclear fuel purchases, plant maintenance operations, equipment purchases, and transportation, storage, processing and recycling services for spent fuel.

On 15 December 2008, EDF and AREVA signed an agreement for uranium enrichment services to cover the period 2013-2032.

On 19 December 2008, EDF and AREVA signed a framework agreement for spent fuel management contracts concerning periods after 2007. In execution of this agreement, EDF and AREVA signed two contracts on 12 July 2010 entitled the "EDF-AREVA NC Processing-Recycling agreement" and the "Protocol for recovery and conditioning of EDF waste, and the final shutdown and decommissioning of the AREVA NC plant at La Hague".

EDF and AREVA have signed the following contracts for 1,300 MW nuclear power plants:

- a contract for supply of 32 steam generators and a contract for renewal of the control/command systems in 2011;
- a contract for services related to replacement operations for the first steam generators, in August 2012.

On 31 July 2012 EDF and AREVA Mines also signed two contracts for supplies of natural uranium concentrate, covering the period 2014-2035.

The Group also holds shares in AREVA, as stated in note 36.2.2.2.

## 49.3 Management compensation

The Company's key management and governance personnel are the Chairman of the Board of Directors, the members of the Comex (Executive Committee) throughout the year or since their date of appointment if they joined the Comex during the year, and the members of the Board of Directors appointed by the General Shareholders' Meeting.

The total compensation paid by EDF and controlled companies to the Group's key management and governance personnel amounted to €12.5 million in 2012 (€11.3 million in 2011). This amount covered short-

term benefits (basic salaries, performance-related salary, profit share and benefits in kind), special IEG post-employment benefits where relevant, and the corresponding employer contributions, plus director's fees. The change observed in 2012 is chiefly explained by the fact that certain members of the Comex retired during the year, and their contractual retirement bonuses and performance-related salary were paid in 2012.

Other than the benefits reported above, key management and governance personnel benefit from no other special pension system, starting bonus or severance payment entitlement except by contractual arrangement.

## ➤ Note 50 Environment

### 50.1 Greenhouse gas emission rights

In application of the Kyoto protocol, the EU Directive aiming to reduce greenhouse gas emission levels by attributing emission rights came into effect in 2005, for an initial three-year period which ended on 31 December 2007 and was marked by a reduction in the volumes of rights allocated.

The second allocation period ran from 2008 to 2012.

In the EDF group, the entities subject to this Directive are EDF, EDF Energy, Edison, Fenice, Dalkia International and Dalkia Investissement, Bert, Kogeneracja, Zielona Gora, EC Krakow, ERSa, EC Wybrzeze, EDF Luminus and ESTAG.

In 2012, the Group surrendered 69 million tonnes in respect of emissions generated in 2011. In 2011, the Group surrendered 71 million tonnes in respect of emissions generated in 2010.

The Group's total emission rights allocation for 2012 recorded in the national registers is 72 million tonnes (59 million tonnes for 2011).

The volume of emissions at 31 December 2012 stood at 67 million tonnes. The provision resulting from over-quota emissions amounts to €152 million and covers the shortfall in quotas at 31 December 2012 (€149 million at 31 December 2011).

As part of the Clean Development Mechanism defined in the Kyoto protocol the Group set up a Carbon Fund in late 2006 with the aim of supporting projects to reduce greenhouse gas emissions in emerging countries and benefiting from carbon emission permits. This fund involves EDF and all the European entities, and is managed by EDF Trading.

CER credit purchases through the Carbon Fund amount to €192 million at 31 December 2012 (€192 million at 31 December 2011).

### 50.2 Energy savings certificates

In all its subsidiaries, the Group is engaged in a process to control energy consumption through various measures developed by national legislations, in application of European Union Directives.

The French Law of 13 July 2005, for example, introduced a system of energy savings certificates. Companies selling electricity, gas, heat or cold to end-users with sales above a certain level are subject to energy savings obligations for a three-year period. They fulfill these obligations by making direct or indirect energy savings rewarded by certificates, or by purchasing energy savings certificates. At the end of the three years, the entities concerned must provide evidence of compliance with obligations by surrendering the certificates, or pay a fine to the Treasury.

In the second period, which began on 1 January 2011 and runs until 31 December 2013, the system was extended to new obligated actors (fuel distributors) and applies stricter requirements for obtaining energy savings certificates. EDF is well-placed to meet its obligation thanks to energy-efficient offers for each market segment: residential customers, business customers, local authorities and organizations funding social projects.

EDF's obligation will be calculated retrospectively, based on gas and electricity sales to households and service sector businesses for the period 2010-2012. The volumes of certificates obtained between the two periods will count towards achievement of the obligation for the second period.

### 50.3 Renewable energy certificates

In the United Kingdom, Poland, Belgium and Italy, certificates are awarded when electricity is generated from renewable energy sources, to encourage greater use of renewable energies through a compensation system for generation costs and an obligation for energy suppliers to sell a certain quantity of renewable energy. In practice, the generator or supplier must provide proof that the obligation has been fulfilled or surrender the renewable energy certificates gained and/or purchased. Similar systems have been introduced for cogeneration.

At 31 December 2012, a provision of €430 million was recorded, essentially to cover shortfalls in certificates in the United Kingdom and Belgium.

## ➤ Note 51 Subsequent events

### 51.1 Bond issue with unlimited maturity

On 22 January 2013, EDF launched several tranches of a bond in Euros and sterling with unlimited maturity:

- €1.25 billion at 4.25% coupon for the tranche with a 7-year first call date;
- €1.25 billion at 5.375% coupon for the tranche with a 12-year first call date;
- £1.25 billion at 6% coupon for the tranche with a 13-year first call date.

On 24 January 2013, EDF also launched a US\$ 3 billion bond with unlimited maturity at 5.25% coupon and a 10-year first call date.

These instruments are subordinated to all senior debt, which explains why their coupon is higher than senior bonds. They will be included in equity in the Group's 2013 consolidated financial statements from reception of the funds (29 January 2013).

This is the first time the Group has issued this type of instrument, which it considers a tool for balance sheet optimisation in view of the useful lives of its assets and the long-term investment cycle of its industrial projects.

### 51.2 Decision by Centrica to withdraw from the plan to construct EPRs in the United Kingdom

On 4 February 2013, Centrica announced its decision to end its partnership with EDF for the construction of EPRs in the United Kingdom, by exercising its option to sell EDF Energy its 20% investment in Nuclear New Build Holdings (NNBH), a company formed as a vehicle for "Nuclear New Build" projects in the UK. EDF already owned 80% of NNBH via EDF Energy, and will therefore become the company's sole shareholder.

The exercise price for this option is non-significant for the Group.

EDF is continuing discussions with the British government to agree on a sale price for zero-carbon electricity. Once this price has been set, the Group is confident that the Hinkley Point EPR project will attract considerable interest from investing partners and will go ahead.

Centrica will continue to work with EDF through its 20% interest in existing nuclear facilities in the United Kingdom, and retains its commercial electricity purchase contracts with the Group.

### 51.3 Allocation of the CSPE receivable to dedicated assets for secure financing of long-term nuclear expenses

In application of the decree of 23 February 2007, on 8 February 2013 the French government authorised allocation of CSPE receivable held by EDF to the dedicated assets for secure financing of long-term nuclear expenses.

In view of this authorisation, the positive opinion of the Nuclear Commitments Monitoring Committee and the deliberations of the Board of Directors at its meeting of 13 February 2013, EDF has decided to allocate the total receivable, which represents the accumulated shortfall in CSPE compensation at 31 December 2012 and amounts to €4.9 billion, to dedicated assets. This allocation is concurrent with withdrawals of €2.4 billion of assets from the portfolio (diversified bonds and equity investments, see note 48), such that the net allocation to dedicated assets is €2.5 billion. The objective of reaching 100% coverage of long-term nuclear provisions in advance of the legal June 2016 deadline (set by the "NOME" law) is thus achieved.

The disposal of these financial assets will result in an equivalent reduction in the Group's net indebtedness.

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Consolidated financial statements

## ➤ Note 52 Scope of consolidation

Company	Country	Consolidation method at 31/12/2012	% of ownership at 31/12/2012	% of ownership at 31/12/2011	Business sector
<b>FRANCE</b>					
Électricité de France		Parent company	100.00	100.00	G,D,O
Électricité Réseau Distribution France (ERDF)		FC	100.00	100.00	D
RTE Réseau de Transport d'Électricité		EM	100.00	100.00	T
EDF Production Électrique Insulaire		FC	100.00	100.00	G
<b>UNITED KINGDOM</b>					
EDF Energy Plc (EDF Energy)		FC	100.00	100.00	G, O
EDF Energy (UK) Ltd		FC	100.00	100.00	O
EDF Development Company Ltd		FC	100.00	100.00	O
<b>ITALY</b>					
Edison SpA (Edison)		FC	97.40	48.96	G,D,O
Transalpina di Energia SRL (TdE)		FC	100.00	50.00	O
MNTC Holding SRL		FC	100.00	100.00	O
WGRM Holding 4 SpA		FC	100.00	100.00	O
Fenice Qualita' Per L'Ambiente SpA (Fenice)		FC	100.00	100.00	G,D
<b>OTHER INTERNATIONAL</b>					
EDF International SAS	France	FC	100.00	100.00	O
Energie Steiermark Holding AG (Estag)	Austria	PC	25.00	25.00	G,O
EDF Belgium SA	Belgium	FC	100.00	100.00	G
EDF Luminus SA	Belgium	FC	63.53	63.53	G
Usina Termelétrica Norte Fluminense SA (Ute Norte Fluminense)	Brazil	FC	90.00	90.00	G
Ute Paracambi SA	Brazil	FC	100.00	100.00	G
French Investment Guangxi Laibin Electric Power Co, Ltd	China	FC	100.00	100.00	G
Shandong Zhonghua Power Company, Ltd	China	EM	19.60	19.60	G
Datang Sanmenxia Power Generation Co., Ltd	China	EM	35.00	35.00	G
Taishan Nuclear Power Joint Venture Company, Ltd	China	EM	30.00	30.00	G
EDF Inc.	USA	FC	100.00	100.00	O
Unistar Nuclear Energy LLC	USA	FC	100.00	100.00	G
Constellation Energy Nuclear Group LLC (CENG)	USA	PC	49.99	49.99	G
Budapesti Erömu ZRt (BERT)	Hungary	FC	95.62	95.57	G
EDF DÉMÁSZ ZRt	Hungary	FC	100.00	100.00	G, D, O
Nam Theun 2 Power Company	Laos	EM	40.00	40.00	G
SLOE Centrale Holding BV	Netherlands	PC	50.00	50.00	G
EDF Kraków S.A.	Poland	FC	94.31	94.31	G
EDF Wyrzeze S.A.	Poland	FC	99.77	99.75	G
EDF Polska Cuw	Poland	FC	100.00	75.00	O
EDF Polska Centrala Spolka Z Ograniczona Odpowiedzialnoscia	Poland	FC	100.00	100.00	O
EDF Paliwa Sp. z o.o.	Poland	FC	90.59	-	O
EDF Rybnik S.A. (ERSA)	Poland	FC	97.32	64.85	G
Zec Kogeneracja SA (Kogeneracja)	Poland	FC	48.99	33.40	G, D
Elektrociepłownia Zielona Gora SA (Zielona Gora)	Poland	FC	48.21	32.87	G, D
Stredoslovenska Energetika a.s. (SSE)	Slovakia	PC	49.00	49.00	D
EDF Alpes Investissements SARL	Switzerland	FC	100.00	100.00	O
Alpiq	Switzerland	EM	25.00	25.00	G, D, O, T
Mekong Energy Company Ltd (Meco)	Vietnam	FC	56.25	56.25	G

Consolidation methods: FC = full consolidation, PC = proportional consolidation, EM = equity method.

Business segments: G = Generation, D = Distribution, T = Transmission, O = Other



# Financial information on assets, | 20

## the financial statements and results of the Company

Consolidated financial statements

Company	Country	Consolidation method at 31/12/2012	% of ownership at 31/12/2012	% of ownership at 31/12/2011	Business sector
<b>OTHER ACTIVITIES</b>					
Dalkia Holding	France	EM	34.00	34.00	O
Dalkia International	France	PC	50.00	50.00	O
Dalkia Investissement	France	PC	67.00	67.00	O
EDF Développement Environnement SA	France	FC	100.00	100.00	O
Société pour le Conditionnement des Déchets et Effluents Industriels (SOCODEI)	France	FC	100.00	100.00	O
Cie Financière de Valorisation pour l'Ingénierie (COFIVA)	France	FC	100.00	100.00	O
Société Française d'Ingénierie Électronucléaire et d'Assistance (SOFINEL)	France	FC	55.00	55.00	O
Électricité de Strasbourg	France	FC	88.64	88.82	D
TIRU SA - Traitement Industriel des Résidus Urbains	France	FC	51.00	51.00	O
Dunkerque LNG	France	FC	65.00	65.00	O
EDF Énergies Nouvelles	France	FC	100.00	100.00	G,O
EDF IMMO et filiales immobilières	France	FC	100.00	100.00	O
EDF Optimal Solutions SAS	France	FC	100.00	100.00	O
Société C2	France	FC	100.00	100.00	O
Société C3	France	FC	100.00	100.00	O
EDF Holding SAS	France	FC	100.00	100.00	O
Domofinance SA	France	EM	45.00	45.00	O
CHAM SAS	France	FC	100.00	100.00	O
EDF Trading Limited	UK	FC	100.00	100.00	O
EDF Production UK Ltd	UK	FC	100.00	100.00	O
EDF DIN UK LTD	UK	FC	100.00	100.00	O
Wagram Insurance Company Ltd	Ireland	FC	100.00	100.00	O
Océane Ré	Luxembourg	FC	99.98	99.98	O
EDF Investissements Groupe SA	Belgium	PC	94.80	93.32	O
EDF Gas Deutschland GmbH	Germany	FC	100.00	100.00	O
Friedeburger Speicherbetriebsgesellschaft GmbH (Crystal)	Germany	PC	50.00	50.00	O
Southstream Transport AG	Netherlands	EM	15.00	-	T

Consolidation methods: FC = full consolidation, PC = proportional consolidation, EM = equity method.

Business segments: G = Generation, D = Distribution, T = Transmission, O = Other

At 31 December 2012 the percentage of voting rights, which is decisive for assessing control, differs from the Group's percentage ownership for the following entities:

Company	% of ownership at 31/12/2012	% voting rights at 31/12/2012
Edison SpA	97.40	99.48
EDF Rybnik S.A. (ERSA)	97.32	97.36
Zec Kogeneracja SA (Kogeneracja)	48.99	50.00
Elektrociepłownia Zielona Góra SA (Zielona Góra)	48.21	98.40
EDF Paliwa Sp. z o.o.	90.59	100.00
Dalkia International	50.00	24.14
Dalkia Investissement	67.00	50.00
SOFINEL Société Française d'Ingénierie Électronucléaire et d'Assistance	55.00	54.98
EDF Investissements Groupe SA	94.80	50.00

## 20.2 Statutory Auditors' Report on the consolidated financial statements

*This is a free translation into English of the Statutory Auditors' report on the consolidated financial statements issued in French and is provided solely for the convenience of English speaking readers.*

*This Statutory Auditors' report includes information specifically required by French law in such reports, whether qualified or not. This information is presented below the audit opinion on the consolidated financial statements and includes an explanatory paragraph discussing the auditor's assessments of certain significant accounting and auditing matters. These assessments were considered for the purpose of issuing an audit opinion on the consolidated financial statements taken as a whole and not to provide separate assurance on individual account balances transactions, or disclosures.*

*The report also includes information relating to the specific verification of information given in the Group's management report.*

*This report should be read in conjunction with, and is construed in accordance with, French law and professional auditing standards applicable in France.*

### Year ended 31 December 2012

To the Shareholders,

Following our appointment as Statutory Auditors by your General Meeting, we hereby report to you, for the year ended 31 December 2012 on:

- the audit of the accompanying consolidated financial statements of Électricité de France S.A. ("the Group");
- the justification of our assessments;
- the specific verification required by law.

The consolidated financial statements have been approved by the Board of Directors. Our role is to express an opinion on these consolidated financial statements based on our audit.

### 1. Opinion on the consolidated financial statements

We conducted our audit in accordance with professional standards applicable in France; those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement. An audit includes examining, using sample testing techniques or other selection methods, evidence supporting the amounts and disclosures in the consolidated financial statements. An audit also includes assessing the accounting policies used and significant accounting estimates made, as well as the overall presentation of the consolidated financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

In our opinion, the consolidated financial statements give a true and fair view of the assets and liabilities, and of the financial position of the Group as of 31 December 2012 and of the results of its operations for the year then ended in accordance with IFRS as adopted by the European Union.

Without qualifying our opinion, we draw your attention to the following matters:

- the change in accounting principle described in note 2 on the accounting for actuarial gains and losses related to post-employment benefits;
- the valuation of long-term provisions relating to nuclear electricity production, which results from management's best estimates and assumptions as described in notes 1.3.2.1 and 29 to the consolidated financial statements. This valuation is sensitive to the assumptions made concerning technical processes, costs, inflation rates, long-term discount rates and forecast cash outflows. Changes in these parameters could lead to a material revision of the level of provisioning.

### 2. Justification of assessments

The preparation of the consolidated financial statements requires the use of accounting estimates, which have been made in an uncertain environment, due to the crisis of public finances affecting certain countries of the Euro zone. This crisis is coupled with an economic and liquidity crisis as well as uncertainties related to commodities and power prices, thus resulting in difficulties to determine the economic outlook. In this context, in accordance with the requirements of article L. 823-9 of the French commercial Code, we have made our own assessments which are brought to your attention, in relation to the following matters:

#### Accounting policies

We have verified the appropriateness of the disclosures presented in notes 1.3.27.1 with respect to the accounting treatments of greenhouse gas emission quotas, an area which is not mandatory or specifically addressed in IFRS as adopted in the European Union as of 31 December 2012.

#### Management judgments and estimates

Note 1.3.2 to the consolidated financial statements describes the main sensitive accounting policies for which management makes significant estimates and assumptions and exercises judgment, based on macro-economic assumptions appropriate to the very long-term cycle of Group assets. Particularly, the Group describes in the notes the information related to:

- the obligations regarding the French public distribution of electricity and, particularly, the impact of the changes in estimate related to the useful life of certain assets (notes 1.3.24, 14 and 33);
- the allocation of the cost of the business combination to identifiable assets acquired and liabilities assumed related to Edison in accordance with IFRS 3 revised, and the methodologies and main assumptions being considered for measurement of those assets and liabilities at fair values (note 3.1);

- the methods used to account for the shortfall in the compensation for the Contribution to the Electricity Public Service Costs (*Contribution au Service Public de l'Électricité*) as at 31 December 2012, in view of the agreement reached in January 2013 (notes 4.1, 12.1, 26 and 36.3);
- the impairment charges that have been recognized during the period as well as the main assumptions and indicators of impairment used to test goodwill and long-lived assets (notes 1.3.15 and 13);
- the other provisions and contingent liabilities (notes 32 and 45).

Our procedures consisted in assessing these estimates, the data and assumptions, and as applicable, the legal opinions on which they are based, reviewing, on a test basis, the technical data and calculations performed by the Group, comparing accounting estimates of prior periods with corresponding actual amounts, reviewing the procedures for approving these estimates by management and finally verifying that the notes to the consolidated financial statements provide appropriate disclosures.

### Verification procedures

The procedures we performed in relation to the regulatory framework related to the principle of regulated access to historical nuclear energy (*Accès Régulé à l'Énergie Nucléaire Historique* or ARENH) as established by the NOME Law in France, effective 1 July 2011, are based on the information available from the Group, or released by the Regulatory Energy Commission (*Commission de Régulation de l'Énergie*), and the findings resulting from agreed-upon procedures performed by independent third parties that had access to the underlying transactions.

These assessments were made as part of our audit of the consolidated financial statements taken as a whole and contributed to the opinion we formed which is expressed in the first part of this report.

### 3. Specific verification

As required by law we have also verified, in accordance with professional standards applicable in France, the information relating to the Group, given in the management report.

We have no matters to report as to its fair presentation and its consistency with the consolidated financial statements.

Paris La Défense and Neuilly-sur-Seine, 13 February 2013

#### The Statutory Auditors

#### KPMG Audit Department of KPMG S.A.

Bernard Cattenoz

Jacques-François Lethu

#### Deloitte & Associés

Alain Pons

Patrick E. Suissa

## 20.3 Fees paid by the Group to Statutory Auditors

The following table sets forth the fees related to the 2012 financial year for EDF and its fully consolidated subsidiaries for services by its Statutory Auditors and their respective affiliates:

	Deloitte		KPMG	
	Amount (taxes excluded)	%	Amount (taxes excluded)	%
<i>(In thousands of Euros)</i>				
<b>Audit:</b>				
Statutory audit, certification, review of company and consolidated accounts				
Issuer	3,925	27.6	3,654	30.4
Fully consolidated subsidiaries	6,409	45.0	5,128	42.7
Other tasks and services directly connected to the Statutory Auditor's mission				
Issuer	680	4.8	1,734	14.4
Fully consolidated subsidiaries	180	1.3	166	1.4
<b>Sub-total</b>	<b>11,194</b>	<b>78.7</b>	<b>10,682</b>	<b>88.9</b>
<b>Other services provided by the auditors' networks to fully integrated subsidiaries:</b>				
Legal, tax, social	1,649	11.6	250	2.1
Other	1,382	9.7	1,084	9.0
<b>Sub-total</b>	<b>3,031</b>	<b>21.3</b>	<b>1,334</b>	<b>11.1</b>
<b>TOTAL</b>	<b>14,225</b>	<b>100</b>	<b>12,016</b>	<b>100</b>

### Information given for the 2011 financial year:

The following table sets forth the fees related to the 2011 financial year for EDF and its fully consolidated subsidiaries for services by its Statutory Auditors and their respective affiliates:

	Deloitte		KPMG	
	Amount (taxes excluded)	%	Amount (taxes excluded)	%
<i>(In thousands of Euros)</i>				
<b>Audit:</b>				
Statutory audit, certification, review of company and consolidated accounts				
Issuer	3,407	32.2	3,343	33.3
Fully consolidated subsidiaries	4,006	37.8	4,932	49.1
Other tasks and services directly connected to the Statutory Auditor's mission				
Issuer	377	3.6	1,096	10.9
Fully consolidated subsidiaries	904	8.5	94	0.9
<b>Sub-total</b>	<b>8,694</b>	<b>82.1</b>	<b>9,465</b>	<b>94.2</b>
<b>Other services provided by the auditors' networks to fully integrated subsidiaries:</b>				
Legal, tax, social	815	7.7	254	2.5
Other	1,077	10.2	333	3.3
<b>Sub-total</b>	<b>1,892</b>	<b>17.9</b>	<b>587</b>	<b>5.8</b>
<b>TOTAL</b>	<b>10,586</b>	<b>100</b>	<b>10,052</b>	<b>100</b>

## 20.4 Dividend policy

### 20.4.1 Dividends and interim dividends paid within the last three fiscal years

The amount of dividends and interim dividends paid within the last three fiscal years was as follows:

Financial year	Number of shares	Dividend per share (in Euros)	Total dividends paid <sup>(1)</sup> (in Euros)	Dividend payment date
2009	1,848,866,662	1.15	2,111,146,365.85 <sup>(2)</sup>	3 June 2010
2010	1,848,866,662	1.15	2,122,291,972.68 <sup>(3)</sup>	6 June 2011
2011	1,848,866,662	1.15	2,124,757,978.20 <sup>(4)</sup>	6 June 2012

(1) After deduction of treasury shares.

(2) €1,002,006,770.05 of which paid on 17 December 2009 as an interim dividend 2009 (€937,815,444.36 of which paid in new shares).

(3) €1,053,574,334.82 of which paid on 17 December 2010 as an interim dividend 2010.

(4) €1,053,169,658.76 of which paid on 16 December 2011 as an interim dividend 2011.

On 22 November 2012, the Board of Directors decided, upon authorisation of the Shareholders' Meeting, for the 2012 fiscal year, to pay an interim dividend of €0.57 per share. The total amount of the interim dividend (excluding treasury shares) is €1,052,601,974.10, and was paid on 17 December 2012.

At its meeting of 13 February 2013, the Board of Directors decided to propose to the Shareholders' Meeting of 30 May 2013 the distribution of a dividend to €1.25 per share under the year 2012. Given the interim dividend of €0.57 per share paid on December 2012, a balance of €0.68 per share should be paid.

Subject to approval at the Shareholder's meeting, each shareholder will be offered to opt for a payment in new EDF shares for a portion of €0.10 per share on the 2012 remaining dividend to be paid. Shareholders may exercise their option between 6 June 2013 and 26 June 2013 inclusive. After the 26 June 2013 deadline, the remaining dividend will be paid in cash only. The French State has confirmed to opt for the payment in new shares for the portion of the final dividend payable in shares.

The remained of the dividend to be paid will be paid on 8 July 2013 (the ex-date being 6 June 2013) regardless of the payment being in shares or on cash.

### 20.4.2 Dividend policy, increased dividend

The dividend distribution policy of EDF, determined by its Board of Directors, will take into account its investment needs, the economic context and all other factors considered to be relevant.

The Combined Shareholders' Meeting of 24 May 2011 adopted the amendment to EDF's bylaws to insert a provision for the payment of an increased dividend to shareholders who have held registered shares for at least two years. The number of shares giving entitlement to such increase of 10% may not exceed 0.5% of the share capital per shareholder. The first increased dividend will, in accordance with applicable laws, be distributed after the end of the second financial year following the amendment of the bylaws, namely in 2014 for the dividend to be distributed in respect to the 2013 financial year.

### 20.4.3 Prescription

Dividends that are not claimed within five years of the declared date of payment become time barred and are paid to the French State.

## 20.5 Legal proceedings and arbitration

In the ordinary course of business, the Group is involved in certain legal, arbitration and administrative proceedings. Charges that result from such proceedings are only provided for where such charges are likely and can be either quantified or assessed within a reasonable range. In the latter case, the amount of the provision is calculated on a case-by-case basis, based on the best possible estimate. The amounts of any provisions made depend on the case-by-case risk assessments and do not depend primarily on the status of the proceedings; however, developments in the proceedings may nonetheless lead to a reassessment of such risks.

To the knowledge of the Company, except for the proceedings set out below, there are no other administrative, legal or arbitration proceedings (including pending or threatened proceedings), likely to have or having had in the past 12 months a material impact on the financial situation or the profitability of the Company and/or the Group.

### 20.5.1 Legal proceedings concerning EDF

#### French utilities network (Réseau d'alimentation général – "RAG")

In October 2002, the European Commission initiated proceedings against France, claiming that State aid had been granted to EDF when its balance sheet was restructured on 1 January 1997. By a decision dated 16 December 2003, the European Commission set the principal amount of aid to be repaid at €889 million. On 11 February 2004, the French State issued a collection note for €1,224 million, consisting of the principal amount and interest. This amount was paid by EDF. On 27 April 2004, EDF initiated an action before



the European Union General Court, at the time known as the European Court of First Instance, to annul the European Commission's decision. The European Union General Court issued, on 15 December 2009, a ruling annulling the European Commission's decision of 16 December 2003. As this ruling was binding on the parties, the State repaid €1,224 million to EDF on 30 December 2009. On 26 February 2010, the European Commission filed an appeal against the European Union General Court's ruling before the Court of Justice of the European Union. By order dated 5 June 2012, the Court of Justice rejected the appeal by the European Commission and confirmed the order of the General Court of the European Union of 15 December 2009.

## Asbestos

In the past, EDF has used products containing asbestos. Thus, certain employees, in particular those working in fossil-fired power plant maintenance, may have been exposed to asbestos, principally before such asbestos was replaced or protective measures were implemented by EDF in the late 1970s.

Between 1997 and the end of December 2012, EDF has been party to 587 strict liability (*faute inexcusable*) actions in France in relation to the alleged exposure of its employees to asbestos in their workplace. A finding of liability in such an action could lead to the payment of additional compensation by the employer to victims or their legal successors.

Since June 2004, EDF has decided to no longer appeal, against employees, rulings made by Social Security Case Panels (*Tribunaux des Affaires de Sécurité Sociale* – "TASS") having made findings of liability (*faute inexcusable*) against the employer.

As at the end of December 2012, the cumulative amount of the final judgments against EDF, in relation to litigations relating to the "*faute inexcusable*" of the employer amounted to approximately €24.3 million.

As of 31 December 2012, a financial provision of €30 million was provisioned for in EDF's financial statements for legal proceedings for compensation by asbestos victims.

## Solaire Direct

On 19 May 2008, Solaire Direct filed a complaint and an application for protective measures (*mesures conservatoires*) with France's Competition Council (*Conseil de la concurrence*), alleging that the EDF group had abused its dominant position in the various electricity markets to enter the emerging global services market for shared photovoltaic electricity generation through its subsidiary EDF Énergies Nouvelles Réparties ("EDF ENR"), thereby hindering the entry of new competitors on that market.

The Competition Council met on 26 November 2008 to consider the admissibility of the case on the merits and the application for protective measures. EDF has proposed certain commitments to address concerns over competition expressed by the Competition Council. These commitments were posted on the Council's website as part of a "market test" procedure, in order to allow interested companies to state their opinion.

In 2009, the Competition Authority decided not to pursue the commitment proposal made by EDF and to order protective measures relating to the methods used by EDF ENR to market global photovoltaic energy services, and commenced a proceeding on the merits following a motion by Solaire Direct. At that stage of the proceeding, the Authority considered that the communication methods used by EDF created conflict between, on the one hand, EDF's role as electricity supplier subject to the regulated rates, and on the other hand, the competitive activities of its subsidiary.

In a ruling of 8 April 2009, the French Competition Authority ordered EDF (i) to delete from all communication support for the Bleu Ciel® brand, any reference to EDF ENR's activity in the photovoltaic market (ii) to prevent agents responding to the 39 29 hotline (telephone number for individuals and EDF clients) from making any reference to the services offered by EDF ENR, (iii) to stop communicating information obtained through the 39 29 hotline to EDF ENR – this injunction covers not only the making of appointments

for EDF ENR but also the transmission of information on people interested in the generation of photovoltaic energy – and finally (iv) to refrain from providing EDF ENR with information EDF possesses as a result of its activities as an electricity services provider subject to regulated rates. EDF complied with these orders within the deadlines set by the Competition Authority.

The proceedings on the merits are still ongoing. At the end of the examination on the merits, if the Competition Authority finds that EDF's practices are anti-competitive, it could, notably, levy a fine on EDF in accordance with Article L. 464-2 of the French Commercial Code. The amount of any fines assessed is determined in proportion to the seriousness of the charges made, the significance of the damage made to economy and to the company's situation, up to a maximum of 10% of the global turnover of the company before taxes.

## SUN' R

On 21 June 2012, SUN'R filed a complaint and an application for protective measures (*mesures conservatoires*) with France's Competition Authority, SUN'R accuses ERDF of delays in the procedure for the connection of its photovoltaic facilities and EDF of delays in the implementation of the purchase obligation contracts and the payment of the related invoices. In addition, according to SUN'R, EDF ENR benefited from special treatment for the connection of its facilities by ERDF and the payment of its invoices by EDF. The *inter partes* proceedings were opened on 16 November 2012. The discussions with the Competition Authority regarding the admissibility of the action and the possible granting of protective measures took place on 23 January 2013.

In a decision of 14 February 2013, the Competition Authority issued a decision rejecting all the application for protective measures (*mesures conservatoires*) but the proceedings on the merits are still ongoing. This decision doesn't affect the outcome of the proceedings. If the Competition Authority finds that EDF's practices are anti-competitive, it could, notably, in accordance with Article L. 464-2 of the French Commercial Code. The amount of any fines assessed is determined in proportion to the seriousness of the charges made, the significance of the damage made to economy and to the company's situation, up to a maximum of 10% of the global turnover of the company before taxes.

At the same time, SUN'R filed on 29 August 2012 a petition at an urgent applications hearing for expert assessment and provision before the Administrative Court in Paris including a claim for provisional compensation of €1 million for EDF and €2.5 million for ERDF. By order of 27 November 2012, the urgent applications judge (*juge des référés*) at the Administrative Court in Paris dismissed this petition.

## Labour litigation

EDF is a party to a number of labour lawsuits with employees relating in particular to the calculation and the implementation of rest periods. EDF does not consider that any of these lawsuits, taken individually, is likely to have a significant impact on its financial results or its financial position. However, as these disputes relate to situations that could involve a significant number of EDF's employees in France, if they were to multiply, they could then have a significant negative impact on the Group's financial results.

The Group is also a party to a number of lawsuits with social welfare organisms. The principal dispute is between EDF and Urssaf (the French social security contribution collection agency) in Toulouse and relates to the inclusion of certain bonuses, indemnifications and other benefits in kind in its tax base.

## Environmental litigation

Due to its industrial activities, the Group is a party to various environmental lawsuits, in particular, regarding ground decontamination. As of the date of the filing of this reference document, the Group does not believe that any of these lawsuits, individually, is likely, in the event of an unfavourable outcome, to have a material negative impact on the Group's financial results.

### Tax litigation

During 2008 and 2009, EDF was subject to audits of its accounts for the financial years 2004, 2005 and 2006.

One of the grounds for this adjustment refers to the tax deductibility of the provision for benefits for work-related accidents and sicknesses (*accident du travail et maladies professionnelles* – “AT/MP”) which also concerns RTE, ERDF and Électricité de Strasbourg, since this issue is linked to the nature of Electricity and Gas Industry companies. The Group challenged the position of the tax authorities on the deductibility of such provision. At the end of 2011, the French national commission on direct taxes and turnover taxes rendered a decision in favour of the Company on the main assessment issues that arose from the audits relating to financial years 2004 through 2006 and has in particular confirmed the deductibility of the provision for the AT/MP benefits. In case of unfavourable outcome, the financial risk for the Group in relation to the payment of corporate income tax could amount to €250 million.

At the end of 2011, an assessment letter was sent to the company. A request, including deferment of payment, was sent to the authorities in 2012, with the aim of bringing litigation: no reply had been received by the end of 2012.

A further audit of the accounts for the 2007 and 2008 financial years began in 2010. At the end of 2011, EDF received a proposed adjustment for the 2008 financial year. EDF is contesting most of these tax reassessments, of approximately €900 million, relating to the deductibility of certain long-term liabilities. The authorities confirmed these reassessments in 2012. The Company considers it has good chances to be successful in this litigation and no provision has been accounted to cover these main reassessment claims.

In addition, a reassessment was proposed by the authorities following the audits relating to financial years 2008 and 2009, regarding a non-remunerated advance granted by EDF to its indirect subsidiary Lake Acquisitions Limited for the purposes of the acquisition of British Energy. EDF contests this reassessment claim.

Finally, in the course of the 2012 financial year, a new audit of the accounts was conducted relating to financial years 2009 and 2010. EDF received a proposed adjustment for the 2009 financial year in late 2012, for a non-significant amount. EDF is contesting this proposal.

### Greenpeace

A preliminary investigation was initiated in February 2009 before the Nanterre Criminal Court in relation to a “concealment of invasion of an automated data processing system” (*complicité et recel d'atteinte à un système de traitement automatisé de données*) after a computer expert from a non-Group company stated that he had hacked into the computer used by former Greenpeace spokesman in 2006, Mr. Yannick Jadot, at the request of an EDF employee. Said employee and his supervisor were formally placed under investigation (*mis en examen*) on 24 March and 10 June 2009 respectively, and have been subject to disciplinary transfers. EDF was placed under investigation on 26 August 2009. By judgment delivered on 10 November 2011, EDF and the two employees were sentenced by the court in Nanterre.

By order delivered on 6 February 2013, the Court of Appeal in Versailles cleared EDF and the supervisor of the allegations. In terms of the other employee, the Court of Appeal confirmed the judgment of guilt and sentenced him to 6 months in prison. In civil proceedings, the employee was also sentenced to pay damages to Greenpeace and Mr. Yannick Jadot for the non-pecuniary damage suffered. The employee, Greenpeace and Mr. Yannick Jadot appealed to the Court of Cassation.

### Fessenheim

On 25 July 2008, an association and individuals petitioned the French Ministers in charge of nuclear safety (the Ministers for Energy and Ecology) to order the permanent shutdown and dismantling of the Fessenheim nuclear power plant. The petitioners based their request on Article 34 of French law n° 2006-686 of 13 June 2006 relating to transparency and safety in nuclear matters, which allows the enactment of a decree adopted in the French Council of State, after consultation with the French Nuclear Safety Authority (*Autorité de Sûreté Nucléaire* – ASN), to order the final shutdown and dismantling of a basic nuclear installation that presents serious risks, when no other course of action is possible.

After the dismissal of the petition by the Ministers, the petitioners filed an appeal with the Strasbourg Administrative Tribunal on 10 December 2008, which was dismissed in the judgment of 9 March 2011. The petitioners lodged an appeal on 4 May 2011. EDF and the French State both submitted statements for the defence in 2012. The trial is still ongoing.

The same petitioners filed an application for review on 18 April 2011, requesting the Ministers in charge of nuclear safety and ASN suspend the operation of the Fessenheim power plant. The petitioners base their request on Articles 34 and 35 of the decree of 2 November 2007 relating to basic nuclear facilities and to the monitoring of nuclear safety and security for the transportation of radioactive substances, which enables Ministers or the ASN to suspend the operation of a basic nuclear facilities in case of serious risk. After the refusal of the Ministers and the ASN to adhere to their request, the petitioners respectively initiated actions with the Administrative Court in Strasbourg (for the Ministers’ implied refusal) and French Council of State (for ASN’s implied refusal).

By order of 9 March 2012, the President of the Administrative Court in Strasbourg referred to the Council of State the requests regarding the Ministers’ implied refusal. The ASN and EDF respectively submitted their statements for the defence in June 2012.

Finally, by an application for interim measures dated 23 March 2013, several associations including *Réseau Sortir du Nucléaire* required the suspension of the works related to the safety review and including the strengthening of the slab.

### European Commission investigation concerning an increase in prices on the wholesale electricity market

The European Commission carried out in March 2009 surprise inspections on various EDF premises, in the context of an investigation relating to the changing of prices on the wholesale electricity market in France.

The European Commission closed this case in September 2012.

### Verdesis

In June 2008, Euro Power Technology filed a complaint and an application for protective measures with the French Competition Council against EDF and its subsidiary, Verdesis, concerning the biofuel activities of both companies. By decision of 16 April 2010, the Competition Authority dismissed Europe Power Technology’s complaint.

On 26 April 2010, Euro Power Technology lodged an appeal against this decision before the Court of Appeal in Paris, which dismissed its appeal by order of 2 December 2010. Euro Power Technology lodged a further appeal with the Court of Cassation (*Cour de Cassation*) on 28 December 2010. By order of 9 October 2012, the Court of Cassation dismissed Europe Power Technology’s appeal against the order by the Court of Appeal in Paris delivered on 2 December 2010. This order therefore ended this litigation by rendering final the decision taken by the Competition Authority on 16 April 2010, dismissing Euro Power Technology’s claim.

## Photovoltaic producers litigation

The announcement by the public authorities in autumn 2009 of an upcoming decrease in the photovoltaic electricity purchase prices set by the order of 10 July 2006, triggered a massive increase in requests for purchase contracts, likely to generate a very significant increase in costs to be compensated by the CSPE (*Contribution au service public de l'électricité* – Contribution to the Public Electricity Service). Several successive ministerial orders were issued along the lines of this announcement in order to modify both the purchase prices for electricity generated via photovoltaic energy and the terms and conditions for their application. By decree of 9 December 2010, the government also provisionally suspended the obligation to purchase photovoltaic electricity for a period of 3 months. An order of 4 March 2011 set the new terms of purchase applicable following the end of this moratorium. In this context, a certain number of producers brought legal proceedings and began litigation with the aim of being able to benefit from the most favourable price resulting from the previous order of 10 July 2006 or to be exempted from the suspension.

In addition, in Corsica and in the French overseas departments where EDF also operates as a network manager, some producers brought action for compensation with the aim of obtaining compensation for the loss in earnings they consider that they incurred as a result of delays in the connection procedures, which caused them to be affected by the suspension of the purchase obligation.

## Radioactive waste packaging and interim storage facility (ICEDA)

A decree of 23 April 2010 authorised EDF to set up a regulated nuclear facility, known as a "radioactive waste processing and interim storage facility" in the city of Saint-Vulbas, in the Ain département. Two petitions for cancellation of the decree were filed with the French Council of State in June 2010, one by Roozen, a horticultural company operating near the site, and the other by a group of environmental protection associations. As of the date of the filing of this reference document, the investigation is still pending with the French Council of State. A third petition was filed on April 2012 by the city of Geneva with the Council of State, also requesting the cancellation of the decree.

Roozen had also filed a petition on 21 April 2010 seeking cancellation of the building permit. In a judgment dated 13 December 2011, the Administrative Court in Lyon cancelled the building permit for violation of the city's local zoning plan. EDF lodged an appeal with the Administrative Court of Appeal in Lyon. Following confirmation of this decision by the Administrative Court of Appeal in Lyon on 19 June 2012, EDF lodged, in August 2012, a further appeal with the French Council State.

In addition, the town of Saint-Vulbas consulted with stakeholders and reviewed its zoning plan and EDF prepared a new building permit request.

Roozen requested an emergency injunction to suspend the local zoning plan. The urgent applications judge at the Administrative Court in Lyon, by order of 14 January 2013, dismissed this request on grounds of lack of urgency.

## Flamanville

On 15 November 2006, EDF filed an application with the ASN to authorise the retention and disposal of liquid and gaseous effluents from the nuclear plant in Flamanville (Manche). This request included the retention and disposal of the two existing reactors on the site (Flamanville 1 and Flamanville 2), as well as those of the future EPR reactor (Flamanville 3) currently under construction.

The ASN decided, on 7 July 2010, to limit EDF disposals in the environment of the liquid and gaseous effluents for the operation of the 3 reactors. This decision was validated by an order of the Ministers in charge of nuclear safety on 15 September 2010.

A local association, CRILAN, initiated proceedings with the Administrative Court in Caen on 23 March 2011 to have this order cancelled.

By order of 20 July 2012, the President of the Administrative Court in Caen referred the case to the French Council of State. The Court deemed that CRILAN's request did not relate to the ministerial approval order but rather to the decision by the ASN of 7 July 2012. However, under the terms of Article R. 351-2 of the French Administrative Justice Code, the French Council of State has jurisdiction over appeals against decisions by ASN. EDF and the French State must file their statements for the defence by June 2013.

## Brennilis

After EDF obtained authorisation, by order of 27 July 2011, to partially dismantle the Brennilis nuclear facility, a storage facility for the Monts-d'Arrée nuclear plant, several associations brought an action against this order before the French Council of State on 28 September 2011, followed by the filing of an additional statement filed on 28 December 2011. In addition, on 16 January 2013, the same associations filed an emergency motion before the Council of State requesting the immediate suspension of the implementation of the decree. By order dated 6 February 2013, the French Council of State rejected the application for suspension and in a decision dated 1st March 2013, dismissed the application for the cancellation of the decree.

## Arbitration following the termination of a gas supply contract

On 2 August 2012, EDF received a demand for arbitration filed with the International Chamber of Commerce by one of its gas suppliers. This supplier is contesting the termination by EDF of a 4-year natural gas supply contract which had one year left to run, and is claiming one hundred million euros in compensation. EDF considers that the conditions required for it to terminate the contract had been met and therefore deems unfounded the amount claimed by the plaintiff. The court of arbitration, meeting in January 2013, shall reach a decision in the course of the second half of 2014.

## 20.5.2 Legal proceedings concerning EDF's subsidiaries

### RTE

#### Sale of high voltage electricity transmission by SNCF

The French law of 9 August 2004 on the public electricity and gas service and electricity and gas companies had also set out that SNCF's high voltage electricity transmission network facilities should be sold to RTE. On 9 July 2009 a specially-formed commission issued its decision on the transfer value of the network, estimating it at €140 million. SNCF filed an appeal against this decision with the French Council of State on 20 August 2009, considering the transfer value of the facilities to be much higher. Until the French Council of State rules on the appeal, SNCF has transferred its electricity facilities to RTE and the sale was agreed on 26 May 2010 for an amount of €140 million, of which only €80 million have been paid by RTE as down-payment.

#### Tax litigation

In 2008 and 2009, RTE was subject to an audit of its accounts for financial years 2005, 2006 and 2007. At the end of 2011, an assessment letter was sent to EDF. The reassessment claim relating to the deductibility of the provision for the benefits for occupational accidents and diseases remains contested by the Group. At the end of 2012, RTE referred the matter to the Administrative Court in Montreuil in order to confirm the deductibility of the provision.

In addition, during 2010 and 2011, RTE was subject to an accounts audit relating to the 2008 and 2009 financial years. The main reassessment claim relates to the occupational accidents and sicknesses litigation contested by the Group, whose reassessment was confirmed by the authorities in 2012.



## ERDF

### Tax litigation

EDF received at the end of 2009 a proposed adjustment related to an accounts audit for the 2004, 2005 and 2006 financial years. The reassessment claim relating to the deductibility of the provision for the benefits for occupational accidents and sicknesses remains contested by the Group.

### Direct Énergie

Article 23 of the law of 10 February 2000 allows suppliers to offer their customers a single contract for both supply and network access, and enter into a contract known as a GRD-F contract with the network operator for access to the network in order to perform such supply contracts. The current wording of the GRD-F contract provides that in the event of a payment default of the final customer, the supplier must pay ERDF the price corresponding to delivery through the network. Direct Énergie challenged this provision through a petition to the *Comité de règlement des différends et des sanctions* ("CoRDIS") of the French Energy Regulation Commission (*Commission de régulation de l'énergie* – CRE) filed on 20 July 2010. In a decision of 22 October 2010 notified to ERDF on 17 November 2010, CoRDIS ruled that no provision in the current legislation authorised ERDF to force the supplier to bear the risk of non-payment of the share due to the distributor, and that the supplier must have recovered the amounts due for network use from the final customer before paying them to the network operator. CoRDIS therefore requested that ERDF send to Direct Énergie a new GRD-F contract in compliance with this decision.

Following the action brought by ERDF, the Court of Appeal in Paris delivered a judgment on 29 September 2011 confirming CoRDIS's decision. In order to comply with the principle of non-discrimination, discussions were held between suppliers and ERDF in 2011 under CRE's supervision in order to modify the GRD-F contract, taking account of the decision by CoRDIS confirmed on appeal. At the public hearing of CoRDIS on 17 December 2012, ERDF submitted, in accordance with CoRDIS's decision of 22 October 2010, a plan in which the network manager assumes its share of the financial risk resulting from non-payment by the end customer. CoRDIS's decision, recognising that its decision of 22 October 2010 had been implemented, was published in the Official Journal of 19 March 2013.

At the same time, Direct Énergie and Poweo had brought action against ERDF before the Commercial Court in Paris, respectively on 11 December 2009 and 3 March 2011. Both companies requested that ERDF retroactively bear the expense of the unpaid invoices they had recorded since 2004 as well as the annulment of the GRD-F contract and, alternatively, its reclassification as a mandate contract. ERDF, Poweo and Direct Énergie ended this litigation.

### Photovoltaic producers litigation

Photovoltaic installations benefit from EDF's (or Non-Nationalised Distributors') obligation to purchase the electricity they produce, the terms and conditions of this obligation to purchase being set in regulations, to date in an agreeable regulatory framework. This scheme, which made possible the development of the photovoltaic industry in France, has led to what is considered as the excessively-rapid growth of this industry, with the result that the government, after several orders decreasing repurchase prices (orders of 12 January, 16 March and 31 August 2010), decided, by moratorium decree of 9 December 2010, to suspend the signing of new contracts for a period of three months and indicated that the applications which had not been accepted before 2 December 2010 should go through the process again to request the connection, based on a new order setting the photovoltaic electricity repurchase price. This order, issued on 4 March 2011, generated a significant decrease in the repurchase price of photovoltaic electricity.

The perspective of these various price changes, anticipated by the photovoltaic industry, led, particularly in August 2010, to a large number of submissions to request connections in ERDF's units. In spite of significant measures implemented to process all these applications, ERDF has still not been able to deliver the technical and financial offers within a time period enabling producers to benefit from the prices applicable prior to the 4 March 2011 order.

The order issued by the French Council of State on 16 November 2011 dismissing the various claims brought against the moratorium decree of December 2010 generated a significant number of claims against ERDF in November and December 2011, which continued throughout the whole of 2012, though at a lower rate. These claims were mainly brought by producers who had to abandon their projects because the operational conditions were less favourable than before with the new electricity repurchase prices. These producers consider ERDF responsible for this situation as they claim that ERDF did not deliver the technical and financial offers for connection on time for them to benefit from more advantageous electricity repurchase conditions. EDF considers that it cannot be held liable and particularly lodged an appeal against the few judgments delivered that were not in favour of EDF at *nisi prius* in 2011 and 2012.

### Claim against the TURPE 3 price decision

By order of 28 November 2012, the French Council of State pronounced the cancellation of the TURPE 3 price decision of 5 May and 5 June 2009, which set the prices for the use of the distribution network.

The grounds for cancellation were the method used to determine the "average weighted capital cost" (AWCC): the Council of State deemed this method "legally incorrect", on the grounds that it does not take into account "the specific accounts of concessions, which correspond to the rights of concessionaires to recover free of charge the assets belonging to the concession at the end of the contract (...) as well as the provisions for the renewal of long-term assets".

This cancellation shall take effect on 1 June 2013. In the meantime, it is down to the CRE to propose, then the Ministers for the Economy and Energy to approve, the new distribution prices, taking account of the decision by the French Council of State, which shall retroactively replace the cancelled prices. The new price decision is currently being prepared.

## EDEV

EDEV's tax audit relating to the 2002 and 2003 financial years led to the proposal of an additional corporate income tax assessment of €14.5 million. The Administrative Court of Appeal, by order of 6 April 2012, which was not in favour of EDF, definitively resolved the persistent disagreement on the proposed corrections.

## EDF International

EDF International's tax audit relating to the 2008 and 2009 financial years led to a correction proposal being issued in late 2011. Two main reassessment claims, amounting to an approximate total of €135 million, relate firstly to the loss of value recorded at the end of 2009 and deducted from EDF International's income following the contribution of the CEG shares to its American subsidiary, EDF Inc., and secondly the valuation of the convertible bond created for the refinancing of the acquisition of British Energy. In 2012, EDF International contested these reassessment claims, for which it considers it has good chances to be successful in this litigation. In late 2012, EDF International sought to reach an amicable settlement in both France and the US regarding the valuation of the CEG shares recorded at the time of the contribution, based on the tax agreement to prevent double taxation in both France and the US.

## EDF Énergies Nouvelles

### Silpro

Silpro (Silicium de Provence) went into court-ordered liquidation on 4 August 2009. EDF ENR group held a 30% minority shareholding in this company along with the main shareholder, the German company Sol Holding. On 30 May 2011, the liquidator brought action against the shareholders and executives of Silpro, with joint and several liability, to make up for the shortfall in assets resulting from Silpro's liquidation, amounting to €101 million.

### SOCODEI

The low-activity waste processing and packaging centre (CENTRACO) operated by SOCODEI, a subsidiary fully owned by EDF, is used to process weakly radioactive waste either by smelting or by incineration. On 12 September 2011, the explosion of a waste smelter caused a fire, killing one and injuring four. The accident did not cause any chemical or radioactive discharge. The ASN closed the investigation on this INES level-1 accident and decided, on 27 September 2011, to only permit the smelters and incinerators stopped shortly after the accident to be re-started with prior authorisation. On 29 June 2012, ASN authorised SOCODEI to restart the incinerator subject to prior filing with ASN of the full report on the checking operations relating to the compliance of the facilities necessary for the furnace to be safe. The smelting unit, in which the accident occurred, is still shut down.

Following the accident, several investigations were opened. On 16 September 2011, the Public Prosecutor's Department in Nîmes opened an inquiry against X for homicide and involuntary injuries and the inquiry is ongoing. The results of the investigations by the Labour Inspectorate and ASN were sent to the Public Prosecutor's Department and a court expert was appointed. Once the court-ordered expert assessment operations had been completed, the examining magistrate authorised the removal of the seals on the smelter.

## Edison

### Legal action initiated by ACEA SpA concerning Edison's shareholding in Edipower

In May 2006, ACEA SpA ("ACEA"), Rome's municipal utility, addressed a complaint to the Italian government and to Italian regulatory (AEEG) and competition (AGCM) authorities, alleging that the joint takeover of Edison by EDF and A2A S.A. (formerly AEM S.p.A) had crossed the threshold of 30% of the share capital of Edipower held by State corporations (limit set forth by a decree of the President of the Italian Council of Ministers, dated 8 November 2000 defining the rules applicable to the privatisation of companies (called Gencos) then held by Enel SpA).

On 7 July 2006, the AGCM rendered an opinion (*segnalazione*) supporting ACEA's position and officially requiring the Italian government and parliament to take measures to comply with the provisions of the 8 November 2000 decree.

In August 2006, ACEA initiated an action against EDF, IEB and WGRMH Holding 4 (along with Edison, A2A S.A., Delmi, Edipower, AEM Turin, Atel and TdE) before the Civil Court in Rome.

According to ACEA, crossing this threshold is a violation of the applicable laws and constitutes an act of unfair competition which could adversely affect the competition on the energy market and consumers' interests.

ACEA therefore asked the court to acknowledge the unfair behaviour of EDF and A2A S.A, and force EDF and A2A S.A. to sell their stakes in order

to remain under the 30% limit and prohibit them from taking and using energy in excess of the 30% threshold, and, finally, to compensate ACEA for the prejudice suffered that it has not been able to precisely evaluate at this stage, the valuation being subject to a distinct hearing.

ACEA also indicated that it would request the court to take protective measures to protect its interests until the court rules on the merits.

In January 2007, Endesa Italia joined ACEA in its legal action.

The judge has rejected the addition to the file of a note from ACEA (new evidence) which assessed the prejudice that ACEA would suffer at €800 million.

The hearing on the merits of the case and on the grounds on which ACEA based itself to assess its prejudice, was initially set for 26 June 2008, and was postponed several times until 24 March 2011. As EDF and its subsidiaries refused the *inter partes* proceeding requested by ACEA for the assessment of its prejudice, any potential decision by an Italian judge in favour of this assessment should not be binding upon EDF.

In December 2010, Endesa Italia, now named E.ON Italia, and EDF signed a settlement agreement in which E.ON Italia undertakes to drop the case and all other claims against EDF in connection with EDF's indirect investment in Edipower. The judge has acknowledged this agreement in an order dated 19 May 2011, by which the case was postponed to 13 March 2013. The decision is expected on May 2013.

### Proceeding concerning the sale of Ausimont (Bussi)

Further to a preliminary investigation initiated by the Public Prosecutor of Pescara (Abruzzo region) in relation to a suspected case of water pollution and ecological disaster affecting the river Aterno basin at Bussi sul Tirino, which for more than a century has been the site of an industrial complex belonging to Ausimont SpA that was sold to Solvay Solexis SpA in 2002, the Public Prosecutor of Pescara notified certain former Directors and managers of Solvay Solexis and Edison that the case would go to court on charges of water poisoning, ecological disaster and fraud to the prejudice of the site's purchaser, Solvay Solexis.

On 15 December 2009, the proceedings against Montedison (now Edison) for fraud were abandoned, whereas the proceedings on the matters of environmental disaster and poisoning continued. By an order of 10 May 2011, the judge heading the preliminary investigations reclassified the poisoning charges as "water alteration", for which the maximum penalties and damages which could be ordered by the judge would be lesser.

Subsequently, the referral order was cancelled by the court, which ordered that the case be referred to the Public Prosecutor for a new referral order, as well as the summoning of a new preliminary hearing. This preliminary hearing, which began on 4 October 2012, is ongoing.

In this context, a large quantity of industrial waste was found on a plot of land belonging to Edison adjacent to the plant, and an attachment order has been placed on that land, and the President of the Italian Council of Ministers appointed on 4 October 2007 a deputy special commissioner empowered to undertake urgent measures: identification, safety and rehabilitation measures for the land. The commissioner has ordered Edison to prepare a survey of the zone, take urgent measures to make it safe and present proposals for decontamination of the ground and ground water. Edison, which has never used this site for its business, filed an appeal with the Regional Administrative Court in June 2008. The Regional Administrative Court rejected this appeal in March 2011 and Edison challenged this judgment before the French Council of State.



### Action by the Public Prosecutor of Alessandria

In 2009, the Public Prosecutor of Alessandria (Italy) sent certain managers and former Directors of Ausimont Spa (now named Solvay Solexis SpA, a company sold by Montedison to the Solvay group in 2002) notification of the conclusion of investigations related to the possible poisoning of water from the spring on the industrial site of Spinetta Marengo and surrounding sites, and the lack of any action for site rehabilitation. The investigation was closed on 16 January 2012.

The judge entertaining jurisdiction decided, on 16 January 2012, to bring action before the assize court in Alessandria against a number of former Montedison executives for behaviour that could constitute environmental and public safety offences.

The trial before the assize court began on 17 October 2012 and is currently in the preliminary hearing stage.

In addition, an administrative decision ordered Solvay Solexis to rehabilitate the Spinetta Marengo site. Edison voluntarily intervened in the proceeding to defend its interests in relation with the claim filed by Solvay Solexis for the cancellation of this administrative decision, notably because the administrative decision doesn't impose any obligation on Edison to rehabilitate the site (this obligation is imposed exclusively on Solvay Solexis).

### Carlo Tassara

The company Carlo Tassara, Edison's main minority shareholder, brought legal proceedings on 12 July 2012 before the Regional Administrative Court in Latium (Rome) requesting on the merits an increase in the price of the mandatory takeover bid launched by the EDF subsidiary Transalpina di Energia (TDE), following the takeover of Edison on 24 May 2012. The parties against which the plaintiff brought these proceedings are CONSOB, the Italian financial market authority, EDF, as well as its Italian subsidiaries (MNTC, WGRM4 and TDE), Edison, Delmi and A2A. The date of the hearing before the Court has not yet been scheduled. Any decision may be appealed before the Italian Council of State.

At the same time, the plaintiff filed with CONSOB in May 2012 a request to increase the price of the mandatory takeover bid based on practically identical arguments to those filed for the proceedings on merits before the Administrative Court. CONSOB dismissed this request on 25 July 2012. The plaintiff did not appeal against this decision.

### Claims brought by employees concerning exposure to asbestos or other harmful chemical substances

Over the last years, Edison has faced a significant increase in the number of claims for damages arising from the death or illness of employees that were allegedly caused by exposure to several forms of asbestos at factories owned by Montedison, or other judicial cases assumed by Edison as a result of corporate acquisitions.

Furthermore, Edison is involved in several criminal proceedings filed by former employees of companies belonging to the Edison group or their legal successors, arising from exposure to harmful chemical substances emitted by Montedison's facilities (since transferred to Enimont which became Enichem, a subsidiary of ENI).

### Environmental litigation

Edison is involved in several criminal proceedings currently underway concerning damages caused by the operation of Montedison's chemical factories (petrochemical facilities in Porto Marghera, Crotone, Mantua and Cesano Maderno) prior to their sale to Enimont. These criminal proceedings also include actions brought by third parties concerning personal injuries related to the alleged environmental damage.

### BE ZRt

Following a formal investigation based on European regulations on State aid, the European Commission issued a decision on 4 June 2008, requiring the Hungarian government to terminate the long-term electrical energy purchase agreements ("PPAs") existing at the end of 2008 and that the electricity producers refund by April 2009 any amounts of State aid received since 1 May 2004, the date on which Hungary joined the European Union. BE ZRt lodged an appeal against this decision before the European General Court ("EGC") on 4 May 2009.

The Hungarian Government did not challenge the European Commission's decision, and the Hungarian legislature enacted a law on 10 November 2008 terminating all PPAs on 31 December 2008 without compensation. In late April 2010 the European Commission and the Hungarian government accepted the principle of netting stranded costs with the State aid paid. As a result BE ZRt will have no illegal State aid to repay.

By order of 13 February 2012, the EGC dismissed the action for cancellation filed by BE ZRt against the decision. However, even if this decision by the EGC appears highly contestable, insofar as BE ZRt is no longer liable to be required to refund this State aid, and due to the absence of direct impact on the ongoing arbitration (see below), BE ZRt did not appeal against this decision.

In order to pursue its business after the termination of its PPAs, BE ZRt negotiated an 8-year sales contract with MVM, the sole Hungarian buyer owned by the Hungarian State, for half of its electricity output, and benefited from the "Cogen 1 decree"<sup>1</sup> for the sale of the other half of its output, for a period due to run until 2013. However, Hungary adopted on 16 March 2011 an amendment to the law on electricity ending any support to cogeneration in Hungary as from July 2011.

EDF International, whose investment in BE ZRt was undertaken after the company's privatisation on specific terms that are now in question, notified the Hungarian State, on 12 May 2009 of an arbitration on the basis of the Energy Charter Treaty (ECT), in accordance with UNCITRAL rules. The arbitration proceedings were suspended until 1 October 2011, further to several successive agreements, and have now resumed. EDF International filed on 30 December 2011, with the permanent arbitration court of The Hague, a statement in reply in order to obtain compensation for the loss of the PPAs. The prejudice with respect to heating prices in 2011 was introduced in this statement for protective purposes. On 2 November 2012, Hungary filed its statements for the defence, both on the merits and in order to contest the Court's jurisdiction. The European Commission shall file its statement, if applicable, before 14 May 2013 and EDF International will have until 24 June 2013 to file its statement in reply. The final hearing is scheduled between 2 and 13 December 2013.

1. Decree defining the terms and conditions, including prices, for renewable energy and cogeneration adopted by the Hungarian government on 28 November 2008, known as the "Cogen" decree.

# 20 | Financial information on assets, the financial statements and results of the Company

Significant change in the Company's financial or trading position

## EnBW

In February 2012, EDF International received an arbitration request filed with the International Chamber of Commerce by the German company Neckarpri GmbH, acquisition vehicle of the Bade-Wurtemberg State within the scope of the transfer by the EDF group of its shareholding in EnBW, signed on 6 December 2010 and finalised on 17 February 2011.

Neckarpri claims that the level of the price paid for the acquisition of the EDF group's shareholding in EnBW was excessive and thus constituted illegal State aid. On this basis, Neckarpri is mainly seeking the reimbursement of the amount allegedly paid in excess. This amount, initially estimated at €2 billion in the demand for arbitration, was re-estimated in July 2012 in an expert report ordered by Bade-Wurtemberg State at €834 million. In September 2012, Neckarpri confirmed the reduction of its main claim to

this amount. Alternatively, Neckarpri requests the cancellation of the sale of the EDF group's shareholding in EnBW.

The arbitration proceedings are ongoing. EDF considers this request unfounded and unjustified and intends to claim damages for the losses of all kinds incurred as a result of these proceedings.

### 20.5.3 Litigation having arisen after the closing of the 2012 financial year

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None.

## 20.6 Significant change in the Company's financial or trading position

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The significant events that took place between the end of the 2012 fiscal year and the date of filing of this reference document are mentioned in note 51 to the consolidated financial statements for the fiscal year ended 31 December 2012 as to events that took place before the financial statements

were drawn up by the Board of Directors on 13 February 2013, and, for events occurring after 13 February 2013, in section 12.1 ("Subsequent events") of this reference document.





# 21 Additional information

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## 21.1 General information regarding the Company's capital

### 21.1.1 Share capital amount

On the filing date of this reference document, the details of the Company's share capital are as follows:

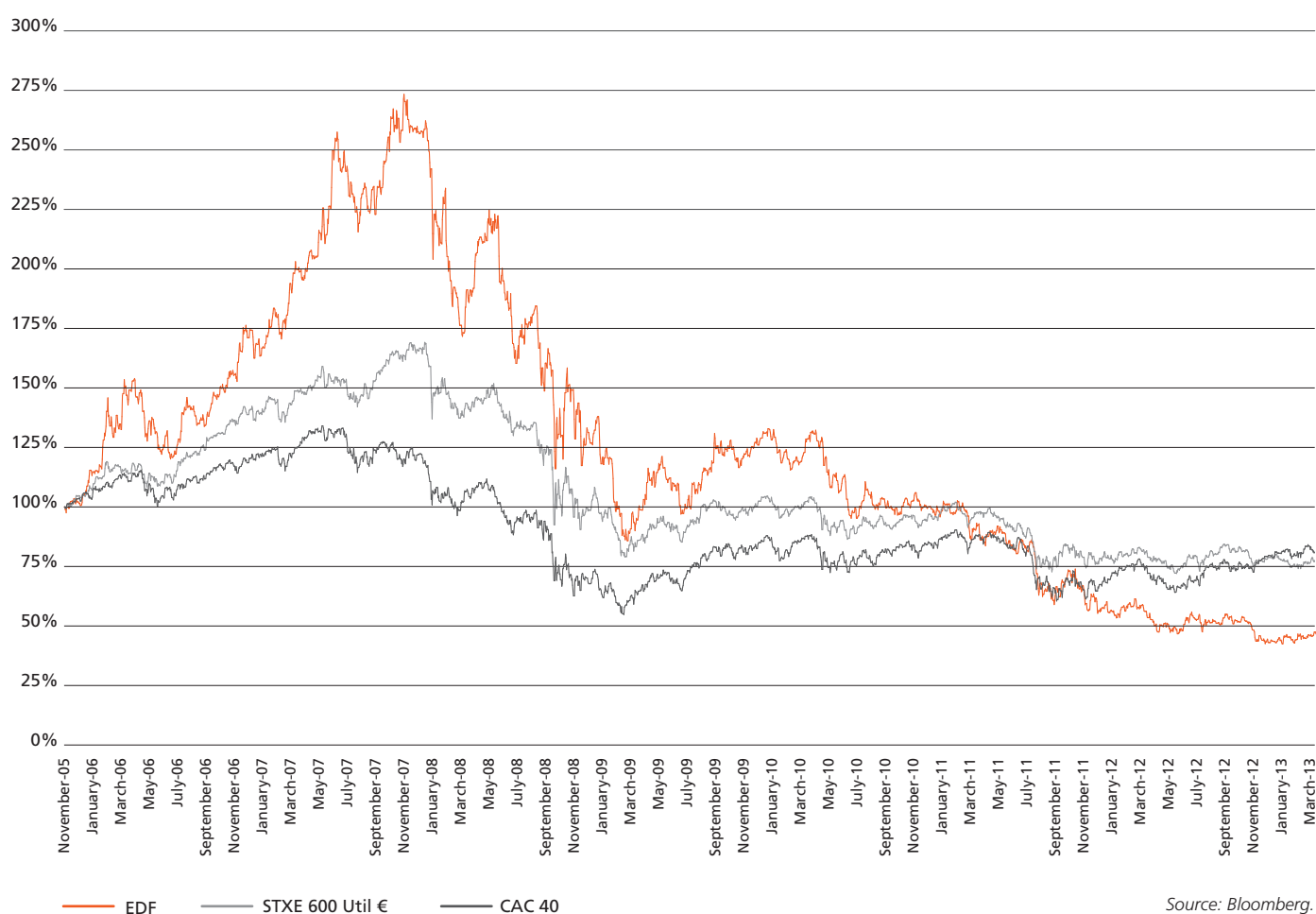
Number of shares issued	1,848,866,662
Par value	€0.50 per share
Type of shares issued	common shares
Share capital amount	€924,433,331

The share capital issued by the Company has been paid up in full. The Company has not issued or authorised any preference shares.

### 21.1.2 Market for the Company's shares

The Company's shares have been listed for trading by Euronext Paris (Compartment A) since 21 November 2005, under ISIN code FR 0010242511, Reuters code (EDF.PA) and Bloomberg code (EDF:FP).

The following graph shows the changes in the Company's share price between 21 November 2005 and 28 March 2013:



Source: Bloomberg.

The following table shows the share price and volume of EDF shares traded between 1 January 2012 and 28 March 2013 on the Euronext Paris stock market:

	Transaction		Closing price (in euros)	
	(in millions of shares)	(in millions of euros) <sup>(1)</sup>	High	Low
<b>2012</b>				
January 2012	36.75	652.43	19.24	17.075
February 2012	31.35	579.78	19.075	17.98
March 2012	33.12	607.00	19.60	17.11
April 2012	60.75	985.86	17.685	15.20
May 2012	49.42	779.62	16.415	15.165
June 2012	56.97	915.61	17.255	14.975
July 2012	45.48	758.49	17.875	15.235
August 2012	29.57	488.01	16.885	16.125
September 2012	31.19	527.57	17.615	16.255
October 2012	24.51	410.11	17.27	16.325
November 2012	43.86	644.09	16.56	13.98
December 2012	35.63	498.29	14.295	13.66
<b>2013</b>				
January 2013	41.38	593.86	14.88	13.66
February 2013	41.14	594.74	14.95	13.73
March 2013	34.29	509.43	15.305	14.34

(1) The trades expressed in millions of euros correspond to the monthly sum of the daily number of securities traded, multiplied by the market closing price on the same day (Source: Euronext).

## 2012

In 2012, EDF's share price fell by 25.6%. The French CAC 40 index increased by 15.2%, while the Euro Stoxx Utility sector index lost 0.7%.

At 31 December 2012, the closing price of the EDF share was €13.98 (compared to €18.80 at 31 December 2011). Its lowest closing price in 2012 was €13.66 on 6 December, and its highest closing price was €19.60 on 2 March 2012.

At 31 December 2012, EDF's market capitalisation totalled €25.85 billion (compared to €34.76 billion at 31 December 2011).

## 2013

Between the start of 2013 and 28 March inclusive, EDF's share price increased by 7.01%, the CAC 40 index increased by 2.48% and the Euro Stoxx Utility (SX6P) sector index dropped by 1.6%.

At 28 March 2013, the closing price of the EDF share was €14.96. Its lowest closing price in 2013, through 28 March inclusive, was €13.66 on the 11 January 2013, and its highest closing price was €15.305 on the 26 March 2013.

At 28 March 2013, EDF's market capitalisation totalled €27.66 billion.

## 21.1.3 Treasury shares and share buyback programme

### 21.1.3.1 Share buyback programme in force as of the filing date of the reference document (programme authorised by the Ordinary Shareholder Meeting of 24 May 2012)

After consulting the Board of Directors' report, and in accordance with the provisions of Articles L. 225-209 *et seq.* of the French Commercial Code, the fifth resolution adopted by the General Meeting authorised the Board of Directors to implement a programme to buy back Company shares, capped at a maximum of 10% of the Company's capital.

This resolution immediately terminated the unused portion of the authorisation to purchase Company shares, which was granted by the seventh resolution adopted by the General Meeting held on 24 May 2011.

The aims of the share buyback programme are as follows: to deliver shares when rights are exercised that are attached to securities that represent debt instruments, which grant immediate or deferred access to the Company's shares by all means, as well as to perform all hedging transactions with respect to the obligations of EDF (or one of its subsidiaries) that are connected with such securities; to retain shares for future delivery in exchange or as payment in the context of external growth or contribution operations; to allocate shares to EDF group employees, in particular, within the framework of any share purchase or bonus share award plans under the terms stipulated by law and, in particular, by Articles L. 225-197-1 *et seq.* of the French Commercial Code or Articles L. 3332-18 *et seq.* of the French Labour Code; to reduce the Company's capital by cancelling all or part of the shares purchased; and, finally, to ensure the liquidity of EDF shares via an investment services provider, under a liquidity agreement that is consistent with the Code of Ethics recognised by the *Autorité des marchés financiers*.

Purchases of Company shares may involve any number of shares, provided that the number of shares that the Company purchases during the buyback programme does not exceed 10% of the shares that make up the Company's existing share capital on the date of the General Meeting, and provided that the number of shares that the Company holds at any one time does not exceed 10% of the shares that make up the Company's capital.

These shares may be acquired or transferred, under the conditions and within the limits, in particular in terms of volumes and price, provided for by the laws and regulations in force on the date of the relevant transactions, by any means, such as on the market or over the counter, including via block trades (purchases or sales), by the use of derivative financial instruments or notes or securities that grant access to Company shares, or by implementing option strategies, under the conditions stipulated by the market authorities

and at such times as determined by the Board of Directors or any person who is acting on the Board's behalf. This authorisation may be used during public takeover bids, within the limits permitted by the applicable regulations.

The General Meeting has set at €90 the maximum purchase price per share<sup>1</sup> and at €2 billion the maximum amount of funds allocated to the implementation of the programme, and has granted the Board of Directors full powers, with the right of delegation, to use this authorisation.

The authorisation was granted for a maximum of 18 months as from the General Meeting of 24 May 2012, and will therefore end on 24 November 2013, unless the General Meeting of 30 May 2013 adopts the new programme described in paragraph 21.1.3.3 below.

## 21.1.3.2 Summary of the Company's trading in its own shares during the 2012 fiscal year

Number of treasury shares held at 31 December 2012	2,161,333
Percentage of capital held through treasury shares at 31 December 2012	0.12%
Carrying value of the portfolio at 31 December 2012 <sup>(1)</sup> (in euros)	33,068,974.61
Market value of the portfolio at 31 December 2012 <sup>(2)</sup> (in euros)	30,215,435.34
Number of shares cancelled over the past 24 months	11,945,448

(1) Valued at the purchase price.

(2) Based on the closing price at 31 December 2012, i.e. €13.98.

### Liquidity contract

With effect from 24 July 2012, EDF terminated its liquidity contract with Crédit Agricole Cheuvreux signed on 1 June 2006 and renewed by tacit agreement every year since. The initial sum of €35 million was allocated to execution of the liquidity contract. At the contract termination date, the liquidity account contained 1,350,000 EDF shares and €4,408,111.48 in cash.

From 25 July 2012, EDF engaged Oddo Corporate Finance to implement a new liquidity agreement that complies with the Charter of Ethics of the *Association Française des Marchés Financiers* (AMAFI) as approved by the French market authority AMF. The following assets were allocated to this liquidity contract: 1,350,000 EDF shares transferred from the former liquidity contract and €50 million in cash.

In 2012, EDF paid the following commissions on its liquidity contracts:

- €92,852 to Crédit Agricole Cheuvreux;
- €34,849.32 to Oddo Corporate Finance.

### Number of shares bought and sold during the 2012 fiscal year

During the 2012 fiscal year, EDF purchased a total of 8,398,898 treasury shares and sold 7,413,159 shares.

During the 2012 fiscal year, the average share purchase price was €15.94 and the average share sale price was €15.95.

### Portfolio breakdown at 31 December 2012

At 31 December 2012, the Company held a total of 2,161,333 treasury shares. 2,110,739 of these shares (or 0.12% of its share capital) are held under the liquidity agreement, and the remaining 50,594 shares (0.0027%

of its share capital), were acquired on the market with a view to being allocated to employees within the framework of the "ACT 2007" bonus share award plan, but were not actually allocated (see section 17.4.9 ("Bonus share issues")).

On this date, EDF's subsidiaries did not hold any shares, either directly or indirectly.

### Post-closing transactions

Between 1 January 2013 and 28 March 2013, the Company acquired 3,642,586 treasury shares for an average unit value of €14.47, and sold 3,494,762 shares for an average unit value of €14.58.

## 21.1.3.3 Description of the programme submitted to the Combined Shareholders' Meeting of 24 May 2012 for authorisation

As stated above, the authorisation described in section 21.1.3.1 will end on 24 November 2013, unless the General Meeting of 30 May 2013 adopts the resolution described below.

In accordance with the draft resolution prepared by the Board of Directors' meeting of 13 February 2013, the Combined Shareholders' Meeting of 30 May 2013 will be asked to authorise a share buyback programme, the characteristics of which are similar to the programme authorised by the General Meeting of 24 May 2012, in particular with regard to the objectives of this programme, the limits on the number of shares that can be bought back, as well as the maximum purchase price (set at €60) and the maximum amount that may be allocated to the share buyback programme (€2 billion).

1. The Board of Directors may, however, adjust the aforementioned purchase price if premiums, reserves or profits are capitalised, which results either in an increase in the par value of the shares or the creation and award of bonus shares, and in the event of a stock split or reverse stock split, or any other transaction involving the shareholders' equity, in order to take into account the impact of these operations on share value.

## 21.1.4 Capital authorised but not issued

The following table presents a summary of the delegations of authority and authorisations to increase or reduce the share capital that are in force on the filing date of this reference document, which the Board of Directors was granted by the Combined Shareholders' Meeting of 24 May 2012, and the extent to which they have been used at 31 December 2012:

### Status of the authorisations adopted by the Combined Shareholders' Meetings of 24 May 2012

Securities concerned / type of issue	Term <sup>(1)</sup> of the authorisation and expiration	Maximum nominal increase or reduction in capital (in millions of euros)	Use made of the authorisations (in millions of euros)
Delegation of authority to the Board to increase the capital with maintenance of the shareholders' preferential subscription right	26 months 24 July 2014	45 <sup>(2)</sup>	none
Capital increase, all securities combined			
Delegation of authority to the Board to increase the capital with cancellation of the shareholders' preferential subscription right	26 months 24 July 2014	45 <sup>(2)</sup>	none
Capital increase, all securities combined			
Delegation of authority to the Board to make offers for private placements <sup>(3)</sup> with cancellation of the shareholders' preferential subscription right	26 months 24 July 2014	45 <sup>(2)</sup>	none
Capital increase, all securities combined			
Authorisation for the Board to increase the number of securities to be issued in the event of a capital increase, with or without preferential subscription rights	26 months 24 July 2014	15% of the amount of the initial issue <sup>(2)</sup>	none
Capital increase, all securities combined			
Delegation of authority to the Board to increase the capital through the capitalisation of reserves, profits, premiums or otherwise	26 months 24 July 2014	1,000	none
Delegation of authority to the Board to increase the capital as consideration for a public exchange bid initiated by the Company	26 months 24 July 2014	45 <sup>(2)</sup>	none
Authorisation for the Board to increase the capital to compensate in-kind contributions <sup>(4)</sup>	26 months 24 July 2014	10% of the Company capital up to a maximum of 45 <sup>(2)</sup>	none
Delegation of powers to the Board to increase the capital for the benefit of savings plan members	26 months 24 July 2014	10	none
Issues reserved for the personnel			
Authorisation for the Board to reduce the capital by cancelling treasury shares	26 months 24 July 2014	10% of the capital by 24-month periods	none

(1) As from 24 May 2012, the date of the Combined Shareholders' Meeting.

(2) The nominal aggregate limit on the share capital increase of €45 million applies to all capital increases, with the exception of capital increases through capitalisation of reserves, premiums, profits or otherwise and capital increases that are reserved for savings plan members.

(3) Offers governed by Article L. 411-2 II of the French Monetary and Financial Code, in that they are exclusively intended for persons who provide investment portfolio management services on behalf of third parties or qualified investors or a restricted circle of investors acting on their own behalf.

(4) Article L. 225-147 of the French Commercial Code.

## 21.1.5 Other equity securities

On the filing date of this reference document, other than the common shares of Company stock, there are no other securities that grant access to EDF's share capital, either directly or indirectly.

## 21.1.6 Non-equity securities

On 18 April 1996, EDF implemented a programme to issue debt securities in the form of Euro Medium Term Notes (the "EMTN" programme). Since this date, this programme has been renewed each year.

On 1st June 2012, EDF proceeded with an annual update to the debt security issue programme for a maximum amount of €30 billion.

In 2012, EDF issued the following bond:

- €2 billion from a 10-year bond with annual coupon of 3.875%, on 18 January 2012;
- €1 billion from a 15-year bond with annual coupon of 4.125%, and £500 million from a 25-year bond with annual coupon of 5.5%, on 27 March 2012;
- €2 billion from a 10.5-year bond with annual coupon of 2.75%, on 10 September 2012.

This operation will contribute to the financing of the Group's investment strategy and falls within the scope of the policy to extend the maturity of its debt.

A description of the Group's bond debt is provided in note 38 to the consolidated financial statements at 31 December 2012.

### 21.1.7 Changes in the share capital

Pursuant to the law of 9 August 2004, EDF was converted into a *société anonyme* (joint-stock company) on 20 November 2004 and its capital set at €8,129,000,000, divided into 1,625,800,000 shares with a par value of €5.

The EDF General Meeting of 31 August 2005 granted full powers to the EDF Board of Directors with a view to reducing the capital by a maximum amount of €7,316,100,000, via a reduction in the par value of shares from €5 to a minimum of €0.5. During its meeting of 27 October 2005, the Board of Directors decided to reduce the share capital by €7,316,100,000, via a €4.5 reduction in the par value of shares, which therefore decreased from €5 to €0.5. The share capital was thus reduced to €812,900,000.

During its 18 November 2005 meeting, Board of Directors used the authority granted to it by the Combined Shareholders' Meeting of 10 October 2005, and approved the increases in the Company's share capital in connection with the Open Price Offering and the Guaranteed Global Placement that were performed when the Group was first listed on the stock market. As a result, the Board of Directors increased the share capital to €906,834,514.

On 20 December 2005, Calyon (now Crédit Agricole-CIB) paid EDF the price that corresponded to the exercise of 8,502,062 warrants that the EDF Board issued to Calyon by decision taken on 18 November 2005. Consequently, the share capital was increased to €911,085,545 divided into 1,822,171,090 common shares.

## 21.2 Bylaw provisions

### 21.2.1 Corporate purpose

EDF's purpose, both in France and abroad is:

- to ensure the generation, transmission, distribution, supply and trading of electrical energy, and the import and export of said energy;
- to carry out the public service missions assigned to EDF by the laws and regulations, in particular by the French Energy Code, and Article L. 2224-31 of the French Local Authorities Code, as well as by concession agreements, and in particular the mission to develop and operate public electricity grids and the mission to supply energy to non-eligible customers, and to supply back-up power to electricity producers and customers with the aim of compensating for unforeseen supply failures, and to supply electricity to eligible customers who cannot find a supplier, while contributing to the goals defined by the multi-year generation investments programme defined by the Minister for Energy;

The payment of dividends in shares on 17 December 2009 (see section 20.4.1 ("Dividends and interim dividends paid within the last three fiscal years")) resulted in an increase in the share capital of €13,347,786 following the issue of 26,695,572 shares. On 21 January 2010 the share capital was thus increased to €924,433,331 divided into 1,848 866,662 common shares.

On 24 June 2011, the capital was increased to €930,406,055 divided into 1,860,812,110 common shares, via the issue of new shares as consideration for the EDF Énergies Nouvelles shares contributed to EDF in exchange for the EDF shares tendered as part of the alternative simplified public purchase or exchange offer involving EDF Énergies Nouvelles shares, which was initiated by EDF (see section 6.4.1.2.2 ("EDF Énergies Nouvelles")). Then, on 28 September 2011, the capital was reduced to €924,433,331 divided into 1,848,866,662 common shares, via the cancellation of the shares purchased as part of the share buyback programme with a view to cancellation, in order to offset the dilution caused by the aforementioned offer.

### 21.1.8 Information on the capital of every Group member that is the subject of a conditional or unconditional agreement

The acquisition and disposal commitments involving securities in subsidiaries are described in note 44 to the consolidated financial statements for the fiscal year ended 31 December 2012.

With the exception of these commitments to acquire and dispose of securities and any other commitments that are described in section 6 ("Business overview") of this reference document, EDF has not made any promises to purchase or sell that would make it possible to acquire or dispose of, as applicable, all or part of the capital of the Company or of any of its subsidiaries, as defined in Article L. 233-1 of the French Commercial Code.

### 21.1.9 Pledge of the Company's securities

To the Company's knowledge, none of the Company's common shares that make up its share capital have been pledged.

- more generally, to engage in any industrial, commercial or service activity, including research and engineering activities, in the field of energy, for all categories of customer;
- to enhance the value of all the personal and real property assets it holds or uses;
- to create, acquire, rent or lease under a business lease, all personal property, real property, businesses and clientele, to lease, install and operate all establishments, businesses and clientele, plants and workshops relating to any one of the aforementioned purposes;
- to obtain, acquire, operate or sell all processes and patents concerning the activities that are related to any of the aforementioned purposes;
- to take part, directly or indirectly, in all transactions that may be connected to any of the aforementioned purposes, by creating new companies or undertakings, by contributing, subscribing for or purchasing equity or ownership interests, stakes, or through mergers, partnerships or in any other way whatsoever; and



- more generally, to engage in all industrial, commercial, financial transactions, whether in personal or real property, that are directly or indirectly connected, in whole or in part, to any similar or related purposes or even to any purposes that may favour or develop the Company's business.

## 21.2.2 Fiscal year

Each fiscal year lasts for 12 months, starting on 1 January and ending on 31 December of each year.

## 21.2.3 Appropriation of profits under the bylaws

The distributable profit consists of the net profit for the fiscal year, less prior losses carried forward and the various deductions provided for by the law, plus any retained earnings carried forward.

The General Meeting may decide to distribute amounts that are deducted from the reserves that are freely available to it, but must expressly state the reserve items from which the deductions are made.

After approving the financial statements and confirming the existence of distributable amounts (which include the distributable profit and any amounts deducted from the reserves mentioned above), the General Meeting can decide to distribute all or part of such amounts to the shareholders in the form of a dividend, allocate them to reserve items or carry them forward.

The General Meeting has the option of granting the shareholders a choice, for all or part of the dividend or interim dividend paid out, between payment in cash and payment in shares under the conditions laid down by law. Moreover, the General Meeting may decide, for all or part of the dividend, interim dividends, reserves or premiums that are distributed or for any reduction in capital, that said distribution or said reduction will be paid in kind through remittance of the Company's assets.

The Board of Directors has the option of distributing interim dividends prior to the approval of the financial statements for the fiscal year, under the conditions provided for by law.

The Combined Shareholders' Meeting of 24 May 2011 approved the amendment to EDF's bylaws to insert a provision for the payment of an increased dividend to shareholders who have held their shares in registered form for at least two years (see section 20.4.2 ("Distribution policy, increased dividend"). In accordance with the law, the first increased dividend will be paid after the closure of the second fiscal year that follows the amendment of the bylaws, i.e. in 2014 for the dividend that will be distributed in respect of the 2013 fiscal year.

## 21.2.4 Rights attached to shares

Each share entitles its holder to a portion of the Company's profit and corporate assets that is proportional to the percentage of the capital that the share represents. Moreover, each share confers a voting right and the right to be represented at Shareholders' Meeting in accordance with legislative, regulatory and statutory restrictions.

On the filing date of this reference document, EDF has only issued a single class of shares.

Ownership of a share automatically entails acceptance of the by laws and decisions adopted by General Meetings.

Shareholders are only liable for losses within the limit of their contributions.

Whenever it is necessary to hold more than one share in order to exercise any right whatsoever, in the event of an exchange, reverse stock split or allocation of shares, or due to a capital increase or reduction, a merger or any other corporate transaction, owners of single shares or numbers of shares below that required may only exercise such right if they take personal

responsibility for consolidating or, if necessary, purchasing or selling the requisite number of shares.

Shareholders can choose to hold shares in registered or bearer form, subject to compliance with the laws and regulations.

Shares may be registered with an intermediary under the conditions provided for in Articles L. 228-1 et seq. of the French Commercial Code.

Intermediaries must declare their status as intermediaries who hold shares for a third party, under the conditions provided for in the laws and regulations. These provisions are also applicable to the other securities issued by the Company.

Under the conditions provided for by the law and regulations in force, the Company is entitled to request from the central custodian of financial instruments, at any time and provided that it pays the required consideration, as applicable, the name or corporate name, the nationality, the year of birth or the year of incorporation, and the address of the holders of bearer shares that grant an immediate or deferred right to vote at its own Shareholders' Meetings, as well as the quantity of securities held by each of these shareholders and, where applicable, any restrictions to which the securities may be subject. On the basis of the list provided by such custodian, the Company has the option of asking the persons or entities listed that the Company believes may be registered on behalf of third parties, for the information stated above concerning the owners of the securities.

For registered shares that grant immediate or deferred access to the capital, intermediaries that are registered under the conditions provided for in Article L. 228-1 of the French Commercial Code mentioned above, are required, within ten business days as from the request made by the Company or its agent, which may be made at any time, to disclose the identity of the owners of said securities.

## 21.2.5 Assignment and transfer of shares

Shares can be traded without restriction, subject to compliance with the provisions of the law and regulations. They are registered in an account and are transmitted by transfer from one account to another.

## 21.2.6 Changes to the bylaws, the capital and the rights attached to votes

All changes to the bylaws, the capital or the voting rights attached to the securities that make up the capital are subject to the requirements of law, as the bylaws contain no specific provisions regarding such matters.

## 21.2.7 Shareholder's Meetings

### 21.2.7.1 Convening notices to meetings

General Meetings are convened by the Board of Directors or, in the last resort, by the Statutory Auditors or by any person empowered to do so. Meetings are held at the registered office or at any other place stated in the convening notice.

### 21.2.7.2 Participation in meetings and exercise of voting rights

General Meetings may be held by video conference or telecommunication means that allow for shareholders to be identified. The conditions governing the type and use of such means are specified in Articles R. 225-97 to R. 225-99 of the French Commercial Code. In such cases, shareholders who

participate in the meeting by such means are deemed to be present for the calculation of the quorum and majority, under the conditions specified by law.

All shareholders can attend General Meetings, regardless of the number of shares they own.

Shareholders can choose between one of the three following methods of participation: attend the meeting in person by requesting an admission card, grant authorisation (a proxy) to the Chairman of the General Meeting or to any individual or legal entity of their choice (Article L. 225-106 of the Commercial Code), or vote by mail.

In accordance with Article R. 225-85 of the Commercial Code, proof of the right to participate in a General Meeting is obtained by the registration of the securities in an account in the name of the shareholder or of the intermediary that is registered on the shareholder's behalf (pursuant to paragraph 7 of Article L. 228-1 of the Commercial Code), on the third day prior to the meeting, i.e. at midnight, Paris time, or in the registered share accounts held by the Company (or its authorised representative), or in the bearer share accounts held by the accredited intermediary.

In accordance with Article R. 225-85 of the Commercial Code, the entry or registration of the securities in the bearer share accounts held by financial intermediaries is evidenced by a shareholding certificate issued by these intermediaries, where applicable by electronic means under the conditions provided for in Article R. 225-61 of the Commercial Code, as an appendix to the postal voting form, the voting proxy or attendance card request made on behalf of a shareholder or on behalf of a shareholder who is represented by the registered intermediary.

All shareholders may grant a proxy to any individual or legal entity of their choice in order to be represented at a General Meeting. Proxies, as well as any proxy revocations, must be evidenced in writing and notified to the Company. Proxies may be revoked in the same forms as those required for the designation of the proxy holder, including by electronic means if need be. The owners of shares that are properly registered in the name of an intermediary under the conditions provided for in Article L. 228-1 of the French Commercial Code may be represented by a registered intermediary under the conditions provided for in said article.

In addition to the participation and voting rules set out above, holders of bearer shares may also use the new online Votaccess platform for the General Meeting of 30 May 2013: this platform allows holders of bearer shares to send their voting instructions electronically request an admission card and grant or withdraw a proxy, before the General Meeting is held. Only holders of bearer shares for whom the custodian is affiliated to the Votaccess system and offers them this service for the 30 May 2013 General Meeting can access this platform.

EDF gives its shareholders the possibility of voting online, prior to the General Meeting, on the dedicated voting website that is made available by the Company's authorised representative.

### 21.2.7.3 Requests for the inclusion of items or draft resolutions on the agenda and written questions to the Board of Directors

The shareholders who meet the conditions provided for in Article R. 225-71 of the Commercial Code may request the inclusion of items or draft resolutions on the General Meeting agenda within 20 calendar days as from the publication of the meeting notice, in accordance with Article R. 225-73 of the Commercial Code.

Requests for the inclusion of items on the agenda must be substantiated. The wording of the draft resolutions, as well as a brief explanation of the reasons, must accompany requests for the inclusion of draft resolutions.

On the date of the request, the authors must provide proof of owning or representing the percentage of the capital required by Article R. 225-71 of the Commercial Code. Requests must be accompanied by proof of entry in an account. Agenda items or draft resolutions that are proposed

for inclusion are only reviewed if the authors of the request submit a new certificate proving the registration of the securities in the same accounts on the third day prior to the meeting.

Each shareholder also has the option of sending the Board of Directors written questions of his or her choice. The Board of Directors will answer the questions during the meeting, or, in accordance with Article L. 225-108 of the Commercial Code, the answer is deemed to have been given provided that it is published on the Company's website.

Written questions must be sent to the Company by registered letter with return receipt or by electronic telecommunication at the latest on the fourth business day prior to the date of the General Meeting. In accordance with Article R. 225-84 of the Commercial Code, these questions must be accompanied by a shareholding certificate, in order to be taken into account.

### 21.2.7.4 Temporary disposals during meeting periods

In accordance with the provisions of Article L. 225-126 of the French Commercial Code, any person who holds, alone or together with other persons, in respect of one or more temporary disposals or any transaction that grants the right to or requires the resale or return of said shares to the assignor, a number of shares that represents more than 0.5% of the voting rights in a listed company, must inform the Company and the *Autorité des marchés financiers* no later than midnight, Paris time, on the third business day prior to the General Meeting, and when the contract that arranges this transaction remains in force on this date, said information must include the total number of shares held on a temporary basis. In addition to the number of shares acquired, this declaration must contain the identity of the assignor, the date and the expiration of the contract that organises the transaction and, as applicable, the voting agreement.

If no information is provided to the company and the *Autorité des marchés financiers*, the shares thus acquired are automatically stripped of voting rights for the Shareholders' Meeting concerned and for all Shareholders' Meetings that are held until such shares are resold or returned.

Moreover, the company representative, a shareholder or the *Autorité des marchés financiers* may petition the Commercial Court to order the complete or partial suspension, for a maximum of five years, of the voting rights of any shareholder who fails to provide such information, regardless of whether or not the voting borrowing shareholder has exercised his or her voting rights.

### 21.2.8 Bylaw provisions that delay acquisition of control over the Company

Pursuant to the Article L. 111-67 and the EDF bylaws, changes in share capital cannot result in the French State's shareholding falling below the statutory 70% threshold. With the exception of this restriction, no other provision in the bylaws specifically aims to prevent or delay the takeover of the Company by a third party.

### 21.2.9 Threshold disclosure requirements

Pursuant to the provisions of the French Commercial Code, any individual or legal entity, acting alone or together with other persons or entities, that acquires a number of shares that represents more than 5%, 10%, 15%, 20%, 25%, 30%, 33.3%, 50%, 66.6%, 90% or 95% of the capital or voting rights must inform the Company, no later than prior to the close of business on the fourth trading day following the day on which the shareholding threshold is exceeded, of the total number of shares or voting rights owned (Article R.233-1 of the French Commercial Code). Moreover, such

individuals or legal entities must also inform the AMF of these acquisitions no later than prior to the close of business on the fourth trading day after exceeding the shareholding threshold (Article 223-14 of the AMF General Regulation). The AMF publishes threshold crossings that are notified to it.

Since 2012, the cash payoff derivative and having a similar economic effect to detention of underlying shares, are taken into account for this calculation of the threshold crossing (article L. 233-9 I 4° bis of the French Commercial code). Pursuant to AMF General Regulations, holders of these financial instruments must take into account the number of shares that carry this type of agreement and financial instruments for the calculation of their participation in the framework of their reporting obligation, and must precise, when they declare threshold crossing, their intention as to the outcome of this type of agreements and financial instruments they benefit from.

Within the same timeframes and under the same conditions, this information must also be disclosed when the capital or voting rights fall below the thresholds stated above.

Absent a proper declaration, the shares that exceed the fraction which should have been declared in accordance with the provisions of law mentioned

above will be stripped of voting rights for all Shareholders' Meetings that are held during a two-year period following the date on which the effective disclosure is made.

Moreover, the Company bylaws provide that any individual or legal entity, acting alone or jointly, who acquires or ceases to hold, directly or indirectly, a number of shares that corresponds to 0.5% of the Company's capital or voting rights, or a multiple of said fraction, is required to inform the Company, by registered letter with return receipt requested, at the latest before the close of business on the fourth trading day following the crossing of such threshold, of the total number of shares, voting rights or equity interests held.

Failure to comply with the above provisions is punishable by the loss of voting rights for the shares that exceed the fraction that should have been declared, for all Shareholders' Meetings that are held until the expiration of a two-year period following the date of the effective threshold disclosure provided for above, if the application of this penalty is requested by one or more shareholders who hold at least 1% of the Company's capital. Such requests are recorded in the minutes of General Meetings.



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## 22 Material contracts

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With the exception of any contracts described in chapters 6 (“Business overview”) and 9 (“Operating and financial review”) of this reference document, and possibly in chapter 12 (“Information on trends”) for those who were entered into after the closing of 2012 financial year, EDF has not concluded, during the two years preceding the date of filing of this reference document, any material contracts other than those entered into in the ordinary course of business.



Photo credit © EDF – Philippe Dureuil

## 23 Third party information, statement by experts and declaration of interests

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None.





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# 24 Documents available to the public

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The Company's releases, annual reports, including historical financial information relating to the Company and any related updates filed with the AMF, are available on the Company's website: <http://finance.edf.com/finance-41326.html>. Copies of these documents may also be obtained at the Company's registered office at 22/30, avenue de Wagram in Paris, France.

All of the regulated information published by the Company, pursuant to article 221-1 et seq., in the AMF's general regulation, is available at the following address: <http://finance.edf.com/actualites-et-publications/information-reglementee>.

Finally, the documents and information referred to in article R. 225-73-1 of the French Energy Code, may be viewed at the Company's registered office.

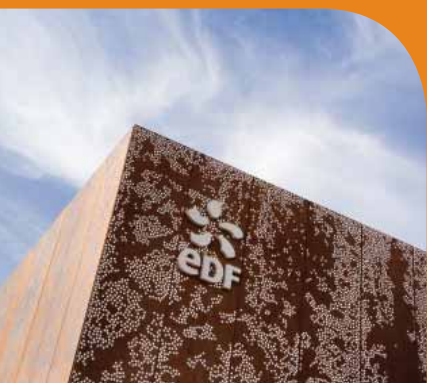


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# 25 Information on holdings

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For information about the companies in which EDF holds an interest that could have a significant effect on an assessment of its holdings, its financial position or financial results, see Chapters 7 ("Organisational charts") and 6 ("Business overview") as well as note 52 to the consolidated financial statements for the year ended 31 December 2012.

# Glossary

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**ANDRA**  
*(Agence nationale pour la  
gestion des déchets radioactifs)*

In France, radioactive waste is managed by the National Agency for Radioactive Waste Management (“ANDRA”), a public industrial and commercial institution created under the French law of 30 December 1991. To this end, the agency, which is overseen by the Ministries of Industry, Research and the Environment, commissioned the storage centres in the French department of Aube for the long-term management of short-lived waste.

**AP913 Procedure**

Standard procedure created by the INPO (Institute of Nuclear Power Operations) to verify equipment reliability and implement equipment health checks. This procedure consists of classifying components according to the consequences of their failure. It enables the development of a maintenance strategy that is adapted to the criticality of each component.

**Architect-Assembler**

For EDF, the architect-assembler has control over:

- the design and operation of its power plants;
- the organisation of development projects;
- the schedule for completion and costs of construction;
- relations with the French Nuclear Safety Authority; and
- the integration of feedback from operational experience.

EDF's role as architect-assembler ensures control over its industrial policy with respect to the design, construction and operation of its fleet of power plants.

**ASN**  
*(Autorité de sûreté nucléaire)*

On behalf of the Government, the Nuclear Safety Authority (“ASN”) supervises nuclear safety and radiation protection in France to protect workers, patients, the public and the environment from the risks related to the use of nuclear power. It is responsible in particular for the external oversight of nuclear facilities in France. The ASN is an independent administrative authority comprised of over 300 people. At the national level, the ASN is represented by the Directorate-General for Nuclear Safety and Radiation Protection (“DGSNR”).

**Assembly/Fuel**

Nuclear fuel is in the form of an assembly made up of an array of 264 fuel rods, bound together by a rigid structure made of tubes and grids. Each fuel rod consists of a water-tight zirconium tube into which uranium oxide pellets are piled, constituting the fuel. The assemblies are loaded side by side into the reactor vessel – 205 assemblies are required for a 1,500MW reactor – to make up the core of the reactor. During operation, these assemblies are crossed by bottom to top with primary water which heats on contact and carries this energy to the steam generators.

**Balancing Mechanism**

Created by RTE on 1 April 2003, the balancing mechanism allows it to use power reserves that can be mobilised in the event of an imbalance between supply and demand.

**Becquerel (Bq)**

International legal unit for measuring radioactivity. The Becquerel (Bq) is equal to one disintegration per second. The activity represented by this unit is so low that multiples of it are used: the MBq (megabecquerel or million Becquerels) and the GBq (gigabecquerel or billion Becquerels).

**Caisse nationale des IEG**

Administrative management body created in 2004; since 2005, it has been responsible for the retirement and other benefits system for employees in the electricity and gas industry (including risks of old age, work accidents, occupational diseases, disability and death and recovery of contributions owed by employers and employees).

**Capacity auctions**

At the beginning of 2001, the Group agreed to auction a portion of its generation in order to allow European energy groups to compete in the French market just as EDF competes in foreign markets. This agreement, signed with the European Commission, stipulated that EDF would sell 6,000MW of its electricity “capacities” or 8% of the electricity generated in France.

**Clean Development Mechanism (CDM)**

The CDM is a mechanism defined by the Kyoto Protocol based on projects to reduce emissions or capture greenhouse gases (GHS) and sustainable development plans in developing countries. This mechanism provides that any public or private entity in a country on Schedule I (industrialised countries) which makes investments in such projects in a country on Schedule II (developing countries) acquires carbon credits in return. These credits can then be used by those Parties to meet their emission quotas, or they can be sold on the carbon market in International Emissions Trading (IET) or the EU emissions quota trading system (EU ETS).

The CDM is placed under the authority of the Conference of the Parties acting as a meeting of the parties to the Kyoto Protocol, supervised by an Executive Board, the powers of which were defined by the 2001 Marrakech agreements.

<b>Cogeneration</b>	Generation technique for combined electricity and heat production. The advantage of cogeneration is the ability to capture the heat produced by the fuel whereas in traditional electricity generation this heat is lost. This process also allows the same facility to meet the heating (hot water or steam) and electricity needs of both industrial and local authority customers. This system improves the energy efficiency of the generation process and reduces fuel use by an average of 20%.
<b>Combined-Cycle Gas</b>	The most recent technology for generating electricity in a natural gas-fired plant. A combined cycle is made up of one or more combustion turbines and a steam turbine allowing for an improved yield. The syngas is routed to the combustion turbine, which generates electricity and very hot exhaust gases (effluents). The heat from the exhaust gases is recovered by a boiler, thus producing steam. Part of the steam is then recovered by the steam turbine to generate electricity.
<b>Congestion</b>	Situation in which an interconnection linking the national transmission grids cannot absorb all of the physical flows resulting from international exchanges required by market operators due to a shortage of capacity in the interconnection and/or the national transmission grids involved.
<b>CRE</b> <i>(Commission de Régulation de l'Énergie)</i>	The French Energy Regulatory Commission ("CRE") was created on 30 March 2000 to ensure the proper functioning of the electricity and gas market. The CRE, an independent body, regulates the opening of the French energy market. It ensures that all of the generators and eligible customers have non-discriminatory access to the network. Within its jurisdiction, this body supervises and authorises, settles any disputes and, if required, imposes sanctions. For a detailed description of its powers, see section 6.5.3.2 ("French legislation: Energy Code").
<b>Distribution network</b>	Downstream of the transmission network, medium- and low-voltage distribution networks serve end-users (residential, local authorities, SMEs, SMLs, etc.).
<b>DNN</b>	Non-Nationalised Distributor.
<b>Downstream</b>	See "Fuel Cycle" and "Downstream Asset Portfolio".
<b>Downstream Asset Portfolio</b>	All contractual energy disposal commitments involving operators or end users.
<b>EAR</b> <i>(Earning at Risk)</i>	A financial indicator providing a statistical measure of risk of maximum potential loss of a company's income versus its budgeted income in the event of unfavourable market movements over a certain period of time and within a given confidence interval.
<b>EBITDA</b>	Earnings before interest, taxes, depreciation and amortisation, corresponding to gross operating profit.
<b>Effects of changes in the scope of consolidation</b>	Effects of changes in the scope of consolidation, occurring during a given year, including acquisitions, disposals and changes in the Group's scope of consolidation.
<b>Effects of exchange rate variations</b>	The impact of exchange rates recognised in the income statement for a financial year, reflects the fluctuations in average exchange rates between the euro and another operational currency in use by the subsidiaries within the Group's scope of consolidation.
<b>Electric and Gas Industries (IEG) status</b>	Special status instituted in 1946 applicable to active and retired (inactive) electricity and gas industry employees in France, which differs from ordinary law in the following areas: <ul style="list-style-type: none"> <li>■ retirement benefits;</li> <li>■ collective agreements (salary scale, working hours and organisation);</li> <li>■ employee representative institutions;</li> <li>■ social activities.</li> </ul>
<b>Electricity supply</b>	Electricity demand can be broken down into four types of consumption: <ul style="list-style-type: none"> <li>■ the "basic" (or "ribbon") supply of electricity, which is generated and consumed throughout the year;</li> <li>■ "semi-basic" supply is the electricity generated and consumed over the winter period;</li> <li>■ "peak" supply corresponds to periods of the year when electricity generation or supply is in heavy demand;</li> <li>■ "lace" supply is a complement to "ribbon" supply.</li> </ul>
<b>Electricity Value Chain</b>	The electricity value chain includes both deregulated activities (generation and supply) and regulated activities (transmission and distribution).
<b>Enrichment</b>	Process to increase the fissile content of an element. In its natural state uranium is 0.7% uranium 235 (fissile) and 99.3% uranium 238 (non fissile). To enable its efficient use in a pressurised water reactor, it is enriched with uranium 235 whose proportion is increased to around 4%.

<b>Enriched uranium</b>	Uranium, whose isotope 235 content, the only fissile material, has been increased from its low natural level (0.7%) to approximately 4% for pressurised water reactor fuel.
<b>Entity Responsible for Balance</b>	Entities with which RTE signs a contract for the financing of shortfalls between forecast and actual consumption and the production of a portfolio of users brought together by the balance responsible entity which plays a role of insurer covering the potential losses arising from the many differences between over- and under- supply.
<b>ERU (enriched reprocessed uranium)</b>	To be used in a reactor, reprocessed uranium (RepU), even if containing more fissile uranium than in its natural state, must be further enriched. It is therefore called re-enriched uranium (ERU).
<b>EPR</b>	European Pressurised Reactor. The latest generation of reactors currently under construction (known as generation 3), it is the result of Franco-German cooperation, and offers advanced safety, environmental and technical performance.
<b>Fluorination (conversion)</b>	Also called "conversion", fluorination allows for the purification of uranium compounds and their transformation into uranium hexafluoride (UF <sub>6</sub> ), allowing their enrichment using current techniques.
<b>FNCCR</b>	French National Federation of Licensors and Local Utilities ( <i>Fédération nationale des collectivités concédantes et régies</i> ).
<b>Fuel</b>	See Assembly/Fuel.
<b>Fuel Cycle</b>	<p>The nuclear fuel cycle encompasses all industrial operations in France and abroad which enable the supply of the fuel to generate energy in a reactor, then to unload and process it. The cycle can be broken down into three stages:</p> <ul style="list-style-type: none"> <li>■ upstream: the processing of concentrates from uranium ore, the conversion, enrichment and production of fuel (which takes more than two years);</li> <li>■ the core of the cycle corresponding to the use of fuel in the reactor: receipt, loading, operation and discharging (which takes three to five years);</li> <li>■ downstream: pool storage, reprocessing of spent fuel in reactors of recoverable material, vitrification of highly radioactive waste, then temporary storage of the waste before storage.</li> </ul>
<b>Generic Hazard</b>	In the nuclear field, an unpredictable technical incident common to a set of nuclear plants.
<b>Greenhouse gases</b>	Gas that retains a portion of the solar radiation in the atmosphere and for which an increase in emissions due to human activity (man-made emissions) causes an increase in the earth's average temperature and plays an important role in climate change. The Kyoto Protocol and amended EC Directive 2003/87/EC of 13 October 2003 cover the six following principal greenhouse gases: carbon dioxide (CO <sub>2</sub> ), methane (CH <sub>4</sub> ), nitrogen protoxide (N <sub>2</sub> O), hydrofluorocarbons (HFC), perfluorated hydrocarbons (PFC) and sulfur hexafluoride (SF <sub>6</sub> ). For the 2005-2007 period, carbon dioxide was the subject in Europe of measures to reduce emissions with the application of national plans for the allocation of greenhouse gas quotas. For the 2008-2012 periods, the scope of gases is expanding. In the long term, the gases listed in Appendix II of the aforementioned directive will be covered, as will "any other gaseous atmospheric component, whether natural or man-made, that absorbs and reflects infrared radiation" (amended directive, adopted but not published to date).
<b>Gross energies margin</b>	Gross energies margin is calculated based on accounting data from the income statement and represents the margin on energy, fuel and transmission costs generated by energy (i.e., electricity and gas) sales.
<b>Heterojunction</b>	A heterojunction solar cell has a p-n junction made from two different semi-conductor materials. This technology is more advanced than the homojunction and increases conversion yields. In the case of crystalline silicon, the junction is made from crystalline silicon (heavy) and a thin film of amorphous silicon. Thin-film technologies based on CIGS (copper, indium, gallium, selenide) or on CdTe (Cadmium telluride) are also heterojunction cells.
<b>Homojunction</b>	Inside a solar cell, the p-n junction between two layers of semi-conductor material (one positively doped (p) and the other negatively doped (n)), separates the charges generated by light. In a homojunction solar cell, the layers in this p-n junction are made from the same material. This is the case in conventional crystalline silicon technology.
<b>IAEA</b>	International Atomic Energy Agency based in Vienna (Austria).
<b>Interconnection</b>	Electricity transmission infrastructure that allows for exchanges of energy between different countries, by connecting the transmission network of one country to that of a neighbouring country.
<b>Intermediate Storage</b>	Intermediate stage in the process of managing nuclear waste. It involves placing waste packages in a facility to ensure, for a given period of time, their isolation from contact with man and the environment with the intention of retrieving them for a further stage in the waste management process. Intermediate storage facilities are designed, built and managed by the producers of such waste (EDF, AREVA NC (formerly COGEMA) and CEA) and are close to areas where waste is conditioned.



<b>Interruptibility</b>	Voluntary reduction of electrical power by a customer, in exchange for compensation. It is called “diffused” when it is due to the aggregation of small consumption sites.
<b>IPP</b>	An Independent Power Producer, whose operations are not state-regulated. IPP can only refer to projects and/or units developed outside France.
<b>LDC</b>	French Local Distribution Companies. Local Distribution Companies sell and deliver electrical energy to end users located in their exclusive service area.
<b>LNG (Liquefied Natural Gas)</b>	Natural gas turned into liquid form by reducing its temperature to -162°C allowing for a reduction by 600 in its volume.
<b>Metering</b>	A system allowing for the recording, at a given network connection point, of the volumes of electricity transmitted or distributed (power, frequency, active and reactive energy).
<b>Midstream</b>	All assets of the gas business, allowing for its availability, transportation and management. These might be infrastructures (gas pipelines, storage facilities, LNG terminals, etc.) or contractual (rights relating to pre-determined capacity, procurement contracts, etc.). The midstream segment includes the trading and negotiating activities.
<b>MOX (Mixed Oxides)</b>	Nuclear fuel based on a mixture of uranium oxides (natural or depleted) and plutonium.
<b>MW/MWh</b>	<p>The MWh is the energy unit generated by a facility and is equal to the facilities’ power, expressed in MW, multiplied by the duration of operations in hours.</p> <p>1MW = 1,000 kilowatts = 1 million watts</p> <p>1 MWh = 1MW generated in one hour = 1 megawatt-hour</p> <p>1GW = 1,000MW = 1 billion watts</p> <p>1 TW = 1,000GW</p>
<b>MWh cumac</b>	The MWh cumac is the certificate energy unit of counting which corresponds to the cumulative energy savings aggregated on the operations’ lifetime.
<b>National Quota Allocation Plan</b>	This plan defines the total quantity of greenhouse gas emission quotas that the French government plans to grant for the quotas exchange system for each multi-year period (NAP 1: 2005-2007, NAP 2: 2008-2012) and the allocation method used to allocate quotas to the industrial facilities in question.
<b>Non-interconnected zones</b>	Zones in France which are not connected to metropolitan France (Corsica and Overseas departments).
<b>Nuclear safety</b>	Nuclear safety includes all of the technical, organisational and human measures which are intended to prevent accident risks and to limit the effects of an accident, and which are taken at every stage of the life of a nuclear power plant (from design to operation and finally to decommissioning).
<b>Nuclear tranche</b>	Electrical production unit consisting of a nuclear boiler and a turbo-alternator generator. A nuclear tranche essentially consists of its reactor type and the power of its turbo-alternator generator. EDF nuclear plants include two or four tranches, and occasionally six.
<b>PCB</b>	Polychlorobiphenyls
<b>PCT</b>	Polychloroterphenyls
<b>Plant availability</b>	Fraction of power available, out of theoretical maximum energy, counting only technical non-availability. The availability coefficient (Kd) is defined as the ratio between annual actual generation capacity (or amount producible annually) and maximum theoretical generation capacity, where maximum theoretical generation capacity = installed capacity × 8,760h. The Kd, which counts only technical non-availability, i.e., scheduled shutdowns, unplanned outages and testing periods, characterises a plant’s industrial performance. For EDF’s nuclear fleet in France, the maximum theoretical generation capacity is of 553 TWh (63.1GW × 8,760h).
<b>Plutonium (Pu)</b>	Element with the atomic number of 94 (number of neutrons) and no naturally occurring isotopes (elements whose atoms possess the same number of electrons and protons – thus the same chemical properties – but a different number of neutrons). Plutonium 239, a fissile isotope, is produced in nuclear reactors from uranium 238.

<b>Post-employment benefits</b>	<p>Specific benefits acquired due to electricity and gas industry (IEG) status, in addition to ordinary French law, recognised according to IAS 19 and related primarily to:</p> <ul style="list-style-type: none"> <li>■ specific supplementary retirement benefits;</li> <li>■ end-of-service awards and exceptional supplementary retirement benefits;</li> <li>■ energy benefits in kind (gas and electricity) and compensatory payments for education expenses;</li> <li>■ asbestos-related benefits and annuities for accidents at work or occupational diseases for inactive agents;</li> <li>■ exceptional leave benefits;</li> <li>■ bereavement benefits.</li> </ul> <p>These specific benefits are not covered by ordinary law arrangements but through an asset fund (insurance policies) and provisions recognised by EDF.</p>
<b>PPA</b>	A power purchase agreement. This type of long-term contract generally forms the basis for an IPP project (see above).
<b>Producible hydropower generation</b>	Maximum energy that hydropower facilities may produce using contributions under normal hydraulicity conditions. However, generation from hydroelectric facilities does vary, sometimes markedly, from one year to the next depending on hydraulicity (rainfall and snowfall). In dry years, the generation index may vary by 20% or more from the standard level.
<b>Profit at Risk ("PaR") (Edison)</b>	Regarding Edison, the Profit at Risk ("PaR") is, for a given confidence interval, the maximum decline of the expected value of a portfolio ("MtM") on a yearly time horizon.
<b>Radiation protection (Dosimetry - Dose)</b>	At a power plant, ionising radiation sources are numerous: the fuel itself, equipment activated by neutron flux (particularly that which is close to the core, such as tanks or lids) and particles from corrosion of the primary circuit of reactors and carried by the primary fluid. The level of exposure of a person is quantified by the dose equivalent in Sieverts (Sv). The total dose equivalents, called dosimetry and expressed in man-sieverts, is used as an indicator of dose received by all participating persons. The mobilisation of ground players has allowed a continuous improvement of performance on the protection of employees against the effects of ionising radiation.
<b>Remote metering</b>	Remote metering of the quantity of electrical power injected into and drawn from the network.
<b>Renewable energies</b>	Energies for which production does not require extinction of the initial resource. They largely derive from geothermal, water, air, fire and solar sources. They include hydro, wind, solar, marine (the energy produced by marine waves and currents), geothermal (energy derived from the heat below the earth's magma) energies, and bio-mass (energy derived from living matter, particularly wood and organic waste). They often include energy from the incineration of household or industrial waste.
<b>Reprocessing</b>	Reactor burnt fuel reprocessing aimed at separating materials that can be recycled (uranium and plutonium) from final waste.
<b>RepU (reprocessed uranium)</b>	Reprocessed uranium ("RepU"), uranium derived from spent fuel reprocessing, differs from natural uranium as it contains slightly more uranium 235 and more uranium isotopes. It is recyclable and RepU fuel assembly refuelling is commonly used in reactors.
<b>RPD</b>	French public distribution network.
<b>RPT</b>	French public transmission network.
<b>Series</b>	In the nuclear field, a series of plants means a set of nuclear plants with identical generation capacity. EDF's PWR model is divided into three series of available electrical power: the 900-MW series (34 tranches of approximately 900MW each), the 1,300-MW series (20 tranches) and the 1,450-MW series (four tranches).
<b>STEP</b>	An energy transfer pumping station (STEP) is a plant with two reservoirs, one higher and one lower, connected via pumps to push the water up and turbines to produce energy.
<b>Storage</b>	Storage consists in placing packages of radioactive waste in a facility, ensuring their long-term management, i.e., under safe conditions allowing for long-term risk control.
<b>Storage center</b>	Low- or medium-level short-lived radioactive waste from nuclear plants, from La Hague or Centraco facilities, are sent to ANDRA's Soullaines storage center in the French department of Aube, which has been operational since 1992. This centre has a capacity of 1,000,000m <sup>3</sup> , and acceptance capacity of approximately 60 years. Very low-level short-lived radioactive waste is sent to ANDRA's Morvilliers storage center (also in the Aube). This center was commissioned in October 2003 and has an operating life of about 30 years.

<b>Systems services</b>	Systems Services are services provided to users (consumers or electricity producers) through the joint action of the electricity transmission network operator RTE and the producers. They are intended to regulate frequency and voltage in order to maintain the balance between electric consumption and production at all times. They are created by RTE from elementary contributions from producers, i.e. primary and secondary reserves provided to RTE. RTE remunerates the producers for these auxiliary services before re-invoicing these services via the tariff to use the network under the rules defined by the Union for the Coordination of Transmission of Electricity (UCTE).
<b>Therms (th)</b>	One therm is equivalent to 1,163kWh or 4,186 million joules.
<b>Transmission network</b>	Network providing for the transmission of electrical power at high and very high voltages from the generating sites to the distribution networks or industrial sites directly connected to it; this includes the major interconnection transmission network (400,000 volts and 225,000 volts) and the regional distribution networks (225,000 volts, 150,000 volts, 90,000 volts and 63,000 volts).
<b>Transmission Tariff Contribution ("CTA")</b>	Contribution applied to consumer bills that covers specific benefits constituted before 2005 concerning employees who work in transport and distribution. The CTA ends in 2025 and annual payments will be made to the National Fund for the Electricity and Gas Industries ("CNIEG").
<b>Tritium (<math>^3\text{H}</math>)</b>	Hydrogen isotope, which emits beta rays, present in pressurised water reactor effluents.
<b>Ultracentrifugation</b>	This process involves very high speed spinning in a vacuum of a cylinder containing uranium hexafluoride ( $\text{UF}_6$ ). Through the effect of the centrifugal force, the heavier molecules ( $^{238}\text{U}$ ) aggregate at the periphery while the lighter ones ( $^{235}\text{U}$ ) move towards the centre, creating an isotopic separation effect.
<b><math>\text{UO}_2</math></b>	Natural uranium, fluorinated and then enriched. Uranium oxide, a particularly stable chemical form of uranium used as fissile material in fuel assemblies of pressurised water reactors.
<b>Upstream</b>	See "Fuel Cycle" and "Upstream Asset Portfolio".
<b>Upstream Asset Portfolio</b>	All assets that contribute to electrical power availability. These might be infrastructures (production plants, etc.) or their contractual equivalent long-term contracts, equity interests, contracts granting rights to a portion of the energy produced.
<b>Uranium (U)</b>	<p>In its natural state, uranium is a mix containing three main isotopes (elements whose atoms have the same number of electrons and protons, thus the same chemical properties, but a different number of neutrons):</p> <ul style="list-style-type: none"> <li>■ uranium 238, 99.3% fertile;</li> <li>■ uranium 235, 0.7% fissile;</li> <li>■ uranium 234.</li> </ul> <p>Uranium 235 is the only natural fissile isotope, a quality which justifies its use as an energy source.</p>
<b>VaR (Value at Risk)</b>	Financial indicator giving the statistical measure of potential maximum risk of loss of economic value (market value or mark to market) to a portfolio of cash flows in the event of unfavourable market movements over a certain period of time and a given confidence interval.
<b>Vitrification</b>	Process of immobilisation in a glass structure concentrated solutions of high-level waste by mixing at high temperature with glass paste.
<b>Waste</b>	<p>The nuclear generation of 1MWh of electricity (equivalent to the monthly consumption of two households) produces around 11g of total waste across all categories.</p> <p>Short-lived waste represents more than 90% of the total, but contains only 0.1% of the radioactivity of waste. Accordingly, based on their level of radioactivity, they are separated into two sub-categories: low-level waste and very-low-level waste.</p> <p>Long-lived medium and high-level waste are produced in low quantity (less than 10% of the total quantity), but they contain almost all of the radioactivity of the waste (99.9%).</p>



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# A 2012 Report by the Chairman of the EDF Board of Directors on corporate governance, internal control and risk management procedures

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## Introduction

Pursuant to Article L. 225-37 of the French Commercial Code, this report sets out:

- the corporate governance environment (the composition of the Board of Directors, the conditions under which the Board of Directors' work is prepared and performed, and the limits on the Chairman and CEO's powers), the principles and rules laid down by the Board of Directors to determine the corporate officers' compensation and the provisions governing shareholder involvement in EDF general meetings (§ 1);
- as well as the internal control and risk management procedures implemented within the EDF group (§K 2).

For the purposes of this report, the terms "EDF" or "Company" refer to Électricité de France SA.

The terms "EDF group" or "Group" refer to:

- the EDF corporation;
- its subsidiaries in the regulated sector: RTE and ERDF, which are respectively responsible for managing the energy transmission and distribution networks, for which the legal and regulatory framework (French Energy Code) provides for specific management independence

that limits the control over their activities by the parent company: "the regulated subsidiaries";

- its other directly or indirectly held subsidiaries, over which it has majority control, in or outside France<sup>1</sup>: "the controlled subsidiaries";
- its affiliates that are jointly-controlled, such as CENG and Dalkia International: "the jointly-controlled affiliates";
- affiliates in which the Group has direct or indirect minority holdings: "the shareholdings".

Note 1: the scope for the Group's consolidated financial statements is detailed in note 52 of the notes to the consolidated financial statements as of 31 December 2012 (see chapter 20 of the 2012 Reference Document).

Note 2: the information that is specific to the subsidiaries RTE and Électricité de Strasbourg is available in the reports produced by these two companies pursuant to Article L. 225-37 of the French Commercial Code. The practices and terms for exercising control may differ depending on the specific area of activity of the entities mentioned above, and will be specified as necessary throughout this report.

## 1 Corporate governance

The functioning of the Company's administration and management bodies is described in chapter 16 of the 2012 Reference Document.

### 1.1 Corporate Governance Code

EDF adheres to the AFEP-MEDEF Consolidated Code. This is the corporate governance code to which the Company refers pursuant to Article L. 225-37 of the French Commercial Code, subject to the specific provisions of the law and regulations that are applicable to EDF.

These specific provisions, which are a result of EDF being a state-owned company, and in particular the application to the Company of Law no. 83-675 of 26 July 1983 on the Democratisation of the Public Sector and Decree no. 53-707 of 9 August 1953, concern, in particular, the division of the Board of Directors into three colleges and the impact of this on the proportion of independent Board and Board committee members, the rules that determine the compensation awarded to the Chairman and CEO, the directors' 5-year terms of office and the reappointment en masse of the Board members, as well as the rules governing the appointment of the EDF Chairman and CEO and the way in which Executive Management decisions are taken and implemented in the Company.

For more details, please refer to section 16.1 and chapters 14, 15 and 16 of the 2012 Reference Document.

### 1.2 Composition and functioning of the Board of Directors

The Internal Regulations of the Board of Directors specify the principles on which the Board operates and how the Board, as well as the specialised advisory committees set up by the Board, fulfil their remits. These Regulations also stipulate the role and powers of the Chairman and CEO.

These Internal Regulations are reviewed as required, in order to take into account any changes in the law and regulations, for example.

#### 1.2.1 Composition of the Board of Directors

In accordance with Article 6 of Law no. 83-675 of 26 July 1983 on the democratisation of the public sector, 18 directors sit on the Board. The employees elect one-third of the directors. The remaining two-thirds are appointed during ordinary general meetings, following a proposal by the Board of Directors, with the exception of the directors who represent the French State, who are appointed by decree.

In accordance with Article 11 of the Law on the Democratisation of the Public Sector, members of the Board of Directors serve a five-year term of office.

The conditions under which directors may be removed from office are provided for in Article 12 of the Law on the Democratisation of the Public Sector (see section 16.2.1.2 of the 2012 Reference Document).

If a member's seat on the Board of Directors becomes vacant, regardless of the cause, the incoming director's term of office only lasts until the Board membership is next renewed en masse.

1. EDF took over Edison in 2012 and the company will progressively be incorporated in EDF's internal control and risk management system.

As of the date of this report, the Board of Directors comprises:

- 6 directors appointed by general shareholders' meetings: Henri Proglio, Chairman and CEO, Mireille Faugère, Philippe Crouzet, Michael Jay, Bruno Lafont and Pierre Mariani;
- 6 directors who represent the State: Marie-Christine Lepetit, David Azéma, Yannick d'Escatha, Julien Dubertret, François Loos and Pierre Sellal;
- 6 directors elected by employees: Christine Chabauty and Marie-Hélène Meyling, Alexandre Grillat, Philippe Maïssa, Jean-Paul Rignac and Maxime Villota.

The list of the directors' personal details is provided in section 14.1 of the 2012 Reference Document. Pursuant to Law no. 2011-103 of 27 January 2011 on the balanced representation of women and men on boards of directors and supervisory boards, and professional gender equality, EDF, in its capacity as a listed *société anonyme* and state-owned company, is subject (i) to the rules applicable to listed companies (as regards the college of directors appointed by general meetings) and (ii) to the rules applicable to public institutions (for the college of directors appointed by decree). As of the date of this report, the EDF Board of Directors has four female members (22.2% of the total Board membership), one of whom belongs to the college of directors appointed by general shareholders' meetings. The second belongs to the college of directors appointed by decree and the two others belong to the college of directors elected by the employees (see section 16.2.1.1 of the 2012 Reference Document).

Decree no. 2012-406 of 23 March 2012<sup>1</sup> appointed a Government Commissioner to the Company Board of Directors. The Government Commissioner attends Board meetings in an advisory capacity.

By Order of 15 June 2012, Pierre-Marie Abadie, Director of Energy at the Directorate General for Energy and Climate, which reports to the Minister for Ecology, Sustainable Development and Energy, was appointed Government Commissioner.

The Head of the French State's economic and financial evaluation of EDF<sup>2</sup> and the Secretary of the Central Works Council attend the meetings of the Board of Directors in an advisory capacity.

## 1.2.2 Obligations and duties of directors

The Internal Regulations of the Board of Directors provide that Board members' obligations include: acting in the interest of the Company, informing the Board of Directors of any conflicts of interest and abstaining from voting in any discussion involving a potential conflict of interest, respecting the confidentiality obligation and complying with EDF's Stock Market Compliance Charter.

The members of the Board of Directors, and the Chairman and CEO are required to inform the Board of Directors immediately of all agreements entered into by the Company in which they have a direct or indirect interest or that are entered into by an intermediary.

Each director receives a regularly updated Director's Handbook that is primarily a compendium of the Company's bylaws, the Internal Regulations of the Board of Directors and its Committees, the Stock Market Compliance Charter (see section 16.5 of the 2012 Reference Document) and the AFEF-MEDEF Code.

## 1.2.3 Executive Management method, powers and responsibilities of the Chairman and CEO

According to the EDF bylaws, the Chairman of the Board of Directors is responsible for the general management of the Company and has the title of Chairman and Chief Executive Officer (CEO).

EDF's bylaws thus stipulate that the duties of Chairman and CEO are not conferred on separate persons. The Board Internal Regulations and, in particular, the limits they place on the CEO's powers, are designed to ensure a balance of power between the executive corporate officer and the Board of Directors, while maintaining requisite flexibility and responsiveness in the administration and management of the Company.

The EDF Chairman is appointed by Presidential decree on the basis of a proposal of the Board of Directors and may also be removed from office by such a decree, in accordance with Article 10 of the Law on the Democratisation of the Public Sector.

Henri Proglio was appointed Chairman and CEO of EDF on 25 November 2009, by decree.

Subject to the specific provisions of the law relating to public sector companies and the powers that the law or the bylaws expressly reserve for the Board of Directors or shareholders' meetings, as well as the limits on the powers of the Chairman and CEO set forth in the Board of Directors' Internal Regulations as an internal rule (see § 1.2.4), the Chairman and CEO is vested with the broadest powers to act on behalf of the Company in all circumstances, within the limit of the corporate purpose. The Chairman and CEO organises and oversees the Board of Directors' work, on which he reports to general meetings. He ensures that the various corporate bodies function correctly and, in particular, verifies that the directors are able to fulfil their remits.

## 1.2.4 Powers and remits of the Board of Directors

In accordance with the law, the Board of Directors determines the Company's business policies and ensures that these policies are implemented. Subject to the powers that are expressly conferred on shareholders' meetings and within the limit of the corporate purpose, the Board of Directors may take it upon itself to review all matters that are related to the smooth running of the Company, governing such affairs through its deliberations.

Moreover, in accordance with Article 7 of the Law on the Democratisation of the Public Sector, the Board deliberates on all the Company's and the Group's strategic, economic, financial or technology policies, as well as on matters that the law expressly entrusts to the Board or that the Board has reserved for itself.

Pursuant to its Internal Regulations, solely the Board of Directors can authorise the following operations:

- acquisition-based and internal growth operations or disposals that represent financial exposure for the Company in excess of €200 million. This threshold is reduced to €50 million for acquisitions that are not consistent with the Company's strategy policies;
- real estate transactions that exceed €200 million;
- certain financial transactions for which the amount exceeds the value determined each year by a specific Board decision; for the 2012 fiscal year, the Board set (i) the total amount of the aggregate authorisation for guarantees, endorsements and sureties at €500 million (the Chairman and CEO reports to the Board on all transactions of this type for which the unit amount exceeds €100 million, which are granted on behalf of the Company or by an undertaking that is controlled by the Company) and (ii) the nominal unit amount of certain financial transactions at €5 billion;
- procurement contracts (for supplies, works or services, with or without a financial commitment) for which the amount, including that of any successive riders entered into during the same year, is equal to or higher than €200 million, or between €100 and €200 million if these procurement contracts correspond to a new Group strategic policy or business line;

1. Decree that amends Decree no. 2004-1224 of 17 November 2004 that provides for the bylaws of the *société anonyme* Electricité de France.

2. In accordance with the Decree no. 55-733 of 26 May 1955, this assignment performs the French State's economic and financial evaluation of EDF. Extended audit procedures may be performed.

- long-term contracts for the purchase or sale of energy, or CO2 emission credit and allowances, which were entered into by the Company or by a company under its exclusive control, for annual volumes or amounts in excess of:
  - 10 TWh for electricity,
  - 20 TWh for gas (detailed information on long-term contracts for the sale or purchase of gas for more than 5 TWh and less than 20 TWh is also provided during the Board meeting that follows their signature),
  - €250 million for coal and carbon dioxide;
- strategies related to nuclear fuel cycle front-end and back-end operations;
- operations to transfer obligations relating to decommissioning or the back-end of the nuclear fuel cycle.

The Board of Directors establishes the framework for the policy on the constitution and management of the assets used to cover nuclear commitments, and votes, in particular, on asset-liability management, the asset allocation strategy, the quality of the assets and the method used to select any financial intermediaries. The Board sets the market, counterparty and liquidity risk limits.

Lastly, pursuant to the Law no. 2011-103 on the balanced representation of women and men on boards of directors and supervisory boards<sup>1</sup> and professional gender equality, the Board of Directors must deliberate annually on the Company's policy on professional gender equality and equal pay.

## 1.2.5 Assessment of director independence

The AFEP-MEDEF Corporate Governance Code recommends that, in controlled companies, at least one-third of the seats on the Board of Directors should be held by independent directors. Given the specific legal framework that applies to the Company, out of a total of 18 members, the Board of Directors has 12 directors (six who represent the French state and six who represent the employees) who cannot meet the independence criteria defined by the AFEP-MEDEF Code. During the joint meeting of 8 January 2013, the Ethics Committee and the Nominations and Compensation Committee reviewed each director's individual position. On the basis of the these Committees' findings, during its meeting of 30 January 2013, the Board of Directors assessed the independence of the directors in light of the criteria defined by the AFEP-MEDEF Corporate Governance Code and confirmed that Mireille Faugère, Philippe Crouzet, Michael Jay, Bruno Lafont and Pierre Mariani qualify as independent directors. In the Board's opinion, these directors have no ties with the Company, its Group or its Management that would be liable to compromise their freedom of judgement.

As of the date of this report, the Company Board of Directors therefore has five independent directors out of a total of 18 members.

## 1.2.6 Functional assessment of the Board of Directors

In accordance with the provisions of the AFEP-MEDEF Code, the Board of Directors Internal Regulations require the Ethics Committee to perform an annual functional assessment of the Board of Directors and to suggest areas that require improvement. Consequently, once a year the Board of Directors devotes an agenda item to this assessment and discusses how the Board functions, in order to improve the Board's effectiveness, and to verify that major issues are properly prepared and discussed within the Board. Moreover, every three years, an outside consultant performs this assessment, which is overseen by the Ethics Committee.

The last assessment performed by an outside firm was conducted in 2010. In 2012, the annual assessment was performed internally using a questionnaire, then validated by the Board following a proposal by the Ethics Committee. According to the results of this assessment, which were reviewed by the Ethics Committee and presented to the Board of Directors on 30 January 2013, the directors are very satisfied with Company's implementation of corporate governance best practices. A strategy seminar and involving all Board members in the Group's strategic planning through its Strategy Committee were seen positively, as were the views on how the roles of the specialised Committees combine with that of the Board of Directors.

## 1.2.7 Director information and training

In accordance with the Board of Directors' Internal Regulations, the directors periodically receive information on the Company's and the Group's financial position, cash flow and commitments, as well as data such as the financial outcome of contracts awarded by the Company for the purchase of nuclear fuels, a performance review of the Company's main subsidiaries when the annual and half-yearly financial statements are released, the customer policy, the procurements and sub-contracting policy and the human resources policy.

A document that focuses on current affairs in the Group's major areas of business, market trends, the economic, financial and institutional environment is prepared for each Board meeting.

Directors are informed of the main events involving the Company that occur in between Board meetings, as well as the follow-up on decisions taken by the Board.

The directors may supplement this information by meeting with senior managers from the Company or Group.

Moreover, informational meetings are held on complex matters or matters of major strategic importance, as well as areas in which the directors wish to receive training.

## 1.3 Board activity in 2012

The Board of Directors meets as often as the interest of the Company requires, in accordance with the provisions of the law and regulations. During the 2012 fiscal year, the Board of Directors met nine times and 27 committee meetings were held in order to prepare these meetings. The Board also held a strategy seminar.

On average, Board meetings lasted two-and-a-half hours, which allowed for an in-depth review and discussion of the agenda items.

The directors' average attendance rate at Board meetings was 89.5% in 2012.

In 2012, in addition to the numerous matters associated with the day-to-day running of the Company, the Board of Directors reviewed and authorised major courses of action, such as:

- acquiring exclusive control of the Italian company Edison;
- the sale of the Sutton Bridge plant (United Kingdom) in accordance with the commitment EDF made to the European Commission, as part of the acquisition of British Energy at the end of 2008.

Moreover, during a strategy seminar, the Board reviewed the consequences for the Group of changes in the energy sector and the positions of market participants, potential avenues for development and the financial trajectory.

1. See section 16.2.1 of the 2012 Reference Document.

## 1.4 Committees that report to the Board of Directors

For the performance of its remits, the Board of Directors is assisted by five committees, which are tasked with reviewing and preparing specific files, prior to their presentation to the full Board. These specialised committees are: the Audit Committee, the Nuclear Commitments Monitoring Committee, the Strategy Committee, the Ethics Committee and the Nominations and Compensation Committee.

The membership, functioning and remits of the Committees are governed by the Board of Directors Internal Regulations.

The Board of Directors selects the directors who sit on these Committees. The Board appoints the Chairman of each Committee following a proposal by the members of the Committee concerned.

The Government Commissioner attends Board meetings in an advisory capacity.

The Head of the French State's economic and financial evaluation of EDF is invited to attend committee meetings.

The Committees' work is organised within the framework of an annual programme. Meetings are recorded in written minutes. Each committee chairman provides written reports to the Board of Directors.

### 1.4.1 Audit Committee

#### 1.4.1.1 Functioning and composition

The Audit Committee fulfils the remits conferred on it in accordance with the provisions of Order no. 2008-1278 of 8 December 2008, which transposed the eighth European Directive of 17 May 2006 on statutory audits of annual accounts and consolidated accounts into French law.

Article L. 823-19 of the French Commercial Code provides that at least one member of the Audit Committee must have specific financial or accounting skills, and be independent on the basis of criteria that are specified and made public by the Board of Directors.

During the joint meeting of 14 January 2011, the Ethics Committee and the Nominations and Compensation Committee reviewed Pierre Mariani's position and issued an opinion that was presented to the Board of Directors. During the Board meeting of 21 January 2011, the directors noted that Mr. Mariani has specific financial and accounting skills, as per the criteria recommended by the French financial markets authority (*Autorité des marchés financiers* – AMF) in its report on the Audit Committee dated 22 July 2010, and that he meets both the skills and independence criteria, in accordance with Article L. 823-19 of the French Commercial Code (see § 1.2.5).

More generally, all the Audit Committee members contribute to the quality of Committee discussions through their experience and skills.

The Audit Committee is chaired by Pierre Mariani, an independent director appointed by the general shareholders' meeting and a respected figure from outside the EDF group. The other members are David Azéma and Yannick d'Escatha, two directors who represent the French state, along with Marie-Hélène Meyling, Alexandre Grillat and Maxime Villota, three directors who were elected by the employees.

David Azéma was appointed as Audit Committee member by the Board meeting of 22 November 2012. He replaces Jean-Dominique Comolli.

The membership of the Company Audit Committee reflects the specificities of the Board of Directors' membership caused by the Law of 26 July 1983 on the Democratisation of the Public Sector, which makes it difficult to comply with the proportion of two-thirds of independent directors recommended by

the AFEF-MEDEF Code. However, in the Company's opinion, although two-thirds of the Audit Committee members are not independent directors, its current membership does not adversely affect the Committee's competencies or its ability to effectively perform the assignments conferred on it by the law and the Board Internal Regulations.

The Chairman and CEO attends the Committee meetings that review the annual and half-yearly financial statements, the medium-term plan and the budget.

The Audit Committee met seven times in 2012. The average rate of attendance for directors who are members of this Committee was 85.7%.

#### 1.4.1.2 Remits

Prior to review by the Board of Directors, the Audit Committee analyses and issues an opinion on:

- the Company's financial position;
- the medium-term plan and the budget;
- the draft financial reports prepared by the Corporate Finance Division (parent company financial statements, Group consolidated financial statements and Group management report);
- the monitoring of the Company's risks (in particular, this Committee reviews the Group's risk mapping and risk mitigation methods every six months);
- audit and internal control: the organisation, deployment and assessment of internal control, half-year audit programmes, main findings and resulting corrective measures, follow-up on their implementation, as well as the draft annual report by the Chairman of the Board of Directors on corporate governance, internal control and risk management procedures;
- the insurance policy strategy;
- the selection of Statutory Auditors, while ensuring their independence, and the fees paid to them;
- the review of the financial aspects of external growth operations or disposals that are particularly significant in nature (see § 1.2.4);
- changes in analysts' perception of the Group.

As part of its work, the Committee is in regular contact with the Statutory Auditors and the Executive Management, as well as the Corporate Finance, Corporate Risk Management and Internal Audit Divisions.

#### 1.4.1.3 Activities in 2012

In 2012, the Audit Committee reviewed matters that specifically fall within the bounds of its remits (half-yearly and annual financial statements and related press releases, press releases on the quarterly sales figures, risk mapping, internal audit summary reports and the audit programme).

It also reviewed the consequences of taking over Edison for the Group's financial statements.

### 1.4.2 Nuclear Commitments Monitoring Committee

#### 1.4.2.1 Functioning and composition

The Nuclear Commitments Monitoring Committee is chaired by Philippe Crouzet, an independent director appointed by the general shareholders' meeting and a respected figure from outside the Group. The other committee members are Marie-Christine Lepetit and Yannick d'Escatha, two directors who represent the French State, and Marie-Hélène Meyling and Maxime Villota, two directors who were elected by the employees.



Marie-Christine Lepetit was appointed as member of the Nuclear Commitments Monitoring Committee by the Board meeting of 24 May 2012, as a replacement for Pierre-Marie Abadie.

The Nuclear Commitments Monitoring Committee met three times in 2012. The average rate of attendance by directors who are members of this Committee was 86.7%.

#### 1.4.2.2 Remits

The Nuclear Commitments Monitoring Committee is tasked with monitoring changes in nuclear provisions, commenting on governance issues related to dedicated assets, the rules for matching assets and liabilities and on strategic allocation, and ensuring the compliance of EDF's asset management within the framework of the policy on the constitution and management of dedicated assets. To this end, it can call on the support of the Nuclear Commitments Financial Expertise Committee (CEFEN), which comprises six<sup>1</sup> independent experts. The CEFEN's remit is to assist the Company and its governance bodies in this area.

#### 1.4.2.3 Activities in 2012.

In 2012, the Committee reviewed, in particular as part of the policy on the constitution and management of dedicated assets, the state of progress of the project for the disposal of high-level waste and long-lived intermediate-level waste (HLW/ILW-LL), and the 2012 update letter on the second three-year report on securing the financing of nuclear expenses (see § 2.3.3.1).

### 1.4.3 Strategy Committee

#### 1.4.3.1 Functioning and composition

Henri Proglio, the Chairman and CEO, chairs the Strategy Committee. The other members are Michael Jay, an independent director appointed by the general shareholders' meeting and a respected figure from outside the Group, Marie-Christine Lepetit, David Azéma and Pierre Sellal, three directors who represent the French State, along with Marie-Hélène Meyling, Alexandre Grillat and Jean-Paul Rignac, three directors who were elected by the employees.

Marie-Christine Lepetit was appointed as a Strategy Committee member by the Board meeting of 24 May 2012, as a replacement for Pierre-Marie Abadie.

David Azéma was appointed as a Strategy Committee member by the Board meeting of 22 November 2012, as a replacement for Jean-Dominique Comolli.

Since 2010, the Chairman has invited directors who are not members to attend Strategy Committee meetings, so that the Board of Directors is more involved in strategic discussions.

The Strategy Committee met five times in 2012. The average rate of attendance by directors who are members of this Committee was 90%.

#### 1.4.3.2 Remits

The Strategy Committee issues an opinion to the Board of Directors on the Company's major strategy policies, in particular the strategic development plan, the industrial and commercial policy, the Public Service contract, strategic agreements, alliances and partnerships, the research and development policy, external or internal growth or disposal projects that require authorisation from the Board of Directors.

#### 1.4.3.3 Activities in 2012

In 2012, the Strategy Committee reviewed in particular the implications of the complementary security assessments for EDF and EDF Energy's nuclear fleets, the Group's renewable energies strategy, as well as, during a joint meeting with the Ethics Committee, the Group's human resources policy and EDF's professional gender equality and equal pay policy.

### 1.4.4 Ethics Committee

#### 1.4.4.1 Functioning and composition

Mireille Faugère, an independent director who was appointed by the general shareholders' meeting and a respected figure from outside the Group, chairs the Ethics Committee. The other members are Marie-Christine Lepetit, one of the directors who represent the French State, along with Christine Chabauty, Marie-Hélène Meyling, Alexandre Grillat and Philippe Maïssa, four directors who were elected by the employees.

Marie-Christine Lepetit was appointed as a member of the Ethics Committee by the Board meeting of 24 May 2012, as a replacement for Pierre-Marie Abadie.

The Ethics Committee met nine times in 2012. The average rate of attendance by directors who are members of this Committee was 81.1%.

#### 1.4.4.2 Remits

The Ethics Committee ensures that ethical considerations are taken into account in the work of the Board of Directors and in the management of the Company. The Committee reviews the reports filed by the Mediator, the General Inspector of Nuclear Safety and Radioprotection, the Inspector of Hydro Safety and the General Inspector of Regulated Activities Governance.

Moreover, each year the Ethics Committee oversees an assessment of how the Board and its Committees function. Every three years, this is entrusted to an outside consultant (see § 1.2.6).

Moreover, the Committee periodically visits operations sites in order to understand the matters that fall under its authority.

#### 1.4.4.3 Activities in 2012

In 2012, among other things, the Ethics Committee studied the draft Group Ethics Charter, the Group Health and Safety Policy, the Group's communication and sponsorship policies and, during a joint meeting with the Strategy Committee, the Group's human resources policy and EDF's professional gender equality and equal pay policy.

### 1.4.5 Nominations and Compensation Committee

#### 1.4.5.1 Functioning and composition

Bruno Lafont, an independent director appointed by the general shareholders' meeting and a respected figure from outside the Group, chairs the Nominations and Compensation Committee. The other members of the Committee are Michael Jay, an independent director appointed by the general shareholders' meeting and a respected figure from outside the group and David Azéma, one of the directors who represent the French State.

David Azéma was appointed as an Nominations and Compensation Committee member by the Board meeting of 22 November 2012, as a replacement for Jean-Dominique Comolli.

The Nominations and Compensation Committee met three times in 2012. The average rate of attendance by directors who are members of this committee was 88.9%.

#### 1.4.5.2 Remits

The Nominations and Compensation Committee submits proposals to the Board of Directors with a view to directors being appointed by the general shareholders' meeting. The committee sends the Minister responsible for the economy and finance, and the Minister responsible for energy, an opinion, for approval, on the salary, variable compensation (criteria used to determine the variable portion and assessment of the results obtained compared to the targets set), and peripheral compensation of the Chairman and CEO. It

1. Appointed by the Board of Directors on 26 October 2010 for three years.

also sends this opinion to the Board of Directors, with a view to the Board discussing and determining these compensation components.

Where applicable, the committee reviews the compensation paid to Vice-Presidents. It provides an opinion to the Board of Directors on the conditions for establishing the compensation of the principal senior executives (fixed and variable components, calculation method and indexing), as well as on the amount and conditions for allocating the directors' fees. The Committee ensures that succession plan charts exist for positions on the Executive Committee.

### 1.4.5.3 Activities in 2012

In 2012, among other matters, the Nominations and Compensation Committee reviewed the variable component of the Chairman and CEO's compensation in respect of 2011 and his gross annual compensation, as well as the criteria used to calculate his variable compensation in respect of 2012 (see section 15.1 of the 2012 Reference Document).

## 2 EDF Group internal control

The purpose of this report is not to give an exhaustive presentation of all the control procedures that exist within the Group's companies, but to emphasise the control procedures that concern activities or risks that are deemed to be significant, as well as the main long-term procedures in effect in 2012, highlighting any changes and key initiatives developed during that year. These internal control and risk management procedures are consistent with the general principles stipulated in the AMF Reference Framework for risk management and internal control<sup>1</sup> (published on 22 January 2007 and updated on 14 June 2010).

### 2.1 Control environment

#### 2.1.1 Executive Management steering structures

EDF's Executive Management is organised in line with two major policies: improve functioning as an integrated Group while respecting the management autonomy of the regulated subsidiaries and reinforce the role of the operating teams in the decision-making process.

#### Executive Committee

The Chairman and CEO is supported by an Executive Committee comprising representatives from all the Group's business lines, together with representatives from corporate finance, legal affairs and human resources.

The Executive Committee membership was as follows as of the date of this report:

- Henri Proglio, Chairman and CEO, Chairman of the Executive Committee;
- Marianne Laigneau, EDF Group Senior Executive Vice President, Human Resources;
- Henri Lafontaine, Group Senior Executive Vice President representative, Customers, Optimisation, Trading and IES (Island Energy Systems);
- Pierre Lederer, Special Advisor to the Chairman;
- Hervé Machenaud, Group Senior Executive Vice President, Generation and Engineering;
- Thomas Piquemal, Group Senior Executive Vice President, Finance;
- Vincent de Rivaz, Chief Executive of EDF Energy; and
- Alain Tchernonog, General Secretary.

1. In preparing this report, EDF used the AMF Reference Framework (chapters 2.3.1 to 2.3.4), which is based on the Committee of Sponsoring Organizations of the Treadway Commission ("COSO") reference framework (chapters 2.1 to 2.5).

### 1.5 Compensation

The terms for setting EDF corporate officers' compensation, the principles and rules established by the Board of Directors for determining this compensation and the amounts paid to directors in 2012, are detailed in chapter 15 of the 2012 Reference Document.

### 1.6 Shareholders' meetings

The rules governing shareholder involvement in general meetings are set out in article 20 of the Company bylaws, and are described in section 21.2.7 of the 2012 Reference Document.

Moreover, the information provided for by Article L. 225-100-3 of the French Commercial Code is published in the Company's Reference Document.

Denis Lépée, Advisor to the Chairman, is the Secretary to the Executive Committee.

This Committee is a forum for reflection, discussions on strategy and consultation on the Group's crosscutting issues. It monitors the targets and operating results, and contributes to the management and anticipation of the EDF group's major strategic challenges. The Committee reviews and approves major projects and, in particular, Group investment or divestment projects for which the amounts exceed certain thresholds. The Executive Committee meets weekly.

#### Commitments Committee within the Group Executive Committee

A Commitments Committee performs in-depth reviews of planned commitments for the Group (excluding regulated subsidiaries) to which the Executive Committee is, in principle, favourable, prior to the Commitments Committee making a final decision. Projects that receive a favourable opinion are monitored. No Company investment project can be submitted to the Board of Directors for review without first being approved by this Committee.

#### Management Committee

In 2010, the Executive Management organisation was complemented by the creation of a Management Committee. The Executive Committee members also sit on the Management Committee, along with the Group's top international executives and the heads of geographical regions, the Chairman of the ERDF Management Board and Directors of Company support functions. The membership was as follows as of the date of this report:

- Michèle Bellon, Chair of the ERDF Management Board;
- Jean-Paul Bouttes, Senior Executive Vice President, Corporate Strategy and Prospective;
- Antoine Cahuzac, CEO, EDF EN;
- Catherine Gros, Group Senior Executive Vice President, Communications;
- Philippe Huet, Associate General Secretary, Senior Executive Vice President, Risks and Audit;
- Bruno Lescœur, Senior Executive Vice President representative, Gas and Southern Europe;
- Philippe Méchet, Senior Executive Vice President, Institutional Relations;
- Olivier Orsini, Senior Executive Vice President, Development in South America, Africa, the Middle East and the Community of Independence States (CIS) and associated partnerships;

- Bernard Salha, Senior Executive Vice President, Research and Development;
- Eric Thomas, Group General Counsel;
- Gérard Wolf, Senior Executive Vice President, responsible for relations with the Washington-based international financial institutions.

The Management Committee brings together business line, geographical and functional expertise. It is a forum for discussion between the Group's top executives on crosscutting matters. It provides support to the Company's Executive Management for strategy implementation and steering synergies within the Group. This Committee meets monthly.

### General Inspector of Nuclear Safety and Radioprotection

The General Inspector of Nuclear Safety and Radioprotection, who is appointed by and reports to the EDF Chairman and CEO, is tasked with conducting audits in his or her spheres of action and issuing an annual opinion on the overall safety of the Group's nuclear power stations. The remit also includes making proposals to Executive Management regarding potential areas for improvement.

### EDF Group Inspector of Hydro Safety

The EDF Group Inspector of Hydro Safety, who is appointed by and reports to the EDF Chairman and CEO, is tasked with conducting audits in his or her spheres of action and issuing an annual opinion on the overall safety of the Group's hydroelectric plants. The remit also includes making proposals to Executive Management regarding potential areas for improvement.

## 2.1.2 Description and leadership of the internal control system

The Chairman and CEO signed off on a new decision relating to the implementation of internal control within the EDF group on 3 September 2010. This decision takes into account, in particular, the provisions of the Order of 8 December 2008 on statutory audits of financial statements and specifies the EDF group's internal control policies. It aims to provide a reasonable assurance of risk management at EDF, with a view to ensuring constant improvement, by using the following key principles as a foundation:

- delegated accountability to each of the Group's executives who, at every level, are responsible for:
  - managing the principal risks,
  - checking this management for the activities they have sub-delegated,
  - ensuring that the risks identified have the appropriate, proportionate control procedures in place,
  - self-assessing the procedures thus implemented and reporting regularly and formally on these procedures to their line managers;
- an audit procedure, with reporting to the Chairman and CEO, as described in § 2.1.3.2.

These key principles apply to all the Group's entities, although the implementation conditions may vary depending on the entities concerned (size, governance conditions and level of control).

Within the control scope (excluding regulated subsidiaries), these principles are implemented by the Executive Management functions at the subsidiaries that they control and in the main EDF Operating Divisions, which themselves control several operating units or subsidiaries.

Each executive concerned has appointed an "Internal Control Coordinator". The Corporate Audit Division organises this network of coordinators (around 80 persons).

An Internal Control Manual<sup>1</sup> has been written and is offered to each entity as a standard for the implementation of its own internal control system. This manual describes the risk areas concerned, identifies the main aims of control to be explored and suggests the best practices to be adopted. It is updated annually to take into account feedback and new control requirements. The 2012 manual took into account, in particular, a new regulatory requirement concerning the transparency and integrity of the wholesale markets for energy.

At the end of 2012, each of the 57 entities concerned produced an annual report on internal control that includes a description of their internal control system, a self-assessment<sup>2</sup> of this system and a statement by the head of the entity on commitment to internal control and an account of the intended measures to achieve these aims. This is the sixth consecutive year that the Group has commissioned this report. Each year a summary of these documents and how they could be interpreted in terms of internal control deployment in the Group is provided to the Chairman and CEO and the Audit Committee, then to the Board of Directors.

The Audit Division now performs full audits on these entities, which include a review of the robustness of their internal control, at the same frequency as previously (3 to 5 years depending on their size).

Concerning the other Group subsidiaries (regulated subsidiaries, and significant shareholdings), risk control is the responsibility of EDF's representatives within the governance bodies. For each subsidiary, these representatives are responsible for implementing risk mapping, producing a description of the internal control and audit systems and providing regular information on risk mapping and the audit activities (audit programme and main findings), as well as verifying the effectiveness and the relevance of each of these systems through periodic audits<sup>3</sup>.

The Corporate Audit Division and the Corporate Risk Management Division provide support for:

- EDF representatives within its major subsidiaries, to help them implement and manage the initiative within governance bodies;
- heads of the Divisions to which they report, who are tasked with providing the same level of support to the EDF representatives within subsidiaries of lesser importance within their area of responsibility, and reporting back on this in their annual self-assessment reports.

## 2.1.3 The contribution to internal control by the Corporate Risk Management Division, the Group Audit function, the Finance Division and the Legal Affairs Division

### 2.1.3.1 Corporate Risk Management Division (DCRG)

For many years, EDF has implemented a policy for managing its operating (e.g. industrial, environmental and health), financial and organisational risks.

Over and above these sector-specific policies, in response to a constantly changing environment, back in 2003 EDF decided to establish an overarching process for managing and controlling its risks with the aim of improving existing procedures, in particular by creating the Corporate Risk Management Division, which is primarily responsible for:

- ensuring that each Group entity carries out risk mapping, either directly for the EDF scope and that of the controlled subsidiaries, or through the governance bodies for the regulated subsidiaries and jointly-controlled affiliates, and establishing and updating the consolidated risk mapping of the Group's major risks (see § 2.2.2);
- warning the Chairman and CEO and the Executive Committee of emerging risks and risks that have not been adequately identified;

1. In preparing this report, EDF used the AMF Reference Framework (chapters 2.3.1 to 2.3.4), which is based on the COSO reference framework (chapters 2.1 to 2.5).  
2. Self-assessments report on all the areas of action mentioned in the AMF Reference Framework.  
3. For regulated subsidiaries, these responsibilities are exercised within the limits laid down by the regulations in force.

- consolidating the deployment of the risk control policy, either directly within the EDF scope and that of the controlled subsidiaries, or through the governance bodies for the regulated subsidiaries and jointly-controlled affiliates (see § 2.2) in particular by ensuring the comprehensiveness and consistency of the various sectoral risk control policies (see § 2.3.1.1);
- ensuring the deployment of the energy market risk policy within the EDF scope and that of the controlled subsidiaries and, more generally, ensuring the control of these energy market risks either directly within the EDF scope and that of the controlled subsidiaries, or through the governance bodies for the regulated subsidiaries and jointly-controlled affiliates (see § 2.3.1.1.1);
- defining and implementing financial risk control (interest and currency exchange rates, liquidity and equities risks) and counterparty risk control for the EDF scope and that of the controlled subsidiaries and ensuring the control of these financial risks through the governance bodies, for the regulated subsidiaries and jointly-controlled affiliates (see § 2.3.1.1.2);
- managing the comprehensiveness and relevance of the risk analyses performed on long-term investment and commitment projects, which are submitted to Executive Committee-level bodies for approval;
- ensuring the deployment of the crisis management policy for the EDF scope and that of the controlled subsidiaries, and defining the terms of exchange and cooperation with regulated subsidiaries or the jointly-controlled affiliates during periods of crisis and guaranteeing the operational readiness of the crisis management system at Group level (see § 2.2);
- at the request of the General Secretariat, the Group Executive Commitments Committee, the Procurements Division and the Group business lines or subsidiaries management, performing the various controls that are required for managing non-financial risks linked to business relations in connection with long-term investments and commitments, partnerships, consultancy contracts or the award of sensitive procurement contracts by EDF SA.

### 2.1.3.2 **Group Audit function**

The Group Audit function is made up of all the audit resources of the Group, EDF and the subsidiaries that perform internal audit activities. The Chairman and CEO has entrusted the management of this function to the Senior Vice President, Risks and Audit. The audit function includes the Corporate Audit Division and dedicated “operations” audit teams: “business line” audit teams (in the generation and customer areas, as well as the Asia-Pacific zone for EDF) and audit teams that are specific to each of the main French and international subsidiaries and affiliates (RTE, ERDF, EDF Énergies Nouvelles, EDF Energy and EDF Trading, Edison, and EDF Luminus, formerly SPE).

The relationships between Corporate Audit and the various audit teams, along with their respective prerogatives, take into account the fact that they are part of teams at EDF, the controlled subsidiaries or the regulated subsidiaries. Corporate Audit is responsible for the operational coordination of the function (joint appointment and joint assessment of business line Audit Directors –excluding RTE and ERDF – exchanges of best practices, training initiatives, pooling tools and methods).

### **Qualification standards concerning EDF and the controlled subsidiaries**

- The Corporate Audit Division applies international standards as defined by The Institute of Internal Auditors and ensures that these standards are promoted and upheld within the scope of control.
- The duties, powers and responsibilities of the auditors, as well as the rights and duties of the audited entities, are defined in a charter that was updated on 3 September 2010. This charter, which was signed by the Chairman and CEO, highlights the independence of the audit function and outlines the missions and commitments of the internal audit function, together with the duties and the prerogatives of auditors and audited entities.
- The Corporate Audit Division reports to the General Secretary, while the Senior Vice President, Corporate Audit, also benefits from direct access to the Chairman and CEO.

- All the Auditors in the Corporate Audit Division and the Audit departments of EDF and its controlled subsidiaries (excluding the regulated subsidiaries) are trained to use the same methodology, which is consistent with international standards. They are recruited from EDF’s various business lines, as well as from external audit firms. Each auditor is assessed at the end of each mission and a transfer to audit is considered a positive career move. A memorandum of understanding was signed to this effect in March 2006 between the Corporate Audit Division and the EDF Senior Executive Development Division.
- The key processes that are essential to the proper functioning of the Corporate Audit Division throughout the chain of its activities (from the drawing up of audit programs to the monitoring of the implementation of recommendations) are outlined and overseen.

The audit function underwent an outside assessment in 2008, then in 2011-2012, which attested to compliance with professional standards.

### **Standards of functioning with regard to EDF and the controlled subsidiaries**

- The Corporate Audit Division coordinates the deployment of the Internal Control Policy and the internal control function, ensures the audit of the internal control procedures in the various divisions and controlled subsidiaries, and conducts both crosscutting and corporate-level audits.
- The Chairman and CEO signs off on the audit programme. The programme is then reviewed by the EDF Audit Committee, which reports back to the Board of Directors. The audit programme takes into account:
  - the need to audit, at intervals adapted to their size, the Group’s main entities (divisions and subsidiaries), in order to assess, in particular, the robustness of the internal control system;
  - the main accounting and financial processes;
  - major projects;
  - the major risks identified in the risk mapping, which are not covered by the above audits;
  - the monitoring decisions taken by Executive Management.
- The plan for the business line audit teams is coordinated with that of the Corporate Audit Division, which is the only structure that is authorised to perform business line audits that involve a corporate-level risk.
- All audits give rise to recommendations, which, after being approved by the audited entities and their management, form the basis for action plans on their part and are submitted to the Corporate Audit Division. During the 12 to 18 months following the audit, the Corporate Audit Division monitors the implementation of these corrective actions or any other action decided on by the management with the aim of eradicating the dysfunctions identified by the audit. An audit is only considered to have reached a satisfactory conclusion when these dysfunctions have been eliminated. In contrast, an unsatisfactory conclusion to an audit or one where reservations are expressed triggers an appropriate management alert.
- These principles are applied by the entire audit function under the same terms.
- The Corporate Audit Division issues half-yearly summary reports, which resume, for the entire scope of the Group audit function, the main audit findings and the corresponding recommendations, as well as the results of audits concluded during the period. It also identifies possible recurring or generic problems that appeared over the course of several audits conducted during the period, which warrant particular attention of the management. This report is presented first to the Chairman and CEO, then to the Audit Committee and the Board of Directors.

### 2.1.3.3 **Corporate Finance Division**

The Corporate Finance Division monitors changes that affect the markets and financial techniques, and also analyses project financial risks. Within the Corporate Finance Division, the Group Control Division is split into three



sections, Management Control, Accounting and Tax. Management Control has the following remits:

- manage the forecasting processes for the Group's management cycle (budgets, forecast updates and medium-term plans), summarise these processes and proposes trade-offs at Division and subsidiary level for the Group as a whole. In its analyses, Management Control is required to issue warnings and make proposals, before decisions are taken, regarding the financial consequences of the contemplated transactions, or the proposed performance levels;
- assist operations management in performance steering: tracking of budget implementation (for which forecast adjustments are issued twice a year, as well as a monthly reporting package that covers the results achieved to date and update of the most recent forecast adjustment) is tracked through regular, general performance reviews within the Division and controlled subsidiaries;
- perform the financial control function for the Group, by contributing, in particular, to the investment control processes and by performing economic and financial optimisation analyses;
- be the driving force behind the preparation of medium- and long-term financial trajectories.

The Finance Management Heads of the Divisions and subsidiaries sit on the Management Committees of the entities to which they are assigned. They are appointed and assessed by the operations management and the Management Control service line.

Accounting has the following remits:

- prepare and publish the EDF parent company financial statements, as well as the Group's consolidated financial statements;
- ensure the quality of accounting by designing a set of Group standards that detail the accounting practices and chart of accounts to be applied;
- update, for EDF, the internal control standards concerning the management of accounting and financial information.

Moreover, the accounting Internal Control policies for the subsidiaries are the responsibility of each legal structure concerned.

Tax has the following remits:

- guarantee the consistency of tax policies within the Group;
- ensure the proper performance of legal and filing obligations, in particular by monitoring changes in legal and regulatory obligations;
- track deferred tax positions in the accounts, as well as periodic justification of the accounts;
- identify and reduce Group tax risks.

### 2.1.3.4 Legal Affairs Division

In addition to the contribution to the Group's internal control made by the Legal Affairs Division outlined in paragraphs 2.1.4 and 2.3.3, since 2007 EDF has kept a contract library in order to guarantee the level of knowledge and control over its sensitive contract archives. This contract library, which is an integral part of the internal control system, is a secure information system for the centralised archiving and scanning of the major contractual commitments of EDF and certain subsidiaries (excluding the regulated subsidiaries and jointly-controlled affiliates). This system was complemented by a new decision and a practical memorandum on the management of major contracts, which the General Secretary signed on 11 January 2011. Pursuant to this decision, the original counterparts of major contracts that meet certain specific criteria are centralised in a secure national storage facility.

Since 2010, Legal Affairs has tasked a knowledge manager with capitalising on, harmonising and sharing the Legal Affairs Division's precedents and positions, as well as monitoring legal developments in the field of legislation and case law that are of major interest for the Group.

Lastly, quarterly Legal Affairs reporting (for EDF and major subsidiaries), concerning litigation and major or sensitive cases, has been in use since it was introduced in 2010.

## 2.1.4 Delegations of powers and technical authorisations

The Chairman and CEO delegates some of his powers to the Board of Directors, in particular to certain members of the management team.

In the area of procurements, the existing organisation is designed to ensure control is maintained over purchases. Based on a series of thresholds, procurement contracts are signed by the Chairman, a Group Senior Executive Vice President or one of their delegated representatives after being approved by the Senior Vice President, Purchasing, or his or her delegated representatives; this approval confirms that the contract complies with the procurement process. Each Group Senior Executive Vice President must also reinforce the internal control procedures on procurement contracts that are submitted for his or her signature and those handled directly by their respective divisions.

The powers conferred on the "nuclear operator's representative" are delegated to the Senior Executive Vice President, Generation and Engineering, who, in turn, delegates to the Senior Vice Presidents in charge of the Nuclear Operations and Nuclear Engineering Divisions.

Each facility head, subject to prior evaluation of the appropriate skills, issues the technical authorisations allowing individuals to work in the facilities (power plants, electricity transmission networks, etc.). These requirements apply to all workers, be they employees of EDF or external service providers.

The Legal Affairs Division drafts and/or updates delegations of powers where required by changes to EDF's organisation.

In addition, a delegations of powers handbook written by the Legal Affairs Division, which was released for the first time in November 2008, has been updated and was re-released in 2010. This handbook is designed as a tool for informing and raising awareness at EDF entities on the nature, consequences and management rules for delegations of powers.

## 2.1.5 Ethics and Environmental Quality Initiatives

### 2.1.5.1 Ethics initiative

The Ethics Initiative, which is founded on a decision by the Chairman and CEO taken on 15 March 2007, is based on a reference document, known as the Ethics Handbook, which summarises EDF's five core values: respect for the individual, environmental responsibility, striving for excellence, a commitment to the community and the necessity of integrity. This document was circulated within all EDF divisions by line management. The appointment of ethics coordinators to promote the Handbook and encourage proper respect of the core values in the field has improved the existing ethics system<sup>1</sup>. EDF's values serve as guidelines for ethical procedures in the subsidiaries, for the codes of conduct developed in the business lines and certain areas, as well as for fundamental processes such as recruitment (recruitment standards), training (employee awareness initiatives), relations with suppliers and subcontractors (supplier charter, social agreements on subcontracting), as well as individual and collective performance reviews (individual appraisals and managerial reviews).

In 2011, the Group decided to hold a consultation on a new set of ethics standards, which consolidates the previous values into three key tenets: respect, responsibility and solidarity at Group level. After the Group Executive Committee validated the substantive aspects on 19 October 2011, the project was tested during the first half of 2012 on groups of employees in the Group's main companies. The resulting new document was validated by the Group Executive Committee on 26 September 2012 and approved by the Board of Directors Ethics Committee on 8 October 2012.

Since its creation in 2008, the existence of a Group Sustainable Development Committee comprising the Sustainable Development managers from the various subsidiaries such as EDF Energy, EDF Démász, the EDF group subsidiaries in Poland, China and South-East Asia, and Edison has made it possible to harmonise ethics policies. The presentation to this Committee on 23 November 2012 of the new standards is the first stage in a deployment

1. Managing fraud risk is an integral part of the Internal Control Guide; this point is also covered in all entity audits and was included in a general audit in 2012.



that must ensure, over the course of 2013 and in line with the ethics initiatives of each of the Group's companies, that all employees share the ethics commitments and values.

The ethics whistleblowing procedure, which has been established since 2004 within the EDF perimeter, recognises every employee's right to report confidentially, but not anonymously, situations that are contrary to the Group's ethics rules and values. This system allows for matters to be referred to the EDF Group Ethics and Compliance Officer through a secure ethics email system. It was enhanced in 2008 with the introduction of an anonymous, toll-free number, which enables all employees to report any work-related difficulties encountered to external counsellors. On 24 November 2011, the French Data Protection Agency (CNIL) formally approved the EDF whistleblowing system described above, which handles around fifty cases a year.

Since 2010, the EDF Group Ethics and Compliance Advisor's report has been included in the corporate social responsibility management review.

## 2.1.5.2 Environmental Quality Policy

For many years, the EDF group has taken into account the strategic issues associated with sustainable development, and has made Sustainable Development a fully-fledged component of its overarching strategy. This Group policy was materialised by the signature in 2009 of a document containing a series of shared commitments by senior executives from the Group's principal companies. These commitments provide a framework to facilitate consistency between the initiatives taken by these companies and are built around three priorities:

- combating climate change and protecting biodiversity;
- giving everyone access to energy and developing local action links;
- contributing to the debate on sustainable development.

The EDF Group Sustainable Development Committee coordinates the implementation of these commitments.

This Committee acts as an Environment Board at Group level, and is in charge of steering the Environmental Management System in compliance with ISO 14001, inasmuch as the EDF group has been ISO 14001 certified since 9 April 2002.

The certification scope includes EDF (all its operating entities and most of its functional entities), a number of French subsidiaries (including the RTE and ERDF regulated subsidiaries) as well as numerous international subsidiaries, including EDF Energy. Moreover, some jointly-controlled affiliates are also ISO 14001 certified (but are not currently part of the Group certification scope). In April 2011, the Afnor independent certification body announced the third ISO 14001 renewal for the EDF Group. This certification is valid until 2014. The annual audit in March 2012 noted a stronger response, with a "Corporate Responsibility" approach that gives greater perspective and meaning to environmental action.

The processes implemented within the framework of this certification help strengthen the management of the Group's environmental risks, the regulatory aspect of which is undergoing continual improvement, and gives our stakeholders the assurance of a structured organisation, which is tangible proof that the Group's commitment to environmental protection is an acknowledged reality.

## 2.1.6 Organisation and steering of the Information Systems (IS)

Each Company and Group entity (Divisions or subsidiaries) has project ownership responsibilities for its specified scope. The Group Information Systems Division is responsible for infrastructures and shared services. Depending on the policies adopted and in liaison with each Division, project management responsibilities are shared between the division concerned and the IT and Telecommunications Shared Services Division, which acts as a cross-functional operator for EDF and the subsidiaries, including the regulated subsidiaries.

The Information System (IS) for the finance perimeter is used by several Group divisions and is of strategic importance in terms of data integrity and application availability. The Finance Information System Division Perimeter is entrusted with the delegated project management. It oversees the day-to-day functioning of applications, manages changes and takes all requisite steps to ensure the security of this IS.

Overall consistency is managed by the Group Information Systems Division, which coordinates the Information Systems function through common policies. New governance for the function was designed pursuant to the Chairman's decision of 19 December 2011 to improve Group steering of support functions. It also provides for a broader role for the Group Information Systems Division in order to guarantee IS synergies and performance for the benefit of business line strategy, in particular for the financial trajectory, security and availability of the IS. This new governance will help with expansion to the international subsidiaries.

Depending on their nature and the scope concerned, strategic decisions and choices are reviewed on a quarter basis either by one of the EDF Committees mentioned in § 2.1.1 or by the IS Strategy Committee, which involves the main Directors and subsidiary Heads and their IS Divisions; other major decisions are taken by a committee of the Heads of Information Systems, France, and by the Information Systems Group Committee, on which the Group's subsidiaries are also represented.

## 2.1.7 External controls

As is the case for all listed companies, EDF is subject to the regulatory control of the French financial markets authority (*Autorité des Marchés Financiers* – AMF). Due to the French State being a majority shareholder in EDF, the company can also be audited by the National Audit Office, State Auditors, the Inspectorate of Public Finances, the French National Assembly and Senate Commissions for Economic Affairs, and the Public Procurement Contracts Commission.

As required by French law, the Statutory Auditors certify the annual financial statements (parent company and consolidated statements) and carry out a limited review of the Group's summary consolidated half-year financial statements. They also issue an opinion on the annual report by the Chairman of the Board of Directors that is prepared pursuant to Article L.225-37 of the French Commercial Code.

Owing to the nature of its business activities, EDF is also subject to control by the French Energy Regulation Commission (*Commission de Régulation de l'Énergie* – CRE) and by the Nuclear Security Authority (*Autorité de Sûreté Nucléaire* – ASN).

The findings of these various external reviews bodies are incorporated into the internal control and audit programmes, in particular.

## 2.2 Risk management and control

### 2.2.1 Risk management and control policy

The objectives of the risk control policy are to:

- contribute to securing the Group's strategic and operating trajectory, and in order to do so:
  - identify and grade risks in all areas (operational risks, external risks, strategic risks, including risks that are linked to the consistency of actions with the Group's values, and those linked to protecting the Group's value, assets and reputation), with a view to ensuring a constant increase in the robustness of risk management,
  - ensure the Group's entities are made responsible and accountable for identifying, assessing and handling risks, so that each executive is aware of the risks inherent in his or her activities and implements the action required to control these risks;

- ensure that EDF senior executives and governance bodies have an aggregated and regularly-updated picture of the major risks and their level of control;
- meet the increasing information requirements of external stakeholders with regard to the management of risks across the organisation.

*NB:* the operating and functional entities are responsible for managing the risks that fall within their scope of activity, under the responsibility of Group Executive Management.

The Group's risk control policy is either implemented directly (for EDF and the controlled subsidiaries), or through governance bodies (for regulated subsidiaries and jointly-controlled affiliates).

This policy is supported by a risk control function that is separate from the risk management functions (supplemented by specific control functions concerning, in particular, financial and energy market risks – see § 2.3.1.1). This function provides, inter alia, a consistent approach to the identification, assessment and management of risks.

### 2.2.2 Risk mapping process

In accordance with these principles, every half-year, in line with the reporting schedules for the publication of the half-yearly consolidated financial statements, the EDF Group issues consolidated mapping of its major risks for the EDF scope and that of its controlled and jointly-controlled affiliates<sup>1</sup>. This consolidated risk mapping is based on maps established by each operating or functional entity using a common methodology (typology, identification and assessment principles, risk control measures, etc.). Each risk identified must be the subject of a detailed action plan. Responsibility for the major risks falls to a project leader appointed by the Executive Committee.

In-depth discussions concerning the up-dating of risk mapping are regularly held between the Group Risk Control Division (see § 2.1.3.1) and each of the contributing operating or functional entities. These discussions aim to review the relevance of the risk identification, as well as the robustness of the management initiatives taken.

Each half-year, the consolidated risk mapping is submitted for approval by the Executive Committee and, following review by the Audit Committee, is presented to the EDF Board of Directors.

The risk mapping and management initiative is one aspect of the strong complementarity with Group internal control and with internal audit, for which the programme is designed on the basis of, inter alia, the major risks identified. Moreover, the risk mapping process also provides a foundation for a number of other processes: the Insurance Strategy and its implementation, the analysis of risks involved in projects reviewed by EDF's decision-making bodies (the Executive Committee, the Commitments Committee that reports to the Group Executive Committee, etc.); in particular, through risk mapping, the risk control process helps secure the long-term investments and commitments process by monitoring the quality of the risk analysis of projects submitted to the Group Executive Committee. Lastly, the main risks to which the Group is exposed are described in section 4.1 of the 2012 Reference Document, in compliance with the consolidated risk mapping for the Group.

### 2.2.3 Crisis management policy

The crisis management policy, which was formalised by a decision of the Chairman and CEO in June 2005, defines the organisational and crisis management principles for the EDF scope and that of its controlled subsidiaries, and describes in full the procedure to be implemented. The primary focus of the policy is:

- ensuring the existence of crisis management structures and standing reporting procedures for alerts, in all Group entities;

- verifying the existence of and regularly updating appropriate crisis management procedures, in light of the risks incurred in each EDF division and in the controlled subsidiaries;
- defining the procedures for cooperating with the regulated subsidiaries and – via the Divisions to which they report – with the jointly-controlled affiliates, during crisis periods;
- ensuring that feedback from crises and crisis exercises is systematically taken into account, so as to avoid or limit the consequence of similar future crises;
- verifying the existence of professionalization initiatives for all crisis management stakeholders.

The internal control procedure for the crisis management policy is incorporated into the Group's internal control system. Moreover, a programme of crisis exercises enables the effectiveness of these procedures and their overall consistence to be regularly stress-tested. Finally, the crisis management organisation is regularly readjusted to reflect any significant changes in internal organisation or the external environment, as well as in the light of lessons learned following a major crisis.

## 2.3 Group control activities

### 2.3.1 Control procedures relating to the effective functioning of internal processes

#### 2.3.1.1 Sectoral strategies on risk control

##### 2.3.1.1.1 Energy market risk control

Each year the Executive Management approves the entities' hedging strategies, as well as the associated risk limits, which are presented to it by the Corporate Risk Management Division (DCRG) after consolidation at Group level and in accordance with the budget process. These strategies are based on an energy market risk policy implemented by the DCRG and formalised by the Chairman and CEO's decision of 9 December 2005, which defines how these risks should be managed for the EDF scope and that of the controlled subsidiaries, and stipulates all the necessary procedures for its implementation and the control of its application. For the regulated subsidiaries and jointly-controlled affiliates, the Energy Market Risks Policy and the control procedure are reviewed within the framework of the governance bodies of these companies (Board of Directors or Supervisory Boards and Audit Committees).

This policy describes:

- the governance and measurement system, clearly separating the risk management and risk control responsibilities and enabling the tracking of exposure within the scope defined above;
- the risk control procedures involving EDF Executive Management in the event that risk limits are exceeded. Note that particularly rigorous risk control procedures are in operation at EDF Trading, given the specificity of the business activities and the fast reaction time required;
- the function responsible for controlling Energy Market Risks, which has a two-tier organisational structure, with the entities ensuring operating control and the Control department within Corporate Risk Management ensuring the second level of control.

The EDF Audit Committee issues an opinion to the Board of Directors on the Energy Market Risks Policy and the proposed changes to be made to it by the DCRG.

1. With the exception of Dalkia International.

## 2.3.1.1.2 Financial risk control

The Corporate Risk Management Division, among other things, is responsible for controlling interest rate, foreign exchange, liquidity and counterparty risk for EDF and the controlled subsidiaries. This control is exercised through:

- verifying the proper application of financial risk management principles and of the Group's counterparty risk policy, in particular through the regular calculation of risk indicators and the tracking of risk limits;
- executing methodology and organisation control missions within EDF entities and the controlled subsidiaries;
- controlling market positions in EDF's trading room, which is responsible for cash management. For these activities, a standing system of indicators and risk limits, which is verified daily, is used to track and control financial risk exposure. The Finance and Investments Division, the Head of the Trading Room and the Financial Risk Control Division are responsible for this and are expected to take immediate action if a limit is exceeded. The "Markets" committee, which meets, checks and reviews monthly, as required, requests for exemptions to the framework and investment requests for new products;
- controlling "Dedicated Assets" portfolio positions (within the Corporate Finance Division), for which management responsibility is assumed by the Asset Management Division. A specific framework has been implemented by the Corporate Risk Management Division, which defines the acceptable risk limits. The Operations Management Committee chaired by the Senior Vice President, Finance and Investments is the steering organisation for the management and monitoring of the financial risk associated with this portfolio.

In order to guarantee the independence of the financial risk control structure vis-à-vis the activities responsible for managing these risks, the Financial Risk Control department is attached to the Group Corporate Risk Management Division. This department has a functional link with the Financing and Investments Division.

## 2.3.1.1.3 Control of non-financial risks

Within the DCRG, EDF has set up a department that is specialised in the assessment of the non-financial risks associated with starting business relationships with third parties (consultants, suppliers, manufacturing partners, etc.), that are identified as being sensitive). Before starting a business relationship, formalised and auditable controls are performed with a view to preventing any risk of harm to reputation.

## 2.3.1.2 Specific controls

### 2.3.1.2.1 Procedure for approving commitments

In accordance with the Group's «commitments process», for which the framework is provided by a procedure that was updated on 28 September 2011, the Commitments Committee, which reports to the Group Executive Committee, reviews potential Group commitments, excluding regulated subsidiaries and jointly-controlled affiliates, once the Executive Committee has adopted a favourable position in principle with respect to the commitment concerned. This review covers, in particular:

- investment, disinvestment, merger and acquisition projects in excess of €50 million<sup>1</sup>;
- expenditure on supplies, works or services for an amount in excess of €200 million;
- long-term purchase or sale contracts that exceed annual limits of 5 TWh for electricity, 10 TWh for gas and €150 million for coal, fuel oil, CO<sub>2</sub> emission credits and allowances;
- the multi-year supply programme for reactors and back-end nuclear fuel cycle services;
- operations to transfer obligations regarding decommissioning or the back-end of the nuclear fuel cycle.

1. Excluding financial investments and disinvestments linked to the management of dedicated assets and pension assets, for which the governance is specific. See section 1.4.2.

Group Executive Committee meetings are systematically preceded by a meeting attended by experts at corporate level (Group Risk Management Division, Legal Affairs Division, Corporate Finance Division, Upstream-Downstream Optimization & Trading Division, Sustainable Development Division, Strategy Division, Procurements Division, etc.) and project managers in order to verify the exhaustiveness and depth of the risk analysis on the projects submitted. This work is based on methodology standards for the analysis of the risks involved in development projects, which take into account the full impact of a project.

Planned commitments are then reviewed by the Board of Directors, as described in § 1.2.4.

The "Investments Steering" Guide states that planned commitments below the threshold for referring matters to the Group Executive Committee will be reviewed by the governance bodies that are specific to each entity.

## 2.3.1.2.2 Information Systems (IS) control

### Organisation of the internal control of the Information Systems function

The internal control system for the Information Systems function is part of the Group's Internal Control Policy (that contains proposed control area standards, which the operating entities adapt to their specificities) and covers the implementation of the function's policies. These policies address, in particular, infrastructures and shared services, information systems security, information systems project management, information systems risk management and compliance with the French Data Protection Act.

For the record, EDF's Information Systems internal control referencing system is based on the COBIT (Control Objectives for Information and related Technology) external referencing system.

The Group Information Systems Division has coordinated the internal control and coverage of risks that are specific to Information Systems issues since 2009 at three levels within the function's organisation: a network of information systems internal control officers, a network of the risk officers and the Committee of the Heads of Information Systems who represent the divisions. In 2011, the interlinking of the risk officers', internal control and Information Systems networks made it possible to achieve even better coordination between risk coverage and internal control for EDF. These networks will be progressively extended to include international subsidiaries.

Moreover, in the field of information systems, the IS function has contributed to the standards for fraud detection tests.

### Actions in the field of IS security

The EDF group's Information Systems Security Policy structures the information system security policies and organisation for the Group's IS. For EDF, the adjustment of these policies, as well as the level of security, are monitored monthly by a security Committee, which is chaired by the Group Information Systems Director, and brings together the Heads of Information Systems Security from all the entities within the EDF scope. ERDF is associated with this initiative. The Information Systems Strategy Committee reviews, as required, in consultation with the Heads of the Corporate Risk Management Division and the Security Division, adjustments to the Group IS Security policy that are found to be necessary, without replacing the existing technical bodies. This ensures that a consistent, strategic vision is shared of IS security and IS key issues in terms of system availability and continuity, information and processing integrity, and the protection of sensitive information.

Key points for 2012 were:

- The implementation of a «Business Continuity Plan» exercise after finalising the geographical relocation of the data centres;
- The updating of three security directives (management of third parties, business continuation and management of security incidents for EDF-SA);

- A Review Board for Service Outsourcing Requests being set up within the Group IS Division. This Board is tasked with performing security analyses on outsourced services;
- A decision on digital exchanges between Group entities.

#### 2.3.1.2.3 Administration and oversight of subsidiaries

Each EDF subsidiary or shareholding (with the exception of the regulated subsidiaries) reports to a Senior Executive who is a member of the Executive Committee or to his or her delegated representative. These Senior Executives, or their representatives, put forward the directors who will represent EDF on the governance bodies of these subsidiaries or shareholdings, then send the directors concerned an assignment letter and a letter outlining their objectives.

The Directors and Companies Delegation, which was started in 2002, pays particular attention to:

- updates to company reporting line mapping, in the light of decisions taken by the Executive Management concerned;
- the tracking of “target composition profiles” which foresee the assembly of the necessary collective skills, as well as the profiles necessary to represent EDF effectively on the governance bodies of subsidiaries and shareholdings, in light of the strategy defined by the Senior Executives to whom they report;
- compliance with the appointment process for directors, prior management agreement for nomination (conformity with the “target composition profile”, control over the number of offices, the approval of the proposed director’s line management, etc.);
- the professional standards of new directors (induction training seminar for new directors with the support of the Corporate University, information via the intranet site for the directors community and on-going vocational training via Board Directors’ workshops).

#### 2.3.1.3 Other control policies

In October 2003, the Chairman and CEO approved a health and safety policy, which was completed on 1 February 2012 through a decision, which, inter alia, provides for preventive safety to be included in manager training and for a quarterly review to be performed at an Executive Committee meeting of the results and actions implemented within the Group in this area.

The EDF Group’s new insurance policy, which was presented to the Board of Directors in 2012, then approved and circulated in the Group, will be implemented in 2013. This new policy, which is a genuine integration tool, increases the insurance scope by covering all the Group’s assignments and scope. Its circulation will be accompanied by an Insurance Procedure Handbook, which is currently being finalised, in order to facilitate the policy’s implementation. Since that date, whenever there is any significant change, a status report is presented to the Audit Committee on the scope and the cost of adequately insuring EDF’s risks or transferring them to the financial markets. In 2011, the Strategic Insurance Guidelines Committee (“COSA”) was set up, which is chaired by the Group Senior Executive Vice President, Finance, who stimulates discussions between business lines and investors on changes to and methods for implementing the Insurance Strategy, in particular the main characteristics of the coverage schemes for insurance risks.

## 2.3.2 Internal control procedures relating to the reliability of accounting and financial information

### 2.3.2.1 AMF Reference Framework

The section of the Internal Control Manual that covers control over accounting and financial information was completely restructured in 2011 in order to conform to the AMF Reference Framework, as revised in 2010.

### 2.3.2.2 Group accounting standards and principles

The accounting standards used by the EDF Group<sup>1</sup> conform to the international accounting standards as published by the International Accounting Standards Board (IASB), and approved by the European Union, which have been applicable since 31 December 2012. These international standards comprise IAS (International Accounting Standards), IFRS (International Financial Reporting Standards) and the interpretations (SIC and IFRIC). The accounting rules and methods are described in the Group manual on accounting principles and summarised in the notes to the consolidated financial statements.

A network of correspondents in the Operating Divisions and subsidiaries facilitates sharing instructions and the consistent accounting implementation from one Group entity to another.

### 2.3.2.3 Procedures for preparing and controlling the consolidated financial statements

The Consolidation Department (part of the Accounts Consolidation Division) prepares the consolidated financial statements based on data input locally by each entity (entities of the parent company and subsidiaries), in accordance with Group standards and instructions, using a single chart of accounts.

The half-yearly consolidated financial statements are presented to the Audit Committee then to the Board of Directors, and closed off on 30 June of each fiscal year.

The annual consolidated financial statements are presented to the Audit Committee, then closed off on 31 December of the fiscal year by the EDF Board of Directors and approved by the general meeting.

Each time the half-yearly and annual financial statements are closed off, instructions are issued that specify all the deliverables expected from each person who plays a role in the publication of the financial statements, and in preparing the management report and the reference document used for annual closings. Meetings between the EDF divisions and the subsidiaries are used to prepare for each half-yearly closing, anticipate any changes in certain forms of accounting treatment and ensure that the financial and accounting information published is reliable. Subsequent analysis of the conditions under which the deliverables were produced (compliance with deadlines, quality of information, etc.) allows for a steady improvement in the process for preparing and analysing the consolidated financial statements.

A monthly reporting package containing information on the balance sheet and income statement accounts was set up in 2011. It made it possible to anticipate the recognition of complex operations and helped make balance sheet flows more reliable.

The use of a financial language that is shared by Accounting and Management Control contributes to the consistency of the Group’s steering. This common language is one of the ways of ensuring continuity between:

- actual data obtained from accounting and the data produced during the forecasting phases;
- external financial communication and internal steering.

This common language facilitates dialogue and cooperation between these two functions at all levels of the organisation and helps ensure the exchange of information between the players and the quality of the information produced.

### 2.3.2.4 Procedures for preparing and controlling the parent company financial statements

The parent company financial statements are prepared on a half-yearly and annual basis by the Parent Company Accounts Department (part of the Accounts Consolidation Division).

EDF’s transactional accounting (excluding the Financing and Investments Division, the Nuclear Fuel Department, Island Energy Systems and the Senior Executive Development Division for payroll accounting) is entrusted to an

1. The scope of the Group’s consolidated financial statements is detailed in the notes to the consolidated financial statements (cf. chapter 20 of the present reference document).



"Accounting" Shared Services Centre within the Shared Services Division. The handling of transactional accounting is organised by process. "Governance pacts" establish the respective responsibilities of the operating branches and divisions, the "Accounting" Shared Services Centre and the Accounting Consolidation Department.

Each operating branch and division Head makes a formalised annual commitment to respecting the internal control rules and ensuring the reliability of the financial information for which he or she is responsible via a letter of commitment addressed to the Head of Accounting.

The accounting internal control system is incorporated into the Group internal control system. EDF uses benchmark indicators, which make it possible to measure the extent to which certain aspects of accounting information are compliant, by process.

### 2.3.3 Internal control procedures relating to compliance with laws and regulations

The Legal Affairs Division has a remit to track changes in the law and regulations. It issues warnings and raises awareness within the relevant Divisions in light of any changes that are liable to impact the Group.

Pursuant to a joint decision of 1 June 2007, the Legal Affairs and Corporate Audit Divisions adopted an action plan aimed at formalising the role of Legal Affairs in defining the control objectives mandated in the different EDF entities, so that they can be taken into account in the entities' own internal control plans. These control objectives aim to ensure that these entities:

- inform the Legal Affairs Division of the regulatory areas that particularly concern them, to ensure that the Division can perform its monitoring assignment optimally;
- systematically involve the Legal Affairs Division as early as possible in matters involving significant strategic issues and legal risks;
- ensure that their delegations of power effectively reflect their organisation;
- identify their needs in terms of legal awareness within the fields that concern them, including crosscutting needs, and notify them to the Legal Affairs Division;
- ensure that individuals granted delegations of powers are aware of the scope and the consequences of their delegation.

#### 2.3.3.1 Regulations relating to industrial operations

Numerous control procedures exist in the field of industrial operations, in particular for nuclear facilities.

The nuclear sector regulations in force are specific to each country where facilities are located. External controls are organised by the relevant national authorities (the Nuclear Safety Authority in France (ASN), the Nuclear Directorate within the Health and Safety Executive, Office for Nuclear Generation in the United Kingdom, the Nuclear Regulatory Commission in the United States, the National Nuclear Safety Administration in China, etc.).

Within EDF, this responsibility falls to the following executives and/or entities:

- the Nuclear Safety Council, which is chaired by the EDF Group Chairman, meets several times a year and in February reviews the annual "Nuclear Safety and Radioprotection" report;
- the General Inspector for nuclear safety and radioprotection (IGSNR) who, on behalf of the Chairman, ensures that all aspects of safety and

radiation protection in the nuclear facilities for which EDF has operating responsibility are fully taken into account and whose annual report is made public;

- the Nuclear Inspectorate, a department that reports directly to the Senior Vice President, Nuclear Operations, and the Audit Assessment Taskforce, which functionally reports to the Senior Vice President, Nuclear Engineering, the verification work of which makes it possible to regularly assess the level of safety in all the various Nuclear Operations and Nuclear Engineering entities and their work;
- The Audit function carries out several dozen audits per year in the nuclear field (engineering, fuels and operations).

The Law of 28 June 2006, as amended by NOME law on the New Electricity Market Organisation of 7 December 2010, and its implementation regulations (decree of 23 February 2007 and Order of 21 March 2007) on securing financing for nuclear expenses, require the Company to produce a report on the procedures and systems used to assess the expenses linked to the sustainable management of radioactive matter and waste. This report must specify the methods applied to calculate the related provisions and the choices made for the composition and management of the assets allocated to covering the provisions.

Since June 2007, and in accordance with the legislative and regulatory framework, EDF files a report with the administrative authority every three years and sends an update letter yearly. The second tri-annual report was finalised in June 2010 and updated in 2011 and 2012. These reports and update letters are given an in-depth review by the Nuclear Commitments Monitoring Committee, which then reports to the EDF Board of Directors before sending the reports and letters to the administrative authority. The report on internal control that is appended to the updating letter was deliberated by the Board of Directors.

In the other operations-related areas (such as, for example, the monitoring of pressure vessels and dam surveillance), each entity is responsible for defining and implementing the appropriate control procedures.

Immediately following the Fukushima accident of 11 March 2011, EDF acted responsibly in its capacity as a nuclear operator by applying the lessons learned to its own facilities the same month. The 19 site Complementary Safety Evaluation reports (those for the Flamanville and Penly plants also have an "EPR" section) show the high safety levels at all of EDF's nuclear facilities in terms of the threats highlighted by the Fukushima incident, (earthquake and floods). These reports propose additional countermeasures that would make it possible to increase the fleet's robustness to situations for which the levels go well beyond those under consideration, and that would exceed current nuclear safety requirements.

The ASN notified its findings to the French government in a report dated 3 January 2012, which contains an opinion (no. 2012-AV-0139) in which the ASN states, in particular:

*"Following the complementary safety assessments of the priority nuclear facilities, ASN considers that the facilities examined offer a sufficient level of safety for it not to request the immediate shutdown of any of them. At the same time, ASN considers that for the continuation of their operation, an increase in the robustness of the facilities to extreme situations, beyond their existing safety margins, is necessary, as rapidly as possible."*

In 2012 the ASN issued a set of technical requirements for each site, with deadlines for the complementary measures to be implemented that are consistent with this opinion.

The ECS reports on dismantled sites were provided to the ASN in mid-September 2012, as planned.



As part of the Peer Reviews organised by the ENSREG (European Nuclear Safety Regulators Group) following the Fukushima accident, a team of auditors, with ASN representatives, visited the Tricastin site in order to assess the site section of the ECS report on this site. Additional ENSREG visits were then held on the Chooz, Cattenom and Fessenheim sites. These Peer Reviews confirmed the relevance of the initiatives EDF has adopted or will adopt in order to improve the robustness of its facilities.

#### 2.3.3.2 Other regulations

Control procedures are also used for the application of labour and employment regulations.

The implementation of management systems, particularly with regard to environmental considerations (see § 2.1.5.2) and Health and Safety, has enabled tighter control of the application of regulations and compliance with any regulatory changes to be foreseen.

### 2.3.4 Internal control procedures relating to the application of Executive Management instructions and policies

As part of the deployment of internal control within the Group, the monitoring of the effective implementation of major decisions and policies is taken into account by their inclusion in the Internal Control Reference Manual. Moreover, audits may be included in the corporate audit programme in order to check the correct implementation of these decisions and policies, and that the targets set within this framework are attained.

*This report was prepared by a working group coordinated by the EDF Corporate Audit Division, which includes representatives of the Legal Affairs, Corporate Risk Management and Corporate Finance Divisions, as well as the General Secretary to the Board of Directors. Various contributors, such as the Ethics and Compliance Standards Delegation, the Information Systems Division, the Directors and Companies Delegation, the Sustainable Development Division and the Investors and Markets Division were also involved. This report was successively reviewed by the Group General Secretary (4 February 2013), the Financial Disclosure Committee (29 January 2013) and the Audit Committee (11 February 2013) before being approved by the Board of Directors' meeting of 13 February 2013, in accordance with Article L. 225-37 of the French Commercial Code.*

## 2.4 Information communication and circulation

In addition to the communication and reporting initiatives outlined within this report, the following specific initiatives are noteworthy:

- Since EDF shares were listed for trading in 2005, EDF has established procedures that aim to provide a framework for and ensure the reliability of EDF financial disclosure processes and content, as well as to prevent market abuse. Accordingly, a procedure has been defined to organise the respective roles within the Company with regard to the preparation, validation and dissemination of financial disclosure data. A system for validating Financial Information, designed to ensure the validation and consistency of EDF's different financial communication sources, to review and validate the contents of all financial communication channels has been set up. This Committee comprises representatives from the Corporate Finance, Communication and Legal Affairs Divisions. Furthermore, since 2006 the EDF group has adopted principles and rules that are applicable to transactions involving EDF securities or those of the EDF group's listed subsidiaries. These rules have been compiled in an Ethics Code that was updated in March 2011, in order to take into account the AMF recommendations of November 2010, and was presented to the EDF Executive Committee on 4 April 2011. In parallel with the publication of this Code, initiatives to raise awareness of stock market rules have been taken vis-à-vis Group employees', in particular concerning the precautions and obligations associated with holding inside information and the blackout periods during which senior executives and certain employees who are party to insider information may not trade in the Company's shares.
- The Code of Conduct: compliance with the codes of conduct for the regulated subsidiaries is monitored annually by these subsidiaries, and verified by the French Energy Regulation Commission, which publishes the results of its checks in its annual report.

Paris, 13 February 2013.

The Chairman and CEO of EDF,  
Henri Proglio

# B Statutory Auditors' Report, prepared in accordance with Article L. 225-235 of the French Commercial Code ("Code de commerce"), on the Report prepared by the Chairman of the Board of Directors of Électricité de France SA

*This is a free translation into English of the statutory auditors' report issued in French prepared in accordance with Article L.225-235 of French company law on the report prepared by the Chairman of the Board of Directors on the internal control and risk management procedures relating to the preparation and processing of accounting and financial information issued in French and is provided solely for the convenience of English speaking users.*

*This report should be read in conjunction and construed in accordance with French law and the relevant professional standards applicable in France.*

## Year ended 31 December 2012

To the shareholders,

In our capacity as Statutory Auditors of Électricité de France SA ("the Company"), and in accordance with Article L.225-235 of the French Commercial Code ("Code de commerce"), we hereby report on the Report prepared by the Chairman of your Company in accordance with Article L.225-37 of the French Commercial Code for the year ended 31 December 2012.

It is the Chairman's responsibility to prepare, and submit to the Board of Directors for approval, a report on the internal control and risk management procedures implemented by the Company and containing the other disclosures required by Article L.225-37 of the French Commercial Code particularly in terms of the corporate governance measures.

It is our responsibility:

- to report to you on the information contained in the Chairman's Report in respect of the internal control and risk management procedures relating to the preparation and processing of the accounting and financial information, and
- to attest that this Report contains the other disclosures required by Article L.225-37 of the French Commercial Code, it being specified that we are not responsible for verifying the fairness of these disclosures.

We conducted our work in accordance with professional standards applicable in France.

## Information on the internal control and risk management procedures relating to the preparation and processing of accounting and financial information

The professional standards require that we perform the necessary procedures to assess the fairness of the information provided in the Chairman's Report in respect of the internal control and risk management procedures relating to the preparation and processing of the accounting and financial information. These procedures consisted mainly in:

obtaining an understanding of the internal control and risk management procedures relating to the preparation and processing of the accounting and financial information on which the information presented in the Chairman's Report is based and existing documentation;

obtaining an understanding of the work involved in the preparation of this information and the existing documentation;

determining if any significant weaknesses in the internal control procedures relating to the preparation and processing of the accounting and financial information that we would have noted in the course of our engagement are properly disclosed in the Chairman's Report.

On the basis of our work, we have nothing to report on the information in respect of the Company's internal control and risk management procedures relating to the preparation and processing of accounting and financial information contained in the Report prepared by the Chairman of the Board in accordance with Article L.225-37 of the French Commercial Code.

## Other disclosures

We hereby attest that the Chairman's Report includes the other disclosures required by Article L.225-37 of the French Commercial Code.

Paris La Défense and Neuilly-sur-Seine, 13 February 2013

The Statutory Auditors

KPMG Audit  
Department of KPMG SA

Bernard Cattenoz

Jacques-François Lethu

Deloitte & Associés

Alain Pons

Patrick E. Suissa

# C Statutory Auditors' Report on Regulated Agreements and Commitments

*This is a free translation into English of the Statutory Auditors' special report on regulated agreements and commitments with third parties that is issued in French language and is provided solely for the convenience of English speaking readers. This report on regulated agreements and commitments should be read in conjunction with, and construed in accordance with, French law and professional auditing standards applicable in France. It should be understood that the agreements reported on are only those provided by the French Commercial Code and that the report does not apply to those related party transactions described in IAS 24 or other equivalent accounting standards.*

## Shareholders' meeting approving the financial statements for the year ended 31 December, 2012

To the shareholders,

In our capacity as Statutory Auditors of your Company, we hereby present to you our report on the regulated agreements and commitments.

The terms of our engagement require us to communicate to you, based on information provided to us, principal terms and conditions of those agreements and commitments brought to our attention or which we may have discovered during the course of our audit, without expressing an opinion on their usefulness and appropriateness or identifying such other agreements and commitments, if any. It is your responsibility, pursuant to article R.225-31 of the French Commercial Code ("Code de Commerce"), to assess the interest involved in respect of the conclusion of these agreements and commitments for the purpose of approving them.

Our role is also to provide you with the information stipulated in article R.225-31 of the French Commercial Code, relating to the implementation during the past year of agreements and commitments previously approved by the Shareholders' Meeting, if any.

We conducted the procedures we deemed necessary in accordance with the professional guidelines of the French National Institute of Statutory Auditors (*Compagnie nationale des Commissaires aux comptes*), relating to this engagement. These procedures consisted in agreeing the information provided to us with the relevant source documents.

## Agreements and Commitments submitted to the general shareholders' meeting approval

We hereby inform you that we have not been advised of any agreement and commitment authorized during the year to be submitted to the approval of the Shareholders' Meeting pursuant to article L.225-38 of the French Commercial Code.

## Continuing agreements and Commitments already approved by the general shareholders' meeting

Pursuant to article R.225-30 of the French Commercial Code, we have been informed that the following agreements and commitments, previously approved by Shareholders' Meeting of prior years, have remained in force during the year:

### ■ Public Service Contract

On October 24, 2005, the French State and Électricité de France SA signed a public service contract whose purpose is to form the framework for the Company's public service mission and duties.

This contract sets out the commitments undertaken by the Company over the period 2005-2006-2007 and defines the financial compensation payable for public service obligations, in particular the principles set for the calculation of and the change in electricity sales tariffs. In the absence of a new agreement, the performance of certain provisions of this contract was continued in 2011.

### ■ Final processing-recycling agreement entered into by EDF and AREVA for the period 2008-2012

In application of the agreement of 19 December, 2008 setting forth the principles governing back-end cycle contracts for the post-2007 period, EDF and AREVA signed on 12 July, 2010, the contract "EDF-AREVA NC Processing-Recycling Agreement" which lays down (i) the contractual terms for the period 2008-2012, including the payment by EDF of an upfront payment of €120 million repayable on 31 December, 2012, and (ii) the principles governing prices and investments for subsequent periods. The upfront payment has been repaid in full during 2012 by AREVA.

## ■ Agreements with the AREVA Group

Your Company entered into three agreements with the AREVA Group in 2007 with respect to the following services:

- Construction of the nuclear boiler for the Flamanville 3 EPR nuclear plant;
- Maintenance and servicing of boilers as part of the third ten-year inspection of the 900MW-type nuclear plants in France;
- Advance booking of forged parts for EPR reactors constructed abroad.

Total consideration for these agreements and their amendments amounted respectively to €994 million (of which €149 million recorded in 2012), €122 million (of which €13 million recorded in 2012) and €212 million (no amount recorded in 2012).

## ■ Agreement entered into between EDF, AREVA and the CEA in respect with the audits required by the DGEC

In accordance with the law of 28 June, 2006 related to the sustainable management of radioactive materials and waste, and in compliance with the application decree of 23 February, 2007 on securing the funds to cover the nuclear expenses, the French Department for Energy and Climate (*Direction Générale de l'Énergie et du Climat* or "DGEC") asked the main actors of the French nuclear industry to perform audits of their tools used for the valuation of the nuclear generation cycle obligations. As those audits are common to the aforementioned three operators, the DGEC requested that a single set of specifications be prepared with the selection of a single contractor for each of them.

On 25 May, 2011, the three stakeholders and the DGEC, as the prescriber, entered into an agreement that sets out:

- the organization and governance rules of the combination agreed by the stakeholders with respect to the performance of the audits;
- the terms and conditions upon which the stakeholders will set up the financing and monitor the tender procedure related to those audits.

During 2012, discussions were related to the terms of organization and carrying out of the audits, including the terms of the selection of a contractor.

Paris – la Défense and Neuilly-sur-Seine, 13 February, 2013

The Statutory Auditors

KPMG Audit  
Département de KPMG S.A.

Bernard Cattenoz

Jacques-François Lethu

Deloitte & Associés

Alain Pons

Patrick E. Suissa

# D EDF SA's financial statements and Statutory Auditor's Report on the financial statements

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## Income statements

(in millions of Euros)

	Notes	2012	2011
<b>SALES <sup>(1)</sup></b>	4	<b>44,106</b>	<b>41,950</b>
Change in inventories and work-in-progress		5	18
Capitalised production		651	462
Operating subsidies	5	4,698	3,565
Reversals of provisions, amortisation and depreciation	6	2,941	2,437
Transfers of charges		83	78
Other operating income	7	560	647
<b>I TOTAL OPERATING INCOME</b>		<b>53,044</b>	<b>49,157</b>
<b>Purchases and other external expenses</b>	8	<b>34,805</b>	<b>32,208</b>
Fuel purchases used - power generation		4,265	3,116
Energy purchases		12,013	10,696
Services and other purchases used		18,527	18,396
<b>Taxes other than Income taxes</b>	9	<b>2,233</b>	<b>2,609</b>
Based on salaries and wages		145	142
Energy-related		1,006	1,398
Other		1,082	1,069
<b>Personnel expenses</b>	10	<b>6,238</b>	<b>5,761</b>
Salaries and wages		3,687	3,600
Social contributions		2,551	2,161
<b>Depreciation, amortisation and provisions</b>		<b>4,936</b>	<b>3,558</b>
Depreciation and amortisation on fixed assets	11	2,354	2,100
Depreciation on fixed assets	12	9	14
Depreciation on current assets	12	204	162
Provisions for risks and expenses	12	2,369	1,282
<b>Other operating expenses</b>	13	<b>989</b>	<b>1,064</b>
<b>II TOTAL OPERATING EXPENSES</b>		<b>49,201</b>	<b>45,200</b>
<b>Operating profit (I - II)</b>		<b>3,843</b>	<b>3,957</b>
Joint operations			
<b>III PROFIT ASSIGNED OR LOSS TRANSFERRED</b>		<b>5</b>	<b>8</b>
<b>IV LOSS CHARGED OR PROFIT TRANSFERRED</b>		<b>-</b>	<b>1</b>
Income from investments		2,478	1,047
Income from other securities and receivables related to fixed assets		1,039	344
Interest and similar income		408	827
Reversals of provisions and transfers of charges		975	424
Foreign exchange gains		1,953	2,291
Net income on sales of marketable securities		28	79
<b>V TOTAL FINANCIAL INCOME</b>		<b>6,881</b>	<b>5,012</b>
Financial amortisation and provisions		3,015	3,344
Interest and similar expenses		2,023	2,158
Foreign exchange losses		1,860	2,179
Net charges on sales of marketable securities		1	18
<b>VI TOTAL FINANCIAL EXPENSES</b>		<b>6,899</b>	<b>7,699</b>
<b>Financial result (V - VI)</b>	14	<b>(18)</b>	<b>(2,687)</b>
<b>Profit or loss before income taxes and exceptional items (I - II + III - IV + V - VI)</b>		<b>3,830</b>	<b>1,277</b>
<b>VII EXCEPTIONAL RESULT</b>	15	<b>196</b>	<b>197</b>
<b>VIII INCOME TAXES</b>	16	<b>460</b>	<b>356</b>
<b>PROFIT OR LOSS (I - II + III - IV + V - VI + VII - VIII)</b>		<b>3,566</b>	<b>1,118</b>

(1) Production of goods for export in 2012: €5,648 million; production of services for export in 2012: €634 million.

## Balance sheets

	Notes	31/12/2012			31/12/2011
		Gross values	Depreciation or amortisations	Net values	Net values
(in millions of Euros)					
ASSETS					
Intangible assets	17-18	1,119	382	737	693
Land		117	6	111	110
Buildings		9,228	6,057	3,171	3,227
Technical installations, plant and machinery, equipment and fixtures		59,902	40,063	19,839	18,411
Other tangible assets		1,202	741	461	394
Property, plant and equipment owned by EDF	17-18	70,449	46,867	23,582	22,142
Land		39	-	39	38
Buildings		9,026	5,737	3,289	3,275
Technical installations, plant and machinery, equipment and fixtures		3,497	1,823	1,674	1,651
Other tangible assets		11	11	-	-
Property, plant and equipment operated under concession	17-18	12,573	7,571	5,002	4,964
Work-in-progress		7,697	-	7,697	6,769
Advances		1,862	-	1,862	1,368
Tangible assets in progress	17	9,559	-	9,559	8,137
Intangible assets in progress	17	1,165	-	1,165	1,014
Investments and related receivables		58,160	795	57,365	52,552
Investment securities		14,750	540	14,210	12,383
Loans and other financial assets		8,568	-	8,568	4,830
Investments	19-20-23	81,478	1,335	80,143	69,765
TOTAL I FIXED ASSETS		176,343	56,155	120,188	106,715
Raw materials		8,299	14	8,285	7,958
Other supplies		996	162	834	693
Work-in-progress and other		21	-	21	18
Inventories	22	9,316	176	9,140	8,669
Advances on orders	23	906	-	906	796
Trade receivables and related accounts		13,185	315	12,870	11,653
Other receivables		3,706	2	3,704	6,692
Trade and other receivables	23	16,891	317	16,574	18,345
Marketable securities	24-25	8,954	7	8,947	9,049
Cash instruments	23	2,801	-	2,801	2,807
Cash and cash equivalents	25	3,685	-	3,685	3,194
Prepaid expenses	23	1,335	-	1,335	603
Other current assets		16,775	7	16,768	15,653
TOTAL II CURRENT ASSETS		43,888	500	43,388	43,463
Deferred charges (III)		242	-	242	257
Bond redemption premiums (IV)		549	82	467	324
Unrealised foreign exchange losses (V)	26	340	-	340	295
TOTAL ASSETS (I + II + III + IV + V)		221,362	56,737	164,625	151,054

<i>(in millions of Euros)</i>	Notes	31/12/2012	31/12/2011
<b>EQUITY AND LIABILITIES</b>			
Capital		924	924
Capital-related premiums			
Share issue premium		7,015	7,015
Merger premium		25	25
Revaluation surplus			
Special reserves - Law of 28 December 1959		655	668
Tax-regulated reserves - Law of 29 December 1976		15	15
Other reserves		3,000	3,000
Tax-regulated reserves			
Legal reserves		92	92
Retained earnings		3,713	4,286
Profit or loss for the financial year		3,566	1,118
Interim dividend		(1,053)	(1,053)
Investment subsidies		190	171
Tax-regulated provisions			
Provisions related to depreciable fixed assets (Law of 30 December 1977)		11	14
Excess depreciation		6,312	6,535
<b>Equity</b>	27	<b>24,465</b>	<b>22,810</b>
Special concession accounts	28	1,999	1,968
<b>TOTAL I EQUITY AND CONCESSION ACCOUNTS</b>		<b>26,464</b>	<b>24,778</b>
Provisions for risks	29	681	553
Provisions for expenses			
Renewal of facilities operated under concession		248	238
Back-end nuclear cycle	30	16,611	15,865
Decommissioning and last cores	30	15,293	13,854
Employee benefits	31	10,751	10,594
Other expenses	32	490	637
<b>TOTAL II PROVISIONS</b>		<b>44,074</b>	<b>41,741</b>
Bonds and borrowings		48,203	40,093
Advances received on consumption		65	90
Other debts		1,214	1,178
Financial liabilities	33-34	49,482	41,361
Advances and payments on account received	33	5,833	5,444
Trade payables and related accounts		7,894	7,793
Tax and social security debts payable		6,626	5,575
Debts related to fixed assets and related accounts		1,538	1,381
Other liabilities		15,947	15,757
Operating, investment and other liabilities	33	32,005	30,506
Cash instruments	33	2,370	1,889
Deferred income	33	4,232	5,185
<b>TOTAL III LIABILITIES</b>		<b>93,922</b>	<b>84,385</b>
Unrealised foreign exchange gains (IV)	26	165	150
<b>TOTAL EQUITY AND LIABILITIES (I + II + III + IV)</b>		<b>164,625</b>	<b>151,054</b>

## Cash flow statements

(in millions of Euros)

	2012	2011
<b>Operating activities</b>		
Profit/(loss) before income tax	4,026	1,474
Amortisation, depreciation and provisions	3,746	3,913
Capital (gains)/losses	(6)	(100)
Financial (income) and expenses	(1,995)	(171)
Changes in working capital	(2,270)	(797)
<b>Cash flows from operations</b>	<b>3,501</b>	<b>4,319</b>
Net financial expenses, including dividends received	1,243	(325)
Income taxes paid	(1,173)	(849)
<b>Net cash flow from operating activities (A)</b>	<b>3,571</b>	<b>3,145</b>
<b>Investing activities</b>		
Purchases of property, plant and equipment and intangible assets	(4,713)	(4,146)
Sales of property, plant and equipment and intangible assets	37	33
Changes in financial assets	(4,860)	(1,639)
<b>Net cash flows used in investing activities (B)</b>	<b>(9,536)</b>	<b>(5,752)</b>
<b>Financing activities</b>		
Issuance of borrowings and underwriting agreements	9,618	6,168
Repayment of borrowings and underwriting agreements	(2,244)	(2,108)
Dividends paid	(2,125)	(2,122)
Funding contributions received for assets operated under concessions	14	13
Investment subsidies	11	51
<b>Net cash flows from financing activities (C)</b>	<b>5,274</b>	<b>2,002</b>
<b>Net increase/(decrease) in cash and cash equivalents (A)+(B)+(C)</b>	<b>(691)</b>	<b>(605)</b>
<b>CASH AND CASH EQUIVALENTS - OPENING BALANCE *</b>	<b>(3,100)</b>	<b>(2,521)</b>
Effect of currency fluctuations	24	(68)
Financial income on cash and cash equivalents	68	94
<b>CASH AND CASH EQUIVALENTS - CLOSING BALANCE *</b>	<b>(3,699)</b>	<b>(3,100)</b>

\* "Cash and cash equivalents – opening balance" and "Cash and cash equivalents – closing balance" do not include investment funds, nor negotiable debt instruments maturing in more than three months. Details of the variation in cash and cash equivalents are presented in note 25.



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## Notes to the financial statements

Électricité de France SA (EDF), the parent company of the EDF group, is a French *société anonyme* operating in electricity generation and electricity and gas supply. EDF also covers all the business activities of Island Energy Systems, IES (located in Corsica and France's overseas departments).

## ➤ Note 1. Accounting principles and methods

### 1.1 Accounting standards

EDF's annual financial statements are prepared in accordance with the accounting principles and methods defined by the French national chart of accounts, as presented by CRC (French accounting committee) regulation 99-03 of 29 April 1999 with additions in subsequent regulations.

### 1.2 Management judgments and estimates

The preparation of the financial statements requires the use of judgments, best estimates and assumptions in determining the value of assets and liabilities, income and expenses recorded for the period, considering positive and negative contingencies existing at year-end. The figures in EDF's future financial statements could differ significantly from current estimates due to changes in these assumptions or economic conditions.

The principal sensitive accounting methods involving use of estimates and judgments are described below.

In a context characterised by financial market volatility, the parameters used to prepare estimates are based on macro-economic assumptions appropriate to the very long-term cycle of EDF's assets.

#### 1.2.1 Nuclear provisions

The measurement of provisions for the back-end of the nuclear cycle, decommissioning and last cores is sensitive to assumptions concerning costs, inflation rate, long-term discount rate, and disbursement schedules. A revised estimate is therefore established at each closing date to ensure that the amounts accrued correspond to the best estimate of the costs eventually to be borne by EDF. Any significant differences resulting from these revised estimates could entail changes in the amounts accrued.

The main assumptions and sensitivity analyses are presented in note 30.3.

#### 1.2.2 Pensions and other long-term and post-employment benefits

The value of pensions and other long-term and post-employment benefit obligations is based on actuarial valuations that are sensitive to all the actuarial assumptions used, particularly concerning discount rates and wage increase rates.

The principal actuarial assumptions used to calculate these post-employment and long-term benefits at 31 December 2012 are presented in note 31.4. These assumptions are updated annually. EDF considers the actuarial assumptions used at 31 December 2012 appropriate and well-founded, but future changes in these assumptions could have a significant effect on the amount of the obligations and EDF's net income.

### 1.2.3 Energy supplied but not yet measured and billed

The quantities of energy supplied but not yet measured and billed are calculated at the reporting date based on consumption statistics and selling price estimates. Determination of the unbilled portion of sales revenues at the year-end is sensitive to the assumptions used to prepare these statistics and estimates.

### 1.3 Sales

Sales essentially comprise income from the sales of energy and services. Services for delivery through the energy distribution network purchased from the subsidiary ERDF and invoiced to end-customers contribute to EDF's energy sales.

EDF accounts for sales when:

- there is a proven contractual relationship;
- delivery has taken place (or the service has been completed);
- a quantifiable price has been established or can be determined;
- and the receivables are likely to be recovered.

Delivery takes place when the risks and benefits associated with ownership are transferred to the buyer.

The quantities of energy delivered to EDF customers but not yet measured and billed at the end of the period are calculated based on the quantities used by the sites of the EDF balance responsible entities less the quantities billed, after losses measured by a statistical method presented to the *Commission de Régulation de l'Énergie* (CRE), the French Energy Regulation Commission. These quantities are valued using an average price determined by reference to energy invoiced in the previous month.

Sales of goods and revenues on services not completed at the balance sheet date are valued by reference to the stage of completion at that date.

Sales of energy to EDF Trading, the Group's trading company, are recorded at their contractually stipulated amount.

### 1.4 Intangible assets

#### 1.4.1 Research and development expenses

Research expenses are recognised as expenses in the financial period incurred.

Project development expenses are capitalised as an intangible asset if EDF can demonstrate:

- the technical feasibility of making the intangible asset ready for commissioning or sale;

- its intention to complete the intangible asset and use or sell it;
- its ability to use or sell the intangible asset;
- how the intangible asset will generate likely future economic benefits;
- the availability of the appropriate resources (technical, financial or other) to complete development and use or sell the intangible asset;
- its ability to provide a reliable estimate of expenses attributable to the intangible asset during its development.

Capitalised development expenses are amortised on a straight-line basis over the foreseeable useful life.

## 1.4.2 Other intangible assets

Other intangible assets mainly consist of software, concessions, patents and similar rights, operating rights, storage capacity reservation costs, and greenhouse gas emission rights.

In application of ruling 2004-330 of 14 April 2004, since 1 January 2005 the French State has attributed energy operators a fixed quantity of emission rights representing one tonne of carbon dioxide equivalent each for a specified period under the National Allocation Plan.

In compliance with CNC (French National Accounting Council) Emergency Committee opinion 2004-C issued on 23 March 2004, greenhouse gas emission rights are recorded as intangible assets at their market value at the date of registration in the SERINGAS register managed by the *Caisse des Dépôts et Consignations*, with an offsetting entry under "Other liabilities".

Intangible assets other than greenhouse gas emission rights are amortised on a straight-line basis over their useful lives regardless of whether they are generated in-house or purchased.

## 1.5 Property, plant and equipment

EDF's property, plant and equipment is reported under two balance sheet headings, as appropriate to the business and contractual circumstances of their use:

- property, plant and equipment owned by EDF;
- property, plant and equipment operated under concession.

### 1.5.1 Valuation

Property, plant and equipment is recorded at acquisition or production cost or at its revalued amount where applicable, less accumulated depreciation and provisions:

- cost corresponds to acquisition or production cost (including external costs as well as costs incurred directly by EDF);
- the revaluations were performed in accordance with French legislation (law of 28 December 1959 for fixed assets commissioned before 1 January 1960 and specific legislation issued for those commissioned before 1 January 1977).

The cost of facilities developed in-house includes all labour and materials costs, and all other production costs attributable to the construction cost of the asset.

EDF capitalises safety expenses incurred as a result of legal and regulatory obligations sanctioning non-compliance by an administrative ban from operation.

The cost of property, plant and equipment also includes decommissioning costs for generation plants, and last core costs for nuclear facilities. These assets are associated with the provisions recorded to cover these obligations. At the date of commissioning, they are measured and recorded in the same way as the corresponding provision.

When some of the decommissioning costs for a plant are to be borne by a partner, the expected reimbursement is recognised as accrued income in the assets. The difference between the provision and the accrued income is recorded as a tangible asset, and subsequent payments by the partner are deducted from the accrued income.

They are depreciated in the same way and over the same useful life as the relevant facility. The asset ceases to be recognised when the associated facility has been totally depreciated.

Borrowing costs attributable to the financing of an asset incurred during the construction period, and pre-operating expenses, are recognised as expenses.

## 1.5.2 Depreciation

Items of property, plant and equipment are depreciated on a straight-line basis over their useful life, defined as the period during which the company expects to draw future economic benefits from their use.

The expected useful lives for the main facilities are as follows:

- |  |                |
|--|----------------|
| ■ Hydroelectric dams   | 75 years       |
| ■ Electromechanical equipment used in hydropower plants            | 50 years       |
| ■ Fossil-fired power plants  | 25 to 45 years |
| ■ Nuclear generation facilities                                    | 40 years       |
| ■ Transmission and distribution installations (lines, substations) | 20 to 45 years |

## 1.5.3 Property, plant and equipment owned by EDF

Most of the property, plant and equipment owned by EDF concern nuclear facilities.

The following components are included in the balance sheet value of property, plant and equipment owned by EDF:

- the discounted cost of decommissioning the facilities;
- and for nuclear installations, the discounted cost of last core nuclear fuel, including:
  - the cost of the loss on reactor fuel that will not be fully irradiated when production shuts down and cannot be reused because of technical and regulatory constraints;
  - the cost of processing this fuel;
  - and the cost of removing and storing waste resulting from these operations.

Strategic safety spare parts for nuclear facilities are treated as property, plant and equipment, and depreciated over the residual useful life of the installations.

When a part of an asset has a different useful life from the overall asset's useful life, it is identified as an asset component and depreciated over a specific period.

This mainly concerns the costs of major inspections, which are amortised over a period corresponding to the time elapsing between two inspections.

Until 31 December 2011, EDF charged the cost of major inspections of plants to expenses, and recognised a provision for major inspections. A change in accounting method is applied from 1 January 2012, as EDF has opted to treat these items as components of fixed assets.

### 1.5.4 Property, plant and equipment operated under concession

In France, EDF is the operator for two types of public service concessions:

- public electricity distribution concessions in which the grantors are local authorities (municipalities or syndicated municipalities);
- hydropower concessions with the French State as grantor.

#### 1.5.4.1 Public electricity distribution concessions

EDF is the concession operator for the island networks located in Corsica and France's overseas departments.

The accounting treatment of concessions is based on the concession agreements, with particular reference to their special clauses. These agreements generally use standard concession rules deriving from the 1992 Framework Contract negotiated with the National Federation of Licensing Authorities (*Fédération Nationale des Collectivités Concédantes et Régies* - FNCCR) and approved by the public authorities (updated in 2007).

Assets used under concessions are reported in the balance sheet assets as property, plant and equipment operated under concession, regardless of their initial financing, at acquisition cost or their estimated value at the transfer date when supplied by the grantor. An offsetting liability is recognised for any assets supplied for nil consideration by concession grantors.

#### 1.5.4.2 Hydropower concessions

Hydropower concessions follow standard rules approved by decree.

Assets attributed to the hydropower concessions comprise hydropower generation equipment (dams, pipes, turbines, etc) and, in the case of recently-renewed concessions, electricity generation and switching facilities (alternators, etc).

The concession assets are recorded under property, plant and equipment operated under concession, at cost less accumulated depreciation. Depreciation is calculated over their useful life, which is generally identical to the term of the concession.

Additional depreciation is booked in complement to industrial depreciation for assets operated under concession that are to be returned for nil consideration at the end of the concession but whose useful life extends beyond the concession term.

## 1.6 Long-term asset impairment

At each closing date, EDF assesses whether there is any indication that an asset could have been significantly impaired. If so, an impairment test is carried out as follows:

- EDF measures any long-term asset impairment by comparing the carrying value of these assets, classified into cash-generating units where necessary, and their recoverable amount, usually determined using the discounted future net cash flow method;
- the discount rates used for these purposes are based on the weighted average cost of capital for each asset or group of assets concerned;
- future cash flows are based on medium-term plan projections over three years, and assumptions validated by the management.

## 1.7 Financial assets

### 1.7.1 Investments

Investments are carried at cost, except for certain investments acquired before 1 January 1977 which were revalued, replacing the original cost by the fair value at the end of 1976 if the fair value was higher.

Gains and losses on sales of investments are valued using the FIFO (first in first out) method.

In accordance with the Emergency Committee opinion 2007-C of 15 June 2007, transfer duties, fees and commissions and legal fees related to acquisitions of investments are included in the cost of acquisition of the asset. This concerns shares governed by article 39.1.5 of the French Tax Code.

Expenses of this type relating to other shares are included in expenses. Tax-regulated amortisation of acquisition costs is recorded in an excess depreciation account.

When the book value of investments is higher than their value in use, impairment is recorded equivalent to the difference.

The value in use of listed securities in non-consolidated entities is based on stock market price. For unlisted and listed securities in companies included in the EDF group consolidation, the value in use is determined by reference to equity or net adjusted consolidated assets, taking into account expert valuation information and information that has become known since the previous year-end when necessary.

### 1.7.2 INVESTMENT SECURITIES

EDF has set up two investment portfolios:

- the first comprises dedicated financial assets intended to finance the end of nuclear fuel cycle operations, for which provisions have been accrued. These assets are managed separately from other financial assets and investments in view of their specific objective, and comprise bonds, equities, collective investment funds and "reserved" funds built up by EDF solely for its own use;
- the second comprises securities acquired to generate a satisfactory return on investment in the medium to long term, without participating in the management of the companies concerned.

Investment securities also include treasury shares that cover obligations relating to debt instruments providing access to the company's capital, acquired under a liquidity contract with an investment services company or through an external operation or capital reduction, in application of CNC Emergency Committee opinion 98-D of 17 December 1998.

Shares are recorded at acquisition cost. In compliance with CRC regulation 99-03 and CNC Emergency Committee opinion 2005-J of 6 December 2005, transfer duties, professional fees, commissions, legal expenses and purchasing costs are all charged to expenses, under the option used for other investments and non-consolidated investments.

The investment portfolios (shares and bonds) are recorded at acquisition cost. If the carrying amount of a security is lower than the book value, the unrealised capital loss is fully written off through impairment without being netted against potential gains on other securities. The carrying amount of listed securities is assessed individually, taking the stock market price into account. For unlisted securities, the carrying amount is also assessed individually, mainly in consideration of the growth prospects of the companies concerned and their share prices.



### 1.7.3 Other financial assets

As part of Group activities, EDF grants short-term loans in foreign currencies to its subsidiaries. In order to reduce exposure to foreign exchange risks, the Group mainly finances these loans by short-term commercial paper issues in foreign currencies and in Euros, together with the use of currency hedging derivatives.

## 1.8 Inventories and work-in-progress

The initial cost of inventories includes all direct material costs (including the effect of hedging), labour costs and a share of indirect production costs. They are subsequently measured by the weighted unit average cost method.

### 1.8.1 Nuclear fuel and materials

Inventory accounts include:

- nuclear materials, whatever their form during the fuel production cycle;
- and fuel components in the warehouse or in the reactor.

The stated value of nuclear fuel and materials and work-in-progress is determined based on direct processing costs including materials, labour and subcontracted services (e.g. fluorination, enrichment, production, etc).

In accordance with the notion of "loaded fuel" as defined in the decision of 21 March 2007, the cost of inventories for fuel in reactors but not yet irradiated includes expenses for spent fuel management and long-term radioactive waste management. The corresponding amounts are taken into account in the relevant provisions.

Nuclear fuel consumption is determined by component (natural uranium, fluorination, enrichment, fuel assembly production) as a proportion of the expected output when the fuel is loaded in the reactor. These quantities are valued at weighted average cost of inventories, applied to each component. Inventories are periodically corrected in view of forecast spent quantities based on neutronic measurements and physical inventories.

### 1.8.2 Other fuels

Inventories of "other fuels" consist of fossil materials required for operation of the fossil-fired plants.

These inventories are measured using the weighted average cost method, applied to each component.

### 1.8.3 Operating materials and equipment

These inventories are measured at weighted average cost. Direct and indirect purchasing costs are included in the initial cost.

Impairment of spare parts supplied under a maintenance program is based on the turnover of these parts and the useful lives of generation units.

### 1.8.4 Gas held for trading

These inventories are valued at weighted average cost including direct and indirect purchasing costs, principally transmission costs.

Impairment of these inventories is determined based on the net realizable value, i.e. the future sale price.

## 1.9 Accounts receivable and marketable securities

### 1.9.1 Trade receivables

Trade receivables are stated at nominal value.

Trade receivables also include the value of unbilled receivables for energy already supplied.

A provision for expenses is recorded to cover the future cost related to energy not yet measured or billed.

Impairment is recorded when, based on the probability of recovery assessed according to the type of receivable, the carrying amount of receivables falls below their book value. Depending on the nature of the receivable, the risk associated with doubtful receivables is assessed individually or by experience-based statistical methods.

### 1.9.2 Marketable securities

Marketable securities are initially recorded as assets at acquisition cost, and restated at their value in use at year-end.

For listed securities, the value in use is equal to the year-end stock market price. For unlisted securities, the value in use is the probable trading value taking the company's growth prospects into consideration.

A provision is recorded to fully cover any unrealised losses, without netting against unrealised gains.

Gains and losses on sales of marketable securities are valued using the FIFO (first in first out) method.

Treasury shares purchased for attribution to employees under a specified plan are also classified as marketable securities. In accordance with CNC opinion 2008-17 of 6 November 2008 impairment based on market price is not recognised in respect of treasury shares.

## 1.10 Deferred charges

Bond redemption premiums are amortised on a straight-line basis over the term of the related bond (or each tranche of the bond to maturity in the case of serial bonds).

Commissions and external costs paid by EDF upon issuance of borrowings are spread on a straight-line basis over the term of the related instruments.

## 1.11 Translation of receivables and payables in foreign currencies

Foreign currency receivables and payables are translated into Euros at the year-end exchange rates. The resulting translation differences are recorded in the balance sheet in other receivables and other liabilities under "Unrealised foreign exchange gains" and "Unrealised foreign exchange losses". Provisions are recorded to cover all unrealised exchange losses on foreign currency borrowings not hedged for exchange risks. Unrealised gains are not included in the income statement.

Translation differences with respect to swaps hedging foreign currency borrowings are recorded under "Unrealised foreign exchange gains" and "Unrealised foreign exchange losses" as an offsetting entry to "Cash Instruments".

## 1.12 Tax-regulated provisions

The following items are recorded under this heading:

- excess depreciation on generation, transmission and distribution facilities computed using the declining-balance method;
- accelerated depreciation on the chimney sulphur removal facilities of fossil-fired plants;
- excess depreciation on software developed in-house by the company.

## 1.13 Special concession liabilities

These liabilities relate mostly to public electricity distribution concessions for the Island Energy Systems (IES), and hydropower concessions.

### 1.13.1 IES public electricity distribution concession liabilities

These liabilities represent the contractual obligations specific to the concession rules for public electricity distribution concessions, recognised in the liabilities as:

- rights in existing assets: these correspond to the grantor's right to recover all assets for nil consideration. This right comprises the value in kind of the facilities - the net book value of assets operated under concession - less any as yet unamortised financing provided by the operator;
- rights in assets to be replaced: these correspond to the operator's obligation to contribute to the financing of assets due for replacement. These non-financial liabilities comprise:
  - depreciation recorded on the portion of assets financed by the grantor;
  - the provision for renewal, exclusively for assets due for renewal before the end of the concession. This provision is included in provisions for expenses.

When assets are replaced, the provision and amortisation of the grantor's financing recorded in respect of the replaced item are eliminated and transferred to the rights in existing assets, since they are considered as the grantor's financing for the new asset. Any excess provision is taken to income.

During the concession, the grantor's rights in assets to be replaced are thus transferred upon the asset's renewal to become the grantor's rights in existing assets, with no outflow of cash to the benefit of the grantor.

### 1.13.2 Hydropower concession liabilities

These liabilities comprise:

- the value of assets remitted for nil consideration and contributions received;
- differences arising from revaluations in accordance with French legislation for fixed assets commissioned before 1 January 1959 and before 1 January 1977;
- and since 1 January 2009 (when implementation decree 2008-1009 of 26 September 2008 came into force) additional depreciation booked for facilities that are to be returned for nil consideration at the end of the concession but whose useful life extends beyond the concession term. This additional depreciation is based on the share of the assets' net book value at the end of the concession financed by the concession operator.

Following the changes made to the accounting treatment of hydropower concessions at 1 January 2009, the 1959 revaluation reserve is transferred to equity when the assets concerned are retired.

The net revaluation reserve generated by the 1976 revaluation is taken to income over the residual useful life of the assets concerned.

The value of assets remitted for nil consideration and contributions received are transferred to the income statement over their useful lives.

## 1.14 Provisions other than employee benefits provisions

EDF recognises a provision if the following three conditions are met:

- EDF has a present obligation (legal or constructive) towards a third party that arises from an event prior to the closing date;
- it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation;
- the obligation amount can be estimated reliably.

Provisions are determined based on EDF's estimate of the expected cost necessary to settle the obligation. Estimates are based on management data from the information system, assumptions adopted by EDF, and if necessary experience of similar transactions, or in some cases based on independent expert reports or contractor quotes. The various assumptions are reviewed for each closing of the accounts.

The company records any changes in estimates on long-term provisions as required by CRC regulation 2000-06 and Emergency Committee regulation 2005-H.

Provisions mainly cover the following:

- back-end nuclear cycle expenses: provisions for spent fuel management and long-term radioactive waste management are established for all fuels. This provision concerns all fuel in reactors, regardless of the extent of irradiation; it also covers management expenses for radioactive waste resulting from decommissioning of nuclear plants;
- costs for decommissioning power plants and losses relating to fuel in the reactor when the reactor is shut down (provision for last cores);
- future losses relating to multi-year agreements for the purchase and sale of energy:
  - losses on energy purchase agreements are measured by comparing the acquisition cost under the contractual terms with the forecast market price;
  - losses on energy sale agreements are measured by comparing the estimated income under the contractual terms with the cost of the energy to be supplied;
- unrealised foreign exchange losses;
- the future cost related to energy not yet measured or billed;
- costs of renewal of facilities operated under distribution concessions.

Provisions to cover back-end nuclear cycle expenses, expenses related to the decommissioning of power plants and last cores, and future losses relating to multi-year energy purchase and sale agreements are estimated based on discounted future cash flows.

The rate of inflation and the discount rate are based on economic and regulatory parameters specific to France.

The discount effect generated at each closing to reflect the passage of time is recorded as financial expenses.

A change in provisions resulting from a change in discount rates, a change in the disbursement schedule or a change in contractor quote is recorded:

- as a change in the corresponding assets if the provision was initially covered by balance sheet assets (decommissioning of plants still in

operation, long-term management of the radioactive waste resulting from such decommissioning, and last cores);

- in the income statement in all other cases.

In extremely rare cases, description of a specific litigation covered by a provision may be omitted from the notes to the financial statements if such disclosure could cause serious prejudice to the company.

If it is anticipated that all or part of the expenses covered by a provision will be reimbursed, the reimbursement is recognised under receivables if and only if EDF is virtually certain of receiving it.

In extremely rare situations, a provision cannot be booked due to lack of a reliable estimate. In such unusual cases, the obligation is mentioned in the notes as a contingent liability, unless there is little likelihood of an outflow of resources.

## 1.15 Provisions for employee benefits

EDF's employees are entitled to benefits both during and after their employment, in accordance with the statutory regulations for companies in the electricity and gas sector (IEG) in France.

### 1.15.1 Calculation and recognition of employee benefits

In application of the CNC Emergency Committee opinion 2000-A issued on 6 July 2000 and article 355.1 paragraph 2 of the General Chart of Accounts, EDF opted for recognition of post-employment benefits granted to personnel as of 1 January 2005.

Obligations under defined-benefit plans are calculated by the projected unit credit method, which determines the present value of entitlements earned by employees at year-end to post-employment benefits and long-term benefits, taking into consideration the country's specific economic conditions and expected wage increases.

For post-employment benefit obligations, this method takes the following factors into consideration, in compliance with CNC recommendation 2003-R01:

- career-end salary levels, with reference to employee seniority, projected salary levels at the time of retirement based on the expected effects of career advancement, and estimated trends in pension levels;
- retirement age, determined on the basis of relevant factors (such as years of service and number of children, taking into account the longer employee contribution period to qualify for a full pension);
- forecast numbers of pensioners, determined based on employee turnover rates and mortality data;
- reversion pensions where relevant taking into account both the life expectancy of the employee and his/her spouse and the marriage rate observed for the population of IEG (electricity and gas sector) status employees;
- a discount rate based on the yield on government bonds with a similar duration to the benefit obligations – French treasury bond OAT 2035, which has a term of 14 years consistent with the term of employee benefits – plus a spread calculated on high quality bonds issued by non financial companies, taking their duration into consideration.

The provision reflects the value of the fund assets that cover post-employment obligations, which is deducted from the value of the benefit obligation.

Any actuarial gain or loss on post-employment benefit obligations in excess of 10% (the "corridor") of the obligations or fund assets, whichever is the

highest, are recognised in the income statement progressively over the average residual working life of the company's employees.

For other long-term benefits, actuarial gains and losses and the full past service cost are directly included in the provision, without application of the "corridor" rule.

The net expense booked during the year for employee benefit obligations includes:

- the net cost of additional vested benefits, and the financial discount cost on existing benefits;
- the income corresponding to the expected return on fund assets;
- the change in actuarial gains and losses relating to long-term benefits and amortisation of actuarial gains or losses on post-employment benefits;
- the income or expense related to amendments/terminations of benefit plans or introduction of new plans.

Entitlements earned during the year are added to the provision, and discounting costs are included in financial expenses.

### 1.15.2 Post-employment benefit obligations

Since the financing reform for the IEG sector system took effect on 1 January 2005, the CNIEG (*Caisse Nationale des IEG*, the sector's specific pension body) has managed not only the special IEG pension system, but also the industrial accident, invalidity and death insurance system for the sector.

The CNIEG is a social security body governed by private law, formed by the law of 9 August 2004. It has legal entity status and reports to the French government, operating under the joint supervision of France's ministers for the Budget, Social Security and Energy.

Under the funding arrangements introduced by the law, EDF establishes pension provisions to cover entitlements not funded by France's standard systems (CNAV, AGIRC and ARRCO), to which the IEG system is affiliated, or by the CTA (*Contribution Tarifaire d'Acheminement*) levy on gas and electricity transmission and distribution services.

The provision for pensions thus includes:

- specific benefits of employees in the deregulated or competitive activities;
- specific benefits earned by employees from 1 January 2005 for the regulated activities (distribution) (past benefits are financed by the CTA levy);
- specific benefits of employees benefiting from early retirement before the standard legal retirement age.

CNIEG management expenses payable by EDF for the administration and payment of retired employees' pensions are also included.

In addition to pensions, other benefits are granted to IEG status former employees (not currently in active service), as detailed below:

- benefits in kind: article 28 of the IEG national statutes entitles all employees (active or inactive) to benefits in kind in the form of supplies of electricity or gas at the preferential "employee price". EDF's obligation for supplies of energy to EDF and GDF SUEZ employees corresponds to the probable present value of kWhs supplied to beneficiaries during their retirement, valued on the basis of the unit cost, taking into account the payment received under the energy exchange agreement with GDF SUEZ;
- retirement gratuities: these are paid upon retirement to employees due to receive the statutory old-age pension, or to their dependants if the employee dies before reaching retirement. These obligations are almost totally covered by an insurance policy;

- bereavement benefit: this is paid out upon the death of an inactive or disabled, in order to provide financial assistance for the expenses incurred at such a time (Article 26 – §5 of the National Statutes). It is paid to the deceased's principal dependants (statutory indemnity equal to three months' pension) or to a third party that has paid funeral costs (discretionary indemnity equal to the costs incurred);
- bonus pre-retirement paid leave: all employees eligible to benefit immediately from the statutory old-age pension and aged at least 55 at their retirement date are entitled to 18 days of bonus paid leave during the last twelve months of their employment;
- other benefits include study indemnities, additional retirement indemnities, time banking for pre-retirement leave, and pensions for personnel sent on secondment to companies not covered by the IEG system.

### 1.15.3 Other long-term benefit obligations

These benefits concern employees currently in service include:

- annuities following incapacity, invalidity, industrial accident or work-related illness; like their counterparts in the general national system, IEG employees are entitled to financial support in the event of industrial accident or work-related illness, and invalidity and incapacity annuities and benefits. The obligation is measured as the probable present value of future benefits payable to current beneficiaries, including any possible reversions;
- long-service awards;
- specific benefits for employees who have been in contact with asbestos.

## 1.16 Derivatives

### 1.16.1 Short-term foreign exchange rate derivatives

Short-term foreign exchange rate derivatives comprise:

- currency options;
- currency swaps;
- and forward currency contracts.

Gains and losses on instruments designated as hedges are recorded in the income statement symmetrically to the income and expenses recognised in respect of the hedged item.

This treatment applies to currency swaps used to hedge fuel supplies contracted in foreign currencies.

The treatment for instruments not qualifying as hedges is as follows:

- derivatives traded on organised or similar markets are stated at fair value at the year-end. The unrealised foreign exchange gains and losses are recorded in the financial result;
- for derivatives traded over the counter, a provision is recorded for unrealised losses and unrealised gains are not recognised;
- premiums paid or received on currency options are recognised in income at settlement.

Instruments outstanding at the year-end are included in off balance sheet commitments at the nominal value of the contracts.

### 1.16.2 Long-term interest rate and foreign exchange rate derivatives

One of the main objectives of exchange rate and interest rate risk management is to minimize their impact on equity and net income. For exchange rate risks, debts are as far as possible entered into in the local currency of the entity (parent company or subsidiary). If a transaction is undertaken in a different currency, a hedging policy (matching assets and liabilities) is set up wherever possible.

Long-term instruments consist of interest rate swaps and currency swaps.

Derivatives used in a hedging relationship are taken into account to adjust the foreign exchange result and interest expenses on a debt. If the exchange rate risk is totally hedged, no provision is recorded. If the risk is only partly hedged, a provision equivalent to the total unhedged unrealised exchange loss is recorded.

If no hedging relationship exists:

- derivatives traded on organised or similar markets are stated at fair value at the year-end. The unrealised foreign exchange gains and losses are recorded in the financial result;
- for derivatives traded over the counter, a provision is established for unrealised losses and unrealised gains are not recognised.

Instruments outstanding at the year-end are included in off balance sheet commitments at the nominal value of the contracts.

## 1.17 Commodity contrats

Forward financial instruments on commodities are traded for hedging purposes. Realised gains and losses on these operations are included in sales or in the cost of energy purchases, depending on the nature of the hedged item.

## 1.18 Environment

### 1.18.1 Greenhouse gas emission rights

EDF has been allocated greenhouse gas emission rights since 2005.

In compliance with CNC Emergency Committee opinion 2004-C of 23 March 2004, greenhouse gas emission rights are recorded as intangible assets (see note 1.4), with an offsetting entry in a special liability account under "Other liabilities".

Greenhouse gas emissions generate an expense and an obligation to surrender emission rights equivalent to the emissions produced. The rights allocated by the State give rise to reversals from the amounts in the special liability account, and recognition of income.

If the purchased emission rights held at the end of the year are higher than the forecast or actual emissions for the year, an impairment test must be applied to the excess, and impairment must be booked or partly or totally reversed where relevant.

As emission rights are allocated by period, rights receivable from the State for the period are reported in the notes as off balance sheet commitments received. When emission rights or credits are sold, the difference between the intangible asset's book value and sale price is recorded in income.

If the emission rights sold were previously allocated by the State but not yet utilised, the corresponding amount is reversed from the special liability account.

## 1.18.2 Energy savings certificates

In application of French law 2005-781 of 13 July 2005 defining the major lines of the national energy policy, which introduced a system of energy savings certificates for legal entities selling electricity, gas, heat or cold to end-users, and CNC Emergency Committee opinion 2006-D of 4 October 2006 defining the relevant accounting treatment under French GAAP, EDF's financial statements reflect the management of energy savings certificates.

Expenses incurred to meet the cumulative energy savings obligation are recorded as:

- tangible assets, if the action taken by the company concerns its own assets and the expenses qualify for recognition as an asset;

- expenses for the year incurred, if they do not meet the requirements for capitalisation or if the action taken is to encourage third parties to save energy.

Under the general framework of an energy savings certificates system:

- certificates obtained from the State after the action taken are not recognised in the accounts;
- purchases of energy savings certificate are included in:
  - expenses, if the purchases are made to meet the obligation;
  - intangible assets, if the certificates are purchased for resale (as there is no active market).

Certificates purchased, obtained or receivable from the State in support of the action taken are recorded in an off-balance sheet commodities.

## ➤ Note 2. Significant events and transactions

The main events and transactions in 2012 with a definite or potential significant impact on the financial statements are as follows.

### 2.1 Bond issues

EDF received funds from the following bond issues:

- €2 billion from a 10-year bond with annual coupon of 3.875%, on 18 January 2012;
- €1 billion from a 15-year bond with annual coupon of 4.125%, and £500 million from a 25-year bond with annual coupon of 5.5%, on 27 March 2012;
- €2 billion from a 10.5-year bond with annual coupon of 2.75%, on 10 September 2012.

### 2.2 Takeover of Edison

Once the conditions were fulfilled, on 24 May 2012 the EDF group and its Italian partners finalised the takeover of the energy group Edison. The principles of the final agreement were consistent with the preliminary agreement signed by the parties on 26 December 2011.

For the purposes of this operation, in June 2012 EDF increased the capital of Wagram 4 for the first time, by €845 million, in order to acquire control of Edison by purchasing Delmi's entire investment (50%) in Transalpina Di Energia (TdE).

In compliance with Italian stock market regulations, on 2 July 2012 the EDF Group launched a mandatory tender offer for the remaining Edison shares, at the price of €0.89 per ordinary share. For the purposes of this operation, EDF subscribed a further capital increase for Wagram 4, in the amount of €381 million.

The EDF group holds 97.40% of the capital and 99.48% of the voting rights of Edison at 31 December 2012.

### 2.3 Flamanville 3

In December 2012, EDF announced that the cost of constructing the Flamanville 3 project was to be revised upwards by €2 billion from the cost (of around €6 billion at constant 2008 values) announced in July 2011. The first marketable electricity output is scheduled for 2016.

In addition to the "lead unit" effect, certain other factors have affected the full cost of construction: changes in the boiler design, additional engineering studies, incorporation of new regulatory requirements and the lessons learned from Fukushima. The revised cost also reflects the additional expenditure associated with industrial contingencies, such as replacement of the supports for the reactor building polar crane and its effect on the work schedule, as well as the financial impact of extending construction deadlines.

### 2.4 Termination of the global nuclear partnership between EDF and ENEL

In November 2007, EDF and ENEL signed a series of agreements governing cooperation for nuclear operations, under the terms of which ENEL took a 12.5% stake in the Flamanville EPR project.

Given the changes in the economic environment and the project itself, as well as the discontinuation of the Italian nuclear revival programme following the June 2011 referendum, ENEL and EDF announced on 4 December 2012 that they were ending their cooperation. They consequently waived their respective options in each other's programmes, and ENEL withdrew from the Flamanville EPR project with effect from 19 December 2012. EDF therefore reimbursed ENEL's investment in the project, totalling €658 million including penalties. In return, EDF will have full rights to the electricity generated by Flamanville 3.



## ➤ Note 3. Regulatory events in 2012 with an impact on the financial statements

### 3.1 Agreement on recovery of deficits related to the CSPE

The Contribution to the Public Electricity Service (*Contribution au Service Public de l'Électricité* or CSPE) is a contribution set by the State and collected directly from the end-user of electricity to compensate for certain public service charges borne by EDF. It is intended to finance the rise in renewable energies, social tariffs and tariff equalisation.

Since 2007, the amount of CSPE collected has been unable to cover these charges, despite a system of regular rises in the CSPE introduced by the French finance law of 2011, and the resulting shortfall was affecting EDF's indebtedness.

Under the agreement reached with the French authorities and announced on 14 January 2013, EDF is to receive reimbursement of the receivable consisting of the CSPE shortfall at 31 December 2012 (€4.3 billion) and the costs of bearing this shortfall for EDF (€0.6 billion). The final amount of the receivable will only be set in 2013 after the deliberations of the French Market Regulator CRE (*Commission de Régulation de l'Énergie*) for recognition of the 2012 public service expenses.

A progressive reimbursement schedule for this €4.9 billion receivable was validated in the agreement. It runs until 2018, and bears interest at market rates (1.72%) which will be included in financial income in EDF's financial statements.

Following conclusion of this agreement, EDF recorded financial income of €0.6 billion at 31 December 2012, and transferred the CSPE receivable from "Other receivables" to "Financial loans and receivables" at an amount of €4.3 billion.

### 3.2 "NOME" law- european commission decision

On 12 June 2012 the European Commission announced that subject to conditions, it approved the State aid contained in the regulated electricity tariffs in France. In 2007 the Commission had opened an investigation into the regulated tariffs for sales to business customers (the "yellow" and "green" tariffs and the TaRTAM transition tariff). Since then, France's NOME law on the new electricity market organisation has modified the French legislative and regulatory context by discontinuing the TaRTAM transition tariff, programming the end of the "yellow" and "green" tariffs for the end of 2015 and setting up a scheme for regulated access to nuclear power (named ARENH, for *Accès Régulé à l'Électricité Nucléaire Historique*) for all suppliers of customers located in France.

Following an inquiry, the European Commission concluded that the business tariffs constitute State aid, but are nevertheless compatible with European law provided:

- the ARENH price remains at €42/MWh until the Commission gives approval of the methodology used to set the ARENH price;
- there is a gradual move towards cost-based pricing every year from the summer of 2012, until the "yellow" and "green" tariffs cease to exist at the end of 2015.

This decision marks the end of the European Commission's investigation concerning State aid.

## ➤ Note 4. Sales

Sales are comprised of:

(in millions of Euros)	2012	2011
Sales of energy <sup>(1)</sup>	41,897	40,096
Sales of goods and services	2,209	1,854
<b>SALES</b>	<b>44,106</b>	<b>41,950</b>

(1) Including a share of transport costs for sales of electricity and gas.

Sales were up by 5.1% from 2011. This increase principally concerns electricity sales in France, particularly reflecting weather effects and the regulated tariff increases of July 2011 and July 2012.

## ➤ Note 5. Operating subsidies

(in millions of Euros)

	2012	2011
<b>OPERATING SUBSIDIES</b>	<b>4,698</b>	<b>3,565</b>

Operating subsidies mainly comprise the subsidy received or receivable by EDF in respect of the "Contribution to the Public Electricity Service" (CSPE). In the financial statements, this compensation results in recognition of income of €4,687 million for 2012 (€3,556 million for 2011). The

increase is mainly explained by higher purchase volume obligations, largely attributable to photovoltaic and wind power, and fuel purchases in non-interconnected zones.

## ➤ Note 6. Reversals of provisions, amortisation and depreciation

(in millions of Euros)

	2012	2011
<b>Reversals of provisions for risks</b>	<b>79</b>	<b>78</b>
Pensions and similar obligations	1,137	766
Renewal of property, plant and equipment operated under concession	2	2
Spent fuel management	738	562
Long-term radioactive waste management	150	150
Decommissioning of power plants	257	287
Other provisions for expenses <sup>(1)</sup>	113	444
<b>Reversals of provisions for expenses</b>	<b>2,397</b>	<b>2,211</b>
<b>Reversals of impairment</b>	<b>465</b>	<b>148</b>
<b>TOTAL</b>	<b>2,941</b>	<b>2,437</b>

(1) Including a €173 million reversal in 2011 from the provision for the transition tariff (TaRTAM) system.

## ➤ Note 7. Other operating income

(in millions of Euros)

	2012	2011
<b>OTHER OPERATING INCOME</b>	<b>560</b>	<b>647</b>

Other operating income mainly consists of the greenhouse gas emission rights allocated for the current year by the French State and used by EDF, in application of CNC Emergency Committee opinion 2004-C of 23 March 2004.

## ➤ Note 8. Purchases and other external expenses

(in millions of Euros)	2012	2011
Fuel purchases used <sup>(1)</sup>	4,265	3,116
Energy purchases <sup>(2)</sup>	12,013	10,696
Services and other purchases used <sup>(3)</sup>	18,527	18,396
<b>PURCHASES AND OTHER EXTERNAL EXPENSES</b>	<b>34,805</b>	<b>32,208</b>

(1) Fuel purchases used include costs relating to raw materials for energy generation (nuclear fuels, fissile materials, coal, oil, and gas), and purchases of services related to the nuclear fuel cycle.

(2) The rise in energy purchases primarily concerns purchase obligations for photovoltaic and wind power.

(3) This item notably consists of distribution network access fees invoiced by the subsidiary ERDF, including the rise in the TURPE network access tariff (Tarif d'Utilisation des Réseaux Publics d'Électricité).

## ➤ Note 9. Taxes other than income taxes

(in millions of Euros)	2012	2011
Taxes on salaries and wages	145	142
Energy-related taxes <sup>(1)</sup>	1,006	1,398
Local Economic Contribution	466	457
Property taxes	362	355
Other taxes	254	257
<b>TAXES OTHER THAN INCOME TAXES</b>	<b>2,233</b>	<b>2,609</b>

(1) A receivable of €98 million was recorded in 2012 after the CRE's decision of 9 October 2012 setting the final 2011 charge for the TaRTAM transition tariff system. In 2011, a contribution of €316 million was booked in connection with the TaRTAM system, which ended when the ARENH principle came into force on 1 July 2011.

## ➤ Note 10. Personnel expenses

(in millions of Euros)	2012	2011
Salaries and wages	3,687	3,600
Social contributions	2,551	2,161
<b>PERSONNEL EXPENSES</b>	<b>6,238</b>	<b>5,761</b>

The increase in personnel expenses results primarily from changes in social contributions, in application of decree 2011-2087 of 30 December 2011.

	2012			2011
	IEG status	Other	Total	Total
Executives	27,441	348	27,789	26,030
Operational, supervisory and technical staff	36,342	172	36,514	36,449
<b>AVERAGE WORKFORCE</b>	<b>63,783</b>	<b>520</b>	<b>64,303</b>	<b>62,479</b>

Average workforce numbers are reported on a full-time equivalent basis.

## ➤ Note 11. Depreciation and amortisation

(in millions of Euros)	2012	2011
Amortisation of intangible assets	116	104
Depreciation on property, plant and equipment:		
■ owned by EDF	2,004	1,770
■ operated under concession <sup>(1)</sup>	203	195
<b>Total depreciation and amortisation on fixed assets</b>	<b>2,323</b>	<b>2,069</b>
Amortisation of bond issuance expenses and other capitalised expenses	31	31
<b>TOTAL</b>	<b>2,354</b>	<b>2,100</b>

(1) Depreciation concerns the Island Energy System's "Public Distribution" concessions and "Hydropower concessions".

## ➤ Note 12. Provisions and impairment

(in millions of Euros)	2012	2011
<b>Provisions for risks</b>	<b>141</b>	<b>90</b>
Pensions and similar obligations	708	515
Renewal of assets operated under concession	17	16
Management of spent nuclear fuel	432	396
Long-term management of radioactive waste	46	36
Decommissioning of power plants and last cores <sup>(1)</sup>	912	11
Other provisions for expenses	113	218
<b>Provisions for expenses</b>	<b>2,228</b>	<b>1,192</b>
<b>Depreciation</b>	<b>213</b>	<b>176</b>
<b>TOTAL</b>	<b>2,582</b>	<b>1,458</b>

(1) €610 million associated with revision of the estimated costs for decommissioning permanently shut-down nuclear power plants in France (UNGG power plants, Creys-Malville, Brennilis and Chooz A). The cost and timetable have been revised in the light of past industrial feedback, contingencies and changes in regulations.

## ➤ Note 13. Other operating expenses

(in millions of Euros)	2012	2011
Greenhouse gas emissions	146	201
Other operating expenses	843	863
<b>TOTAL</b>	<b>989</b>	<b>1,064</b>

## ➤ Note 14. Financial result

(in millions of Euros)	2012	2011
Income from investments <sup>(1)</sup>	2,478	1,047
Income from other securities and receivables related to fixed assets <sup>(2)</sup>	1,039	344
Interest and similar income <sup>(3)</sup>	408	827
Reversal of provisions and transfert of charges <sup>(4)</sup>	975	424
Foreign exchange result	93	112
Income on sales of marketable securities	27	61
Financial amortisation and provisions <sup>(5)</sup>	(3,015)	(3,344)
Interest and similar expenses <sup>(6)</sup>	(2,023)	(2,158)
<b>FINANCIAL RESULT</b>	<b>(18)</b>	<b>(2,687)</b>

(1) In 2012, €964 million of dividends were received from EDEV and €540 million of dividends were received from EDF International. There was no equivalent transaction in 2011.

(2) In 2012, this item mainly includes income of €629 million for the cost of bearing the shortfall in the CSPE (see note 3.1).

(3) Most of the change results from €319 million debt waiver by the CEA (Atomic Energy Commission), relating to a loan from the CEA to EDF for construction of the Creys-Malville plant.

(4) In 2012 this item mainly comprises reversals from provisions:

- on shares in La Gérance Générale Foncière for €212 million following the capital increase at EDF Immo by transferring these shares as a contribution in kind,
- on dedicated assets for €317 million (€84 million in 2011).

(5) This item chiefly includes the discount expenses for long-term provisions (nuclear and employee benefit provisions). The higher discount effect in 2012 on provisions for back-end nuclear cycle, decommissioning and last cores generated a €244 million expense related to revision of the discount rate (see note 30.3.1). In 2011, allocations to provisions principally concerned shares in Veolia (€272 million), shares in GGF (€212 million) and dedicated assets (€293 million).

(6) The change in this item is mainly attributable to expenses related to short-term financial liabilities.

## ➤ Note 15. Exceptional result

At 31 December 2012, exceptional items resulted in net income of €196 million, the main items of which are the following:

- net reversals of excess tax depreciation on property, plant and equipment and intangible assets amounting to €199 million;
- a loss of €212 million on GGF shares, after GGF and SOFILO shares were transferred to EDF Immo as a contribution in kind, offset by a reversal of an equivalent amount of impairment on GGF shares in the financial result;

- a gain of €86 million on the transfer to EDEV of the shares in EDF Énergies Nouvelles previously held by EDF, corresponding to the difference between the value of the EDEV shares and the net book value of the EDF Énergies Nouvelles shares.

At 31 December 2011, exceptional items resulted in net income of €197 million, the main item being net reversals of excess tax depreciation on property, plant and equipment and intangible assets amounting to €185 million.



## ➤ Note 16. Income taxes

### 16.1 Tax group

Since 1 January 1988, EDF and certain subsidiaries have formed a group subject to the tax consolidation system existing under French tax legislation (articles 223 A to 223 U of the French Tax Code). The tax consolidation group comprises 110 subsidiaries in 2012, including RTE Réseau de Transport d'Électricité, ERDF, EDF International and companies that joined the tax group this year such as EDF Énergies Nouvelles and its subsidiaries.

### 16.2 Income tax payable

Under article 223 A of the French Tax Code, EDF, as the head of the tax consolidated group, is the sole entity responsible for payment of income taxes and additional related contributions (social contributions, exceptional contribution equal to 5% of income taxes, and 3% contribution on dividend distributions).

The tax consolidation agreement between the members of the tax group stipulates that the arrangement must be neutral in effect. In application of this principle, each subsidiary pays the consolidating company a contribution to the group income tax equivalent to the tax it would have paid had it been taxed separately.

The tax consolidation agreement between EDF and the subsidiaries included in the tax group requires EDF to reimburse loss-making subsidiaries for the tax saving generated by their losses, as and when the entities concerned make taxable profits, in compliance with the standard rules for use of taxable losses.

The company at the head of the tax group, EDF, recorded an income tax expense of €460 million for 2012. The breakdown is as follows:

- €413 million for the taxable profit of 2012;
- €122 million for the net exceptional income;
- €(75) million for adjustments resulting from the tax consolidation.

### 16.3 Deferred taxes

Deferred taxes are not recognised in the individual accounts of EDF. Deferred taxes result from differences between the accounting bases and tax bases of items. They generally arise as a result of timing differences in the recognition of income and expenses:

- deferred tax assets reflect expenses which will be tax deductible in future years or losses carried forward which will reduce taxable income in the future;
- deferred tax liabilities reflect either advance tax deduction of future accounting expenses or accounting revenues that will be taxable in future years and will increase the tax basis.

Changes in deferred taxes are as follows:

(in millions of Euros)	31/12/2012	31/12/2011	Change
<b>1. Timing differences generating a deferred tax asset</b>			
- Non-deductible provisions <sup>(1)</sup>	(10,980)	(11,720)	740
- Financial instruments and unrealised exchange gains	(3,295)	(3,104)	(191)
- Other	(246)	(255)	9
<b>Total deferred tax assets subject to the standard rate</b>	<b>(14,521)</b>	<b>(15,079)</b>	<b>558</b>
<b>2. Timing differences generating a deferred tax liability</b>			
- Financial instruments and unrealised exchange losses	2,875	2,859	16
- Other	501	-	501
<b>Total deferred tax liabilities subject to the standard rate</b>	<b>3,376</b>	<b>2,859</b>	<b>517</b>
- Capital gains not yet taxed, net of capital losses	79	79	-
<b>Total deferred tax liabilities subject to reduced rate</b>	<b>79</b>	<b>79</b>	<b>-</b>
<b>BASIS FOR DEFERRED TAXES</b>	<b>(11,066)</b>	<b>(12,141)</b>	<b>1,075</b>
Net future tax asset at standard rate	(3,838)	(4,207)	369
Net future tax liability at reduced rate	1	1	-

(1) Mainly concerning post-employment benefits granted to personnel.

## ➤ Note 17. Gross values of intangible and tangible fixed assets

(in millions of Euros)	Gross value at 31/12/2011	Increases	Decreases	Gross value at 31/12/2012
Software	557	112	40	629
Other <sup>(1)</sup>	446	319	275	490
<b>Intangible assets</b>	<b>1,003</b>	<b>431</b>	<b>315</b>	<b>1,119</b>
Land	115	5	3	117
Buildings	9,096	197	65	9,228
Nuclear power plants	46,833	2,278	1,003	48,108
Machinery and plant other than networks	10,061	999	119	10,941
EDF-owned networks	781	73	1	853
Other	1,098	156	52	1,202
<b>Property, plant and equipment owned by EDF</b>	<b>67,984</b>	<b>3,708</b>	<b>1,243</b>	<b>70,449</b>
Land	38	1	-	39
Buildings	8,861	168	3	9,026
Machinery and plant other than networks	1,343	49	68	1,324
Concession networks	2,093	107	27	2,173
Other	11	-	-	11
<b>Property, plant and equipment operated under concession <sup>(2)</sup></b>	<b>12,346</b>	<b>325</b>	<b>98</b>	<b>12,573</b>
Tangible assets <sup>(3)</sup>	6,769	4,211	3,283	7,697
Intangible assets	1,014	274	123	1,165
Advances and progress payments on orders	1,368	494	-	1,862
<b>Assets in progress</b>	<b>9,151</b>	<b>4,979</b>	<b>3,406</b>	<b>10,724</b>
<b>TOTAL</b>	<b>90,484</b>	<b>9,443</b>	<b>5,062</b>	<b>94,865</b>

(1) The €319 million increase includes €166 million related to greenhouse gas emission rights allocated by the French State in 2012, and the €(275) million decrease comprises €(201) million for 2011 rights surrendered to the State in 2012.

(2) Assets operated under concession concern the Island Energy Systems and hydropower concessions.

(3) Investments in 2012 mainly concerned nuclear equipment for existing plants, construction of the EPR at Flamanville and renovation of fossil-fired plants. The reinforced management plan also enhanced monitoring of general maintenance expenditure and scheduled checks carried out at regular intervals. These checks qualify as major inspections and the related costs are capitalised.

## ➤ Note 18. Depreciation and amortisation on intangible and tangible fixed assets

(in millions of Euros)	Accum. at 31/12/2011	Increases	Decreases	Accum. at 31/12/2012
Software	238	102	40	300
Other	72	13	3	82
<b>Intangible assets</b>	<b>310</b>	<b>115</b>	<b>43</b>	<b>382</b>
Buildings and land developments	5,874	244	55	6,063
Nuclear power plants	32,012	1,705	1,296	32,421
Machinery and plant other than networks	6,945	472	114	7,303
EDF-owned networks	307	32	-	339
Other	704	87	50	741
<b>Property, plant and equipment owned by EDF</b>	<b>45,842</b>	<b>2,540</b>	<b>1,515</b>	<b>46,867</b>
Buildings and land developments	5,586	153	2	5,737
Machinery and plant other than networks	975	20	27	968
Concession networks	810	51	6	855
Other	11	-	-	11
<b>Property, plant and equipment operated under concession</b>	<b>7,382</b>	<b>224</b>	<b>35</b>	<b>7,571</b>
<b>TOTAL</b>	<b>53,534</b>	<b>2,879</b>	<b>1,593</b>	<b>54,820</b>

## ➤ Note 19. Dedicated assets

### 19.1 Regulations

The French law of 28 June 2006 and its implementing decrees require assets, known as dedicated assets, to be set aside for secure financing of nuclear plant decommissioning expenses and long-term storage expenses for radioactive waste (spent fuel and fuel recovered from decommissioning). These regulations govern the way dedicated assets are built up, management of the funds themselves and their governance. These assets are clearly identified and managed separately from the company's other financial assets and investments. They are also subject to specific monitoring and control by the Board of Directors and the administrative authorities.

The initial aim of these laws was to cover the full present cost of long-term nuclear obligations by 29 June 2011 and at all times after that date. The NOME law enacted in 2010 introduced a 5-year extension, subject to certain conditions, of the deadline for constitution of dedicated assets.

The decree of 29 December 2010 made RTE shares eligible for dedicated assets, subject to certain conditions and administrative authorisation. Since the conditions were fulfilled and authorisation was received, 50% of EDF's shares in RTE were allocated to dedicated assets on 31 December 2010.

### 19.2 Portfolio contents and measurement

EDF's dedicated assets consist of diversified bond and equity investments, and since 31 December 2010, 50% of the shares in RTE.

Given the applicable regulations, these dedicated assets are a highly specific category of assets.

#### 19.2.1 Diversified bond and equity investments

Certain dedicated assets take the form of bonds held directly by EDF. The rest comprise specialised collective investment funds on leading international markets, managed by independent asset management companies. They take the form of open-end funds and "reserved" funds established solely for the use of the company (which does not participate in the fund management).

This portfolio is structured and managed according to a strategic allocation defined by the Board of Directors and reported to the administrative

authorities. The strategic allocation is designed to meet the overall objective of long-term coverage of obligations, and determines the structure and management of the portfolio as a whole. It also takes into consideration international stock market cycles (for which the statistical inversion generally observed between equity market cycles and bond market cycles - as well as between geographical areas - has led EDF to define an overall composite benchmark indicator), and continuation of the long-term investment policy.

## 19.2.2 RTE shares

By allocating RTE shares to dedicated assets, EDF diversified its dedicated asset portfolio and reduced its volatility, since infrastructure assets such as RTE offer predictable returns that have low correlation with other categories of financial assets such as equities and bonds.

Since RTE remains fully-owned by EDF, the shares remain classified as investments. The value of the shares allocated to dedicated assets is €2,393 million at 31 December 2012. This value corresponds to the net consolidated value of 50% of the Group's investment in RTE.

## 19.2.3 Valuation of the dedicated asset portfolio

Dedicated assets are classified in the balance sheet according to their accounting nature: investments, investment securities, marketable securities. They are valued under the accounting principles presented in note 1.

Details of the portfolio at 31 December 2012 are as follows:

	31/12/2012		31/12/2011	
	Net book value	Fair value or realisable value	Net book value	Faire value or realisable value
<i>(in millions of Euros)</i>				
RTE shares	2,015	2,393	2,015	2,310
Investments securities	13,864	15,218	12,058	12,734
Other financial investments	-	-	1	1
<b>Dedicated asset portfolio - Investments</b>	<b>15,879</b>	<b>17,611</b>	<b>14,074</b>	<b>15,045</b>
Marketable securities	-	-	578	576
<b>Dedicated asset portfolio before hedge</b>	<b>15,879</b>	<b>17,611</b>	<b>14,652</b>	<b>15,621</b>
Hedging instruments and other	-	15	-	(20)
<b>DEDICATED ASSET PORTFOLIO AFTER HEDGE</b>	<b>15,879</b>	<b>17,626</b>	<b>14,652</b>	<b>15,601</b>

Net book value and fair value include unmatured accrued interest.

## 19.2.4 Changes in the dedicated asset portfolio over 2012

The cash allocations to the dedicated asset portfolio were suspended in October 2011 in view of market conditions, but resumed in January 2012. They amounted to €737 million for the year 2012 (€315 million in 2011).

In a context marked by the European sovereign debt crisis, EDF continued its prudent investment policy for these financial instruments in 2012, and as a

result its exposure at year-end was carefully controlled for Italy and negligible for the most severely affected Euro-zone countries (Greece, Portugal, Ireland and Spain). EDF also adjusted its position on German government bonds that were considered to offer insufficient returns.

Withdrawals totalling €350 million were made, equivalent to payments made in respect of the long-term nuclear obligations to be covered in 2012 (€378 million in 2011).

## 19.3 Present cost of long-term nuclear obligations

Long-term nuclear obligations concerned by the regulations for dedicated assets are included in EDF's financial statements at the following values:

	31/12/2012	31/12/2011
<i>(in millions of Euros)</i>		
Provision for long-term radioactive waste management	7,113	6,722
Decommissioning provisions for nuclear plants	12,578	11,366
Provisions for last cores - portion of long-term radioactive waste management future costs	434	389
<b>PRESENT COST OF LONG-TERM NUCLEAR OBLIGATIONS</b>	<b>20,125</b>	<b>18,477</b>

## ➤ Note 20. Financial assets

### 20.1 Movements in investments

(in millions of Euros)	Gross value at 31/12/2011	Increases	Decreases	Change	Reclassification	Gross value at 31/12/2012
Investments <sup>(1)</sup>	52,657	8,473	3,168	-	-	57,962
Receivables related to investments <sup>(2)</sup>	1,045	153	1,000	-	-	198
Investment securities	13,172	8,000	6,462	-	-	14,710
Other investments	34	134	128	-	-	40
Loans	15	1	2	-	-	13
Loans to subsidiaries <sup>(3)</sup>	4,681	1,618	2,769	69	-	3,599
Other deposits and guarantees	134	38	95	-	-	77
Receivable CSPE <sup>(4)</sup>	-	629	-	-	4,250	4,879
<b>Total</b>	<b>71,738</b>	<b>19,046</b>	<b>13,624</b>	<b>69</b>	<b>4,250</b>	<b>81,478</b>

(in millions of Euros)	Gross value at 31/12/2011	Increases	Decreases	Change	Reclassification	Gross value at 31/12/2012
Provisions on investments and related receivables <sup>(5)</sup>	(1,150)	(9)	364	-	-	(795)
Provisions on investment securities <sup>(6)</sup>	(823)	(48)	331	-	-	(540)
<b>Total</b>	<b>(1,973)</b>	<b>(57)</b>	<b>695</b>	<b>-</b>	<b>-</b>	<b>(1,335)</b>

<b>NET VALUE</b>	<b>69,765</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>80,143</b>
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(1) The net change in this item mainly results from the following operations undertaken in 2012:

- subscription to EDEV's capital increase in cash (€ 1,900 million) and by contributing shares in EDF Énergies Nouvelles (€1,542 million),
- derecognition of shares in EDF Énergies Nouvelles in connection with EDEV's capital increase (€1,456 million),
- subscription to EDF Immo's capital increase (€1,361 million),
- derecognition of shares in Gérance Générale Foncière (GGF) (€472 million) and SOFILO (€1,088 million) after they were contributed in kind for the capital increase at EDF Immo,
- subscription to C3's capital increase (€2,169 million),
- subscription to Wagram 4's capital increase (€1,491 million),
- derecognition of shares in Centrale Sidérurgique de Richemont (CSR) (€152 million) after it was absorbed by EDF.

(2) Reimbursement of the €1 billion advance made to EDEV in 2011.

(3) Loans to subsidiaries at 31 December 2012 total €3,599 million, including €1,501 million for EDEV and €1,174 million for RTE.

(4) After the agreement with the French authorities, share of the receivable with reimbursement schedule and application of interest.

(5) Including a €212 million reversal from provisions established in 2011 on GGF shares following the transfer of GGF and SOFILO shares to EDF Immo as a contribution in kind. The €152 million provision on shares in CSR was reversed after CSR was absorbed by EDF.

(6) A reversal of €317 million at 31 December 2012 concerned dedicated assets.



## 20.2 Subsidiaries and investments of at least 50% of capital

	Gross book value of shares owned	Impairment recorded 31/12/2012	% capital owned	Equity 31/12/2011	Net income 2011	Dividends received 2012	Sales 2011
<i>(in millions of Euros)</i>							
<b>I. Subsidiaries</b>							
<b>* Holding companies</b>							
EDEV	4,710	-	100	1,595	46	964	1
EDF International	25,930	-	100	24,265	829	540	-
MNTC	2,095	275	100	2,006	3	-	-
EDF Production Électrique Insulaire SAS	496	-	100	432	-	-	nm
EDF Holding SAS	1,950	-	100	2,251	247	235	-
Société C3	9,896	-	100	7,739	nm	-	-
Wagram 4	3,168	425	100	1,629	nm	-	-
EDF Immo	1,361	-	100	-	-	245	-
<b>* Industrial and commercial companies</b>							
<b>France</b>							
Centrale Électrique Rhénane de Gambenheim	3	-	50	11	-	-	5
Dalkia Investissement	200	-	50	262	38	19	3
RTE Réseau de Transport d'Électricité <sup>(1)</sup>	4,030	-	100	5,316	233	140	4,197
Électricité Réseau Distribution France (ERDF)	2,700	-	100	3,543	589	308	12,262
<b>Other countries</b>							
Emosson	14	14	50	115	-	-	30
Rheinkraftwerk Iffezheim (RKI)	3	-	50	94	2	1	13
Forces Motrices du Châtelot	1	-	50	12	nm	-	4
<b>* Financial companies</b>							
Sapar Finance	3	-	100	1	-	-	nm
<b>* Other (GIE EIFER)</b>	<b>77</b>	<b>76</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>TOTAL I</b>	<b>56,637</b>	<b>790</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>2,452</b>	<b>-</b>

nm: not material (less than €500,000).

(1) Including 50% of shares allocated to dedicated assets.

## 20.3 Subsidiaries and investments under 50% of capital

(in millions of Euros)	Gross book value of shares owned	Impairment recorded at 31/12/2012	% du capital owned	Equity 31/12/2011	Net income 2011	Dividends received 2012
<b>I. Subsidiaries</b>						
Total I Carried forward	56,637	790				2,452
<b>II Investments</b>						
II.1 Companies in which EDF has an interest of between 10% and 50%						
* Industrial and commercial companies						
<b>France</b>						
Dalkia International	425	-	24	1,570	39	-
Dalkia Holding	897	-	34	1,335	83	26
Total II.1	1,322	-				26
II.2 Companies in which EDF has an interest of less than 10%						
Other companies						
	2	-	-	-	-	-
<b>Other countries</b>						
Forces Motrices de Mauvoisin	1	-	10	97	4	nm
Total II.2	3	-				-
Total II	1,325	-	-	-	-	26
Total investments, gross (I + II)	57,962	790	-	-	-	2,478
<b>TOTAL INVESTMENTS, NET</b>	<b>57,172</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

nm : not material (less than €500,000).

## 20.4 Investment securities portfolio

(in millions of Euros)	At start of year			At year-end		
	Gross book value	Net book value	Fair value	Gross book value	Net book value	Fair value
<b>VALUE OF INVESTMENT SECURITIES</b>	<b>13,172</b>	<b>12,357</b>	<b>13,073</b>	<b>14,710</b>	<b>14,177</b>	<b>15,531</b>

At 31 December 2012, the investment securities portfolio is mainly comprised of dedicated assets (€14,053 million) and an equities portfolio (€657 million).

## 20.5 Variation in treasury shares

A share repurchase program authorised by the General Shareholders' Meeting of 9 June 2006 was implemented by the Board of Directors, within the limits of 10% of the total number of shares making up the Company's capital. The initial duration of the program was 18 months, renewed for 12 months then by tacit agreement every year.

Under this share repurchase program, for which a liquidity contract exists as required by the market regulator AMF, 8,398,898 shares were acquired during 2012 for a total of €134 million, and 7,413,159 shares were sold for a total of €119 million.

(in millions of Euros)	Gross value at 31/12/2011	Increases	Decreases	Gross value at 31/12/2012
<b>TREASURY SHARES</b>	<b>23</b>	<b>134</b>	<b>(127)</b>	<b>30</b>

At 31 December 2012, treasury shares included in the investment securities portfolio represent 2,110,739 shares with total value of €30 million.

## ➤ Note 21. Related companies

### 21.1 Relations with subsidiaries

	EDF's receivables <sup>(1)</sup>		EDF's liabilities <sup>(1)</sup>		Financial expenses	Financial income (excluding dividends)
	Loans	Trade receivables	Net liabilities included in current account	Trade liabilities		
(in millions of Euros)						
<b>Companies</b>						
RTE	1,174	252	-	149	-	65
EDEV	1,501	-	-	-	-	6
EDF Energy	-	151	-	227	-	5
EDF Énergies Nouvelles	420	-	-	-	-	29
EDF International	-	-	-	-	-	-
ERDF	-	146	-	2,212	-	-
EDF Trading	284	870	-	1,121	-	7
Dalkia International	94	-	-	-	-	8
EDF Polska	76	-	-	-	-	2
EDF Energy UK Ltd	-	-	-	-	-	2
Current account ERDF	-	-	-	266	-	-
Group cash management agreement with subsidiaries	-	-	7,776	-	(14)	-
Tax consolidation agreement <sup>(2)</sup>	-	198	-	1,094	-	-
Agreement for investment of subsidiaries' cash surpluses	-	-	5,823	-	(71)	-

(1) Receivables and payables of more than €50 million.

(2) Including €877 million of liabilities concerning EDF International.

## 21.2 Relations with the French State and state-owned entities

### 21.2.1 Relations with the French State

The French State holds 84.4% of the capital of EDF at 31 December 2012, and is thus entitled in the same way as any majority shareholder to control decisions that require approval by the shareholders.

In accordance with the legislation applicable to all companies having the French State as their majority shareholder, EDF is subject to certain inspection procedures, in particular economic and financial inspections by the State, audits by the French Court of Auditors (*Cour des Comptes*) and Parliament, and verifications by the French General Finance Inspectorate (*Inspection Générale des Finances*).

Under an agreement entered into by the French State and EDF on 27 July 2001 concerning the monitoring of external investments, procedures exist for prior approval by the French State or notification (advance or otherwise) of the State in respect of certain planned investments, additional investments or disposals by EDF. This agreement also introduced a procedure for monitoring the results of external growth operations.

The public service contract between the French State and EDF was signed on 24 October 2005. This contract is intended to form the framework for public service missions entrusted by the lawmaker to EDF for an unlimited period. The law of 9 August 2004 does not stipulate the duration of the contract.

EDF, like other electricity producers, also participates in the multi-annual generation investment program defined by the minister in charge of energy, which sets objectives for the allocation of generation capacity.

Finally, the French State intervenes through the regulation of electricity and gas markets, particularly for authorisation to build and operate generation facilities, establishment of sales tariffs for customers that have stayed on the regulated tariffs, transmission and distribution tariffs, and also determination of the ARENH price in accordance with the NOME law, and the level of the Contribution to the Public Electricity Service (*Contribution au Service Public de l'Électricité* or CSPE).

### 21.2.2 Relations with public sector entities

EDF enters into normal business transactions with public sector entities, mainly for electricity supplies.

Transactions with AREVA concern uranium purchases, uranium enrichment, nuclear fuel purchases, plant maintenance operations, equipment purchases and transportation, storage, processing and recycling services for spent fuel.

On 15 December 2008 EDF and AREVA NC signed an agreement for uranium enrichment services to cover the period 2013-2032.

On 19 December 2008 EDF and AREVA signed a framework agreement for spent fuel management contracts concerning periods after 2007. In execution of this agreement, EDF and AREVA signed two contracts on 12 July 2010 entitled the "EDF-AREVA NC Processing-Recycling agreement" and the "Protocol for recovery and conditioning of EDF waste, and the final shutdown and decommissioning of the AREVA NC plant at La Hague".

EDF and AREVA have signed the following contracts for 1,300 MW nuclear power plants:

- a contract for supply of 32 steam generators and a contract for renewal of the control/command systems in 2011;
- a contract for services related to replacement operations for the first steam generators, in August 2012.

On 31 July 2012 EDF and AREVA MINES also signed two contracts for supplies of natural uranium concentrate, covering the period 2014-2035.

EDF also holds shares in AREVA valued at €123 million at 31 December 2012.

## ➤ Note 22. Inventories and work-in-progress

	Raw materials		Other raw materials	Work-in-progress for production of goods and services	Total
	Nuclear fuel and materials	Other fuels			
(in millions of Euros)					
Gross value at 31/12/2011	7,436	535	851	18	8,840
Provisions at 31/12/2011	(13)	-	(158)	-	(171)
Net value at 31/12/2011	7,423	535	693	18	8,669
Gross value at 31/12/2012	7,836	463	996	21	9,316
Provisions at 31/12/2012	(14)	-	(162)	-	(176)
NET VALUE AT 31/12/2012	7,822	463	834	21	9,140

## ➤ Note 23. Receivables and prepaid expenses

(in millions of Euros)	Liquidity			Gross value at 31/12/2012	Gross value at 31/12/2011
	< 1 year	1 to 5 years	> 5 years		
Advances to subsidiaries and affiliates	198	-	-	198	1,045
Loans	4	5	4	13	15
Other investments <sup>(1)</sup>	2,858	799	19	3,676	4,815
CSPE receivables <sup>(2)</sup>	-	4,086	793	4,879	-
<b>Fixed asset receivables</b>	<b>3,060</b>	<b>4,890</b>	<b>816</b>	<b>8,766</b>	<b>5,875</b>
- Trade receivables					
Amounts billed	2,499	-	-	2,499	2,547
Unbilled receivables <sup>(3)</sup>	10,686	-	-	10,686	9,373
- Other operating receivables <sup>(4)</sup>	3,638	65	3	3,706	6,694
<b>Current asset receivables</b>	<b>16,823</b>	<b>65</b>	<b>3</b>	<b>16,891</b>	<b>18,614</b>
<b>Cash instruments <sup>(5)</sup></b>	<b>1,151</b>	<b>1,393</b>	<b>257</b>	<b>2,801</b>	<b>2,807</b>
<b>Prepaid expenses <sup>(6)</sup></b>	<b>535</b>	<b>93</b>	<b>707</b>	<b>1,335</b>	<b>603</b>
<b>Advances and progress payments on orders</b>	<b>683</b>	<b>55</b>	<b>168</b>	<b>906</b>	<b>796</b>
<b>TOTAL</b>	<b>22,252</b>	<b>6,496</b>	<b>1,951</b>	<b>30,699</b>	<b>28,695</b>

(1) Chiefly loans to subsidiaries.

(2) Following conclusion of the agreement with the French authorities, the receivable corresponding to the shortfall in the CSPE at 31 December 2012 was transferred from "Other receivables" to "Financial loans and receivables" at an amount of €4,250 million (see note 3.1). Financial income of €629 million corresponding to the cost for EDF of bearing this shortfall is also recorded under the same heading.

(3) Mainly receivables for energy supplied and not billed.

(4) Including €2,034 million of receivables on the French State for taxes and €997 million for the Contribution to the Public Electricity Service (CSPE). Following the agreement with the French authorities (see note 3.1), an amount of €4,250 million corresponding to the shortfall in the CSPE at 31 December 2012 was reclassified as a receivable related to fixed assets.

(5) Unrealised gains on foreign exchange instruments.

(6) In 2012, prepaid expenses include past payments for future services related to spent fuel management, with a corresponding amount in provisions related to nuclear generation (see note 30).

## ➤ Note 24. Marketable securities

(in millions of Euros)	31/12/2012	31/12/2011	Change
Treasury shares marketable securities	3	3	-
Euro investment funds	3,282	2,190	1,092
Negotiable debt instruments (Euros or other currencies) maturing within 3 months <sup>(1)</sup>	392	777	(385)
Negotiable debt instruments (Euros or other currencies) maturing after 3 months <sup>(1)</sup>	1,315	2,722	(1,407)
Negotiable debt instruments medium and long-term	394	394	-
Euro bonds	3,515	2,908	607
Other marketable securities	53	56	(3)
<b>Gross value</b>	<b>8,954</b>	<b>9,050</b>	<b>(96)</b>
<b>Provisions</b>	<b>(7)</b>	<b>(1)</b>	<b>(6)</b>
<b>NET VALUE</b>	<b>8,947</b>	<b>9,049</b>	<b>(102)</b>

(1) At 31 December 2011, short-term negotiable debt instruments in Euros include €578 million of dedicated assets (no equivalent at 31 December 2012).



## ➤ Note 25. Variation in cash and cash equivalents reported in the cash flow statement

<i>(in millions of Euros)</i>	<b>31/12/2012</b>	31/12/2011	Change
Marketable securities	8,954	9,050	(96)
Cash and cash equivalents	3,685	3,194	491
<b>Sub-total in balance sheet assets</b>	<b>12,639</b>	<b>12,244</b>	<b>395</b>
Euro investment funds	(3,282)	(2,190)	(1,092)
Negotiable debt instruments (Euro) maturing after 3 months	(1,315)	(2,722)	1,407
Bonds	(3,515)	(2,908)	(607)
Marketable securities - treasury shares	(3)	(3)	-
Accrued interest on marketable securities maturing after 3 months	(53)	(56)	3
Negotiable debt instruments medium and long-term	(394)	(394)	-
<b>Marketable securities included in financial assets in the cash flow statement</b>	<b>(8,562)</b>	<b>(8,273)</b>	<b>(289)</b>
Cash advances to subsidiaries (cash pooling agreements) included in "other operating receivables" in the balance sheet	2	4	(2)
Cash advances from subsidiaries (cash pooling agreements) included in "other operating liabilities" in the balance sheet	(7,778)	(7,075)	(703)
<b>CASH AND CASH EQUIVALENTS, CLOSING BALANCE IN THE CASH FLOW STATEMENT</b>	<b>(3,699)</b>	<b>(3,100)</b>	<b>(599)</b>
Elimination of the effect of currency fluctuations			(24)
Elimination of net financial income on cash and cash equivalents			(68)
<b>NET VARIATION IN CASH AND CASH EQUIVALENTS IN THE CASH FLOW STATEMENT</b>			<b>(691)</b>

## ➤ Note 26. Unrealised foreign exchange gains and losses

Net unrealised foreign exchange gains and losses represent a net unrealised loss of €175 million. Unrealised exchange losses include €279 million related to unhedged borrowings in pounds sterling and €33 million related

to borrowings in US dollars, while unrealised exchange gains include €128 million related to a borrowing in pounds sterling partly hedged by currency swaps.

## ➤ Note 27. Changes in equity

	Capital	Reserves and premiums	Retained earnings and interim dividends	Net income	Investment subsidies received	Tax-regulated provisions	Total equity
<i>(in millions of Euros)</i>							
<b>At 31/12/2010</b>	<b>924</b>	<b>10,879</b>	<b>3,863</b>	<b>1,492</b>	<b>127</b>	<b>6,734</b>	<b>24,019</b>
Allocation of 2010 net income	-	-	420	(420)	-	-	-
Dividend distribution	-	-	3	(1,072)	-	-	(1,069)
2011 net income	-	-	-	1,118	-	-	1,118
Capital increase on 24/06/2011	6	300	-	-	-	-	306
Capital reduction on 28/09/2011	(6)	(318)	-	-	-	-	(324)
Interim dividend	-	-	(1,053)	-	-	-	(1,053)
Other changes	-	(46)	-	-	44	(185)	(187)
<b>At 31/12/2011</b>	<b>924</b>	<b>10,815</b>	<b>3,233</b>	<b>1,118</b>	<b>171</b>	<b>6,549</b>	<b>22,810</b>
Allocation of 2011 net income	-	-	46	(46)	-	-	-
Dividend distribution	-	-	-	(1,072)	-	-	(1,072)
2012 net income	-	-	-	3,566	-	-	3,566
Interim dividend	-	-	(1,053)	-	-	-	(1,053)
Other changes	-	(13)	434	-	19	(226)	214
<b>AT 31/12/2012</b>	<b>924</b>	<b>10,802</b>	<b>2,660</b>	<b>3,566</b>	<b>190</b>	<b>6,323</b>	<b>24,465</b>

### 27.1 Share capital

At 31 December 2012, the share capital amounted to €924,433,331, comprising 1,848,866,662 fully subscribed and paid-up shares with nominal value of €0.50 each, owned 84.4% by the French State, 13.6% by the public (institutional and private investors) and 1.9% by current and retired Group employees, with 0.1% held by EDF as treasury shares.

Article 24 of the law of 9 August 2004 requires the State to hold more than 70% of the capital of EDF at all times.

### 27.2 Dividends

The General Shareholders' Meeting of 24 May 2012 decided to distribute a dividend of €1.15 per share in circulation in respect of 2011. Interim dividends of €0.57 per share had been paid out on 16 December 2011, and the balance of €0.58 per share amounting to a total of €1,072 million was paid out on 6 June 2012.

On 22 November 2012, the Board of Directors decided to distribute an interim dividend of €0.57 per share in respect of 2012 amounting to a total of €1,053 million, paid out in cash on 17 December 2012.

In keeping with the amendment to the company's articles of association proposed at the General Shareholders' Meeting of 24 May 2011, shareholders who have held their shares continuously for at least 2 years at the year-end date and still hold them at the dividend distribution date are entitled to a 10% increase in their dividends. The number of shares eligible for this increase cannot be more than 0.5% of the company's capital for a single shareholder. This amendment will take effect for the payment in 2014 of the dividend for the year 2013.

### 27.3 Changes in equity

At 31 December 2012, the €1,655 million increase in equity was attributable to the following:

- €3,566 million of net income for 2012;
- €(1,072) million for the balance of dividend distributions from 2011 net income as decided at the General Shareholders' meeting of 24 May 2012 (€0.58 per share, paid on 6 June 2012);
- €(1,053) million for the interim dividend of €0.57 per share paid in cash from 2012 net income on 17 December 2012;
- €214 million in other changes, including €(226) million in tax-regulated provisions and €431 million impact on retained earnings of the change in accounting method for major plant inspections as of 1 January 2012.

At 31 December 2011, the €1,209 million decrease in equity was attributable to the following:

- €1,118 million of net income for 2011;
- €(1,069) million for the balance of dividend distributions from 2010 net income as decided at the General Shareholders' meeting of 24 May 2011 (€0.58 per share, paid on 6 June 2011);
- €(1,053) million for the interim dividend of €0.57 per share paid in cash from 2011 net income on 16 December 2011;
- €(18) million resulting from the change in the share premium account resulting from operations associated with the public cash or exchange offer for shares in EDF Énergies Nouvelles and cancellation in treasury shares;
- €(187) million in other changes, mainly corresponding to net reversals of €(185) million from tax-regulated provisions.

## ➤ Note 28. Special concession liabilities

<i>(in millions of Euros)</i>	31/12/2012	31/12/2011
Value in kind of assets	99	100
Revaluation difference	998	1,012
Additional depreciation	71	51
<b>Rights in hydropower assets</b>	<b>1,168</b>	<b>1,163</b>
Value in kind of assets	1,368	1,327
Unamortised financing by the operator	(799)	(772)
Amortisation of grantor financing	251	237
Contributions received for concessionary plant assets under construction	11	13
<b>Rights in public distribution concession assets <sup>(1)</sup></b>	<b>831</b>	<b>805</b>
<b>TOTAL</b>	<b>1,999</b>	<b>1,968</b>

(1) Rights in public distribution concession assets concern the Island Energy Systems (IES).

## ➤ Note 29. Provisions for risks and contingent liabilities

### 29.1 Provisions for risks

	31/12/2011	Increases		Decreases			Others	31/12/2012
<i>(in millions of Euros)</i>		Operating	Financial	Utilisations	Reversals	Financial		
Provisions for unrealised exchange losses	295	-	132	-	-	(87)	-	340
Provisions for losses on contracts	148	112	19	(55)	-	-	(75)	149
Provisions for other risks	110	29	2	(19)	(5)	-	75	192
<b>PROVISIONS FOR RISKS</b>	<b>553</b>	<b>141</b>	<b>153</b>	<b>(74)</b>	<b>(5)</b>	<b>(87)</b>	<b>-</b>	<b>681</b>

## 29.2 Contingent liabilities

### Individual training entitlement (*Droit individuel à la formation* or DIF)

The French law of 4 May 2004 allows each employee an individual entitlement to a minimum of 20 hours of training per year, which may be accumulated over 6 years. The company agreement with unions signed on 24 February 2006 defines the conditions for exercising this entitlement, listing the types of training eligible. Expenses for such training are recorded as incurred.

DIF entitlements earned at 31 December 2012 total 6,326,051 hours, including 6,246,649 for which no application has been made.

### General Network – Rejection of the European Commission's appeal

On 15 December 2009 the European Union Court cancelled the European Commission's decision of 16 December 2003 that had classified the tax treatment of provisions created for the renewal of the General Network at the time of EDF's capital increase in 1997 as state aid, and ordered repayment to the French State of the discounted value, i.e. €1,224 million (paid by EDF in February 2004). The State therefore reimbursed this amount to EDF on 30 December 2009, then in February 2010 the European Commission filed an appeal before the Court of Justice of the European Union.

On 5 June 2012, the Court of Justice of the European Union issued a decision rejecting the European Commission's appeal and upheld the European Union Court's decision of 15 December 2009.

### Tax inspections

In 2008 and 2009 EDF underwent a tax inspection covering the tax years 2004, 2005 and 2006.

One of the grounds for reassessment concerns the tax-deductibility of the provision for annuities following work-related accidents and illness. EDF is contesting the tax authorities' position on the deductibility of this provision. In late 2011 the National Commission for direct taxes and

sales taxes issued an opinion in favour of EDF on the main grounds for reassessment resulting from the inspection covering the years 2004 to 2006, notably confirming the deductibility of the provision for annuities following work-related accidents and illness. If the outcome of this dispute is unfavourable, the financial risk (income taxes) for EDF could amount to some €150 million.

The reassessment demand was sent to the company in late 2011. A complaint applying for suspension of this demand was sent to the tax administration in 2012 to initiate the formal dispute procedure, but no answer had been received by the end of the year.

During 2010, a further inspection was begun of the years 2007 and 2008, and in late 2011 EDF was notified of a proposed rectification for 2008. EDF is contesting most of the tax reassessments, amounting to approximately €900 million, concerning deductibility of certain long-term liabilities. The administration confirmed these reassessments in 2012. The Company considers it is likely to win this dispute, and no provision has been established for the principal grounds for tax reassessment.

The tax administration has also proposed a reassessment following inspections of 2008 and 2009, concerning an interest-free advance made by EDF to its indirect subsidiary Lake Acquisitions Ltd in connection with the acquisition of British Energy. EDF is contesting this reassessment.

Finally, another inspection has started in 2012 related to years 2009 and 2010. Late in the year the Company received a proposed rectification, of a non-significant amount, for 2009. EDF is contesting this proposed rectification.

### Labour litigation

EDF is party to a number of labour lawsuits with employees and employment inspectors, primarily regarding the calculation and implementation of legislation regarding working hours. EDF estimates that none of these lawsuits, individually, is likely to have a significant impact on its profits and financial position. However, because they concern situations likely to involve a large number of EDF's employees in France, any increase in such litigations could present a risk with a potentially significant negative impact on the company's financial results. The number of these litigation cases is nonetheless small at the time of preparing this report.

## ➤ Note 30. Provisions for back-end nuclear cycle, plant decommissioning and last cores

Provisions for back-end nuclear cycle expenses, plant decommissioning and last cores are calculated under the principles presented in note 1.14, and comply with the instructions of the law of 28 June 2006 and its implementing provisions. In compliance with the regulation on secure financing of nuclear expenses:

- EDF books provisions to cover all obligations related to the nuclear facilities it operates;
- EDF is building up a portfolio of dedicated assets to secure long-term obligations.

The relevant expenses are estimated based on the economic conditions of the year-end. They are spread over a forecast disbursement schedule and valued in Euros on the basis of the expected conditions at the time of payment, through application of a forecast long-term inflation rate. They are then discounted to present value for calculation of the provisions, using a nominal discount rate.

### 30.1 Provisions for the back-end nuclear cycle

Changes in provisions for the back-end nuclear cycle break down as follows:

	31/12/2011	Increases		Decreases		Others <sup>(2)</sup>	31/12/2012
(in millions of Euros)		Operating	Financial <sup>(1)</sup>	Utilisations	Reversals		
Provisions for spent fuel management	9,143	432	640	(717)	(21)	21	9,498
Provisions for long-term radioactive waste management	6,722	46	486	(150)	-	9	7,113
<b>PROVISIONS FOR BACK-END NUCLEAR CYCLE</b>	<b>15,865</b>	<b>478</b>	<b>1,126</b>	<b>(867)</b>	<b>(21)</b>	<b>30</b>	<b>16,611</b>

(1) Financial discounting expenses.

(2) This corresponds to the portion of fuel in the reactor but not yet irradiated, with an associated offsetting entry in inventories.

Expenses are estimated based on the economic conditions at the year-end, discounted to present value as follows:

	31/12/2012		31/12/2011	
(in millions of Euros)	Costs based on economic conditions at year-end	Amounts in provisions at present value	Costs based on economic conditions at year-end	Amounts in provisions at present value
Provisions for spent fuel management	15,250	9,498	14,844	9,143
Provisions for long-term radioactive waste management	24,562	7,113	23,801	6,722
<b>PROVISIONS FOR BACK-END NUCLEAR CYCLE</b>	<b>39,812</b>	<b>16,611</b>	<b>38,645</b>	<b>15,865</b>



### 30.1.1 Provisions for spent fuel management

This covers services in connection with the following:

- removal of spent fuel from EDF's generation centers, reception, and interim storage;
- processing, including conditioning and storage of recyclable matter and waste resulting from this processing.

Processing expenses exclusively concern spent fuel that can be recycled in existing facilities, including the portion in reactors but not yet irradiated.

Expenses are calculated based on forecast physical flows at the balance sheet date. Valuation is based on the contracts signed with AREVA.

The provision for spent fuel management mainly reflects the cost of future services (with a corresponding amount recorded in prepaid expenses), and the favourable effect of revision of certain costs associated with interim storage of spent fuel.

### 30.1.2 Provisions for long-term radioactive waste management

This includes future expenses for:

- removal and storage of radioactive waste resulting from decommissioning of regulated nuclear installations operated by EDF;
- removal and storage of radioactive waste packages resulting from spent fuel processing at La Hague;
- long-term and direct storage of spent fuel that cannot be recycled on an industrial scale in existing installations: plutonium or uranium fuel derived from enriched processing, fuel from Creys-Malville and Brennilis;
- EDF's share of the costs of studies, coverage, shutdown and surveillance of storage centres:
  - existing centres, for very low-level waste, and low and medium-level waste;
  - new centres to be opened, for long-life low-level waste and long-life medium and high-level waste.

The volumes of waste concerned by provisions include packages of existing waste and all waste to be conditioned, resulting from plant decommissioning or spent fuel processing at La Hague (based on all fuel in reactors at 31 December, spent or otherwise). These volumes are regularly reviewed, in keeping with the data declared for the purposes of the national waste inventory undertaken by the French agency for radioactive waste management ANDRA (*Agence nationale pour la gestion des déchets radioactifs*).

The provision for long-life medium and high-level waste is the largest component of the provisions for long-term radioactive waste management. The French Law of 28 June 2006 on the sustainable management of radioactive materials and waste has confirmed EDF's assumption of geological storage. Provisions are based on that assumption.

Since 2005, the gross value and disbursement schedules for forecast expenses have been based on a scenario of industrial geological waste storage, following conclusions presented in the first half of 2005 by the task force set up by the French department for Energy and Raw Materials (*Direction Générale de l'Énergie et des Matières Premières* – DGEMP, which has since become the French department for Energy and Climate – *Direction Générale de l'Énergie et du Climat* or DGECC) comprising members representing the relevant Government departments (DGEMP, the French State investment agency APE and the Budget Department), ANDRA and the producers of waste (EDF, AREVA, CEA). The approach applied by EDF to the working party's conclusions is reasonable and coherent with information available internationally.

In 2011 ANDRA and waste producers set up a partnership aiming to facilitate completion of the geological storage project by leveraging on all the skills of the French nuclear industry. This partnership will conduct joint studies on targeted issues and organize an interface between the ANDRA project team and nuclear operators to help them make well-informed, relevant contributions to governance of the project. The ANDRA has drawn up specifications for early conceptional studies, taking into consideration many of the design options proposed by the waste producers, either as the benchmark or as variations. It should be able to propose an estimate of storage costs by late 2013 at the earliest, after including the recommendations of the French Nuclear Safety Authority (*Autorité de Sécurité Nucléaire* or ASN), the National Evaluation Commission (*Commission Nationale d'Évaluation* or CNE) and the public debate. After consulting waste producers and the ASN, France's minister for Energy is due to decide on the value of these costs and make a public announcement.

Regarding the provision for long-life low-level waste, the search for a storage site has been suspended following withdrawal of two sites selected by ANDRA. ANDRA is due to submit a report to the French government with various proposals for management of this type of waste, and the conditions for resuming the search for a site. Despite significant delays and the financial risks involved, the calculation method for the provision for storage of long-life low-level waste remains unchanged and should cover most of the alternative scenarios that are currently being examined jointly by EDF and ANDRA.

## 30.2 Provisions for decommissioning and last cores

The change in decommissioning and last core provisions breaks down as follows:

	31/12/2011	Increases		Decreases		Others	31/12/2012
(in millions of Euros)		Operating	Financial <sup>(1)</sup>	Utilisations	Reversals		
Decommissioning provisions for fossil-fired plants	476	24	25	(47)	(5)	49	522
Decommissioning provisions for nuclear plants	11,366	808	592	(205)	-	17	12,578
Provisions for last cores	2,012	80	101	-	-	-	2,193
<b>TOTAL</b>	<b>13,854</b>	<b>912</b>	<b>718</b>	<b>(252)</b>	<b>(5)</b>	<b>66</b>	<b>15,293</b>

(1) Financial discounting expenses.

Expenses are estimated based on the economic conditions at the year-end, discounted to present value as follows:

	31/12/2012		31/12/2011	
(in millions of Euros)	Costs based on economic conditions at year-end	Amounts in provisions at present value	Costs based on economic conditions at year-end	Amounts in provisions at present value
Decommissioning provisions for fossil-fired plants	707	522	662	476
Decommissioning provisions for nuclear plants	22,174	12,578	21,108	11,366
Provisions for last cores	3,887	2,193	3,888	2,012
<b>TOTAL PROVISIONS FOR DECOMMISSIONING AND LAST CORES</b>	<b>26,768</b>	<b>15,293</b>	<b>25,658</b>	<b>13,854</b>

### 30.2.1 Decommissioning provisions for fossil-fired and hydropower plants

The expenses related to decommissioning of these power plants are based on regularly updated studies based on estimated future costs, measured by reference to the charges recorded on past operations and the most recent estimates for plants still in operation.

The provision recorded at 31 December 2012 reflects the most recent known contractor quotes and commissioning of new generation assets.

For plants still in operation, a tangible fixed asset has been created against the provision.

### 30.2.2 Decommissioning provisions for nuclear power plants

These provisions concern the decommissioning of pressurised water reactor (PWR) nuclear power plants currently in operation, and nuclear power plants that have been permanently shut down.

They are estimated on the assumption that once decommissioning is complete, the sites will be returned to their original state and the land reused for industry.

For nuclear power plants currently in operation (PWR plants with 900 MW, 1300 MW and N4 reactors)

Provisions are estimated based on a 1991 study by the French Ministry of Trade and Industry, which set an estimated benchmark cost in €/MW, confirming the assumptions defined in 1979 by the PEON commission. This estimate was confirmed by a further study carried out by EDF in 1999 focusing on a specific site, and a further valuation in 2009 involving the following steps:

- measurement of the decommissioning cost for a PWR plant with four 900 MW units, taking into consideration the most recent developments in regulations, past experience in decommissioning of shut-down plants and recommendations issued by the ASN;
- a review of the schedule for decommissioning operations over time;
- determination of the rules for extrapolation of costs for the entire fleet of PWR plants in operation.

International intercomparison studies carried out with an external specialist firm support the results of this study.

This study resulted in a figure for decommissioning costs that confirms the amount of the provision booked to date, and validates the benchmark costs used, expressed in €/MW.

For permanently shut-down nuclear power plants (UNGG power plants, Creys-Malville, Brennilis and Chooz A)

The provision is based on contractor quotes for decommissioning, newly updated in 2012. The costs and schedule have been revised to reflect industrial experience, contingencies and changes in regulations. This update has led to a €610 million increase in the provision for decommissioning of nuclear power plants, which is included in expenses for 2012.

The new valuation is based on the following key assumptions:

- that decommissioning will take place as soon as possible (this is unchanged from the previous quote);
- that long-life medium-level waste will be stored in a packaging and interim storage installation for radioactive waste (ICEDA) due to open in 2015 (rather than 2013 as previously estimated), until it can be placed in deep underground storage for which the assumptions are unchanged;
- that the facility for storing graphite waste will be available from 2025 (instead of 2019 as previously estimated);
- that the decree for full decommissioning of Brennilis will be obtained by the end of 2018.

## 30.2.3 Provision for last cores

This provision covers the future expenses resulting from scrapping fuel that will only be partially used when the reactor is shut down. It is measured based on:

- the cost of the loss on fuel in the reactor that is not totally spent at the time of final reactor shutdown and cannot be reused due to technical and regulatory constraints;
- the cost of fuel processing, disposal and waste storage operations. These costs are valued in a similar way to provisions for spent fuel management and long-term radioactive waste management.

These unavoidable costs are components of the cost of nuclear reactor shutdown and decommissioning. As such, they are fully covered by provision from the commissioning date and an asset associated with the provision is recognised.

## 30.3 Discounting of provisions related to nuclear generation and sensitivity analyses

### 30.3.1 Discount rate

Since 31 December 2012, EDF applies a nominal discount rate of 4.8% in calculating its provisions, together with assumed inflation of 1.9%, resulting in an effective rate of close to 2.9% (previously, the nominal discount rate applied was 5.0% with assumed inflation of 2.0%, i.e. a real rate of close to 3.0%).

#### Calculation of the discount rate

The discount rate is determined based on long-series data for a sample of bonds with maturities as close as possible to that of the liability. However, some expenses covered by these provisions will be disbursed over periods significantly longer than the duration of instruments generally traded on the financial markets.

The benchmark used to determine the discount rate is the sliding 10-year average of the return on French treasury bonds over the longest time horizons, plus the spread of corporate bonds rated A to AA, which include EDF.

The assumed inflation rate is determined in line with the forecasts provided by consensus and expected inflation based on the returns on inflation-linked bonds. In response to changes in these criteria, EDF adjusted its assumed inflation to 1.9% at 31 December 2012.

#### Revision of the discount rate and regulatory limit

The methodology used to determine the discount rate gives priority to long-term trends in rates, in keeping with the long-term horizon for disbursements. The discount rate is therefore revised in response to structural developments in the economy leading to medium and long-term changes.

The discount rate applied must also comply with the two limits set down by the decree of 23 February 2007 and the decision of 21 March 2007. It must remain below:

- a regulatory maximum "equal to the arithmetic average over the forty-eight most recent months of the constant 30-year rate (*TEC 30 ans*), observed on the last date of the period concerned, plus one point";
- and the expected rate of return on assets covering the liability (dedicated assets).

In order to respect the regulatory limit, the discount rate was reduced to 4.8% at 31 December 2012.

### 30.3.2 Analyses of sensitivity to macro-economic assumptions

This sensitivity to assumptions concerning costs, inflation rate, long-term discount rate, and disbursement schedules can be estimated through comparison of the gross amount estimated under year-end economic conditions with the discounted value of the amount.

This approach can be complemented by estimating the impact of a change in the discount rate on the discounted value.

In application of article 11 of the decree of 23 February 2007, the following table reports these details for the main components of provisions for the back-end nuclear cycle, decommissioning of nuclear plants and last cores for EDF:

	Amounts in provisions at present value		Sensitivity to discount rate			
	31/12/2012	31/12/2011	2012		2011	
(in millions of Euros)			0.20%	-0.20%	0.25%	-0.25%
<b>Back-end of nuclear cycle</b>						
■ Spent fuel management	9,498	9,143	(165)	174	(200)	213
■ Long-term radioactive waste management	7,113	6,722	(361)	403	(412)	471
<b>Decommissioning and last cores</b>						
■ Decommissioning of power plants	12,578	11,366	(458)	479	(544)	576
■ Last cores	2,193	2,012	(66)	70	(81)	87
<b>TOTAL</b>	<b>31,382</b>	<b>29,243</b>	<b>(1,050)</b>	<b>1,126</b>	<b>(1,237)</b>	<b>1,347</b>

## ➤ Note 31. Provisions for employee benefits

Changes in provisions for employee benefits were as follows:

	31/12/2011	Increases		Decreases		31/12/2012
(in millions of Euros)		Operating expenses <sup>(1)</sup>	Financial expenses	Operating reversals <sup>(2)</sup>	Financial reversals <sup>(3)</sup>	
Provisions for post-employment benefits	9,852	519	896	(1,050)	(345)	9,872
Provisions for long-term benefits	742	189	35	( 87)	-	879
<b>PROVISIONS FOR EMPLOYEE BENEFITS</b>	<b>10,594</b>	<b>708</b>	<b>931</b>	<b>(1,137)</b>	<b>(345)</b>	<b>10,751</b>

(1) Including past service cost of €347 million, amortisation of actuarial losses amounting to €266 million, vested benefits of €88 million and unvested benefits of €8 million.

(2) Including €944 million for employers' contributions, €29 million for actuarial gains and €164 million for reversals of vested benefits.

(3) Including €345 million for the expected return on fund assets.

### Details of changes in provisions

	Obligations	Net value of fund assets	Obligations net of fund assets	Unrecognised past service cost	Unrecognised actuarial gains and losses	Provision in the balance sheet
(in millions of Euros)						
Balance at 31/12/2011	18,767	(7,132)	11,635	(74)	(967)	10,594
Net expense for 2012	1,252	(345)	907	(43)	237	1,101
Unrecognised actuarial gains and losses	5,244	(602)	4,642	(1)	(4,641)	-
Contributions to funds	-	(325)	(325)	-	-	(325)
Benefits paid	(939)	320	(619)	-	-	(619)
<b>BALANCE AT 31/12/2012</b>	<b>24,324</b>	<b>(8,084)</b>	<b>16,240</b>	<b>(118)</b>	<b>(5,371)</b>	<b>10,751</b>

The experience adjustment represents an actuarial gain of €423 million.

The change in unrecognised actuarial gains and losses mainly relates to the lower discount rate for long-term obligations to employees, which was reduced to 3.5% at 31 December 2012 (5% at 31 December 2011).

### Post-employment and long-term employee benefit expenses

(in millions of Euros)	31/12/2012	31/12/2011
Current service cost	347	343
Interest expenses (discount effect)	931	899
Expected return on fund assets	(345)	(321)
Amortisation of unrecognised actuarial gains and losses - post-employment benefits	53	59
Change in actuarial gains and losses - long-term benefits	184	76
Effect of plan curtailment or settlement	-	1
Past service cost - vested benefits	(77)	-
Past service cost - unvested benefits	8	8
<b>NET CHARGES RELATED TO POST-EMPLOYMENT BENEFITS AND LONG-TERM BENEFITS</b>	<b>1,101</b>	<b>1,065</b>
including:		
Operating expenses <sup>(1)</sup>	515	487
Financial expenses	586	578

(1) €708 million of increases to operating provisions, net of reversals for actuarial gains and losses (€29 million) and of €164 million for vested benefits.

## 31.1 Provisions for post-employment benefits

Details of these provisions are shown below:

	31/12/2011	Increases		Decreases		31/12/2012
		Operating expenses	Financial expenses	Operating reversals	Financial reversals	
<i>(in millions of Euros)</i>						
<b>Provisions for post-employment benefits</b>						
Pensions	8,258	310	743	(901)	(329)	8,081
CNIEG expenses	411	5	17	(18)	-	415
Benefits in kind (energy)	798	74	93	(62)	-	903
Retirement gratuities	(3)	30	24	(44)	(16)	(9)
Other benefits	388	100	19	(25)	-	482
<b>TOTAL</b>	<b>9,852</b>	<b>519</b>	<b>896</b>	<b>(1,050)</b>	<b>(345)</b>	<b>9,872</b>

	Obligations	Net value of fund assets	Unrecognised past service cost	Unrecognised actuarial gains and losses	Provision in the balance sheet
<i>(in millions of Euros)</i>					
<b>Provisions for post-employment benefits at 31/12/2012</b>					
Pensions	19,218	(7,668)	-	(3,469)	8,081
CNIEG expenses	428	-	-	(13)	415
Benefits in kind (energy)	2,558	-	-	(1,655)	903
Retirement gratuities	582	(403)	(65)	(123)	(9)
Other benefits	660	(13)	(54)	(111)	482
<b>TOTAL</b>	<b>23,446</b>	<b>(8,084)</b>	<b>(119)</b>	<b>(5,371)</b>	<b>9,872</b>

The increase in obligations in 2012 mainly relates to the lower discount rate (3.5% at 31 December 2012 compared to 5% at 31 December 2011).

	Obligations	Net value of fund assets	Unrecognised past service cost	Unrecognised actuarial gains and losses	Provision in the balance sheet
<i>(in millions of Euros)</i>					
<b>Provisions for post-employment benefits at 31/12/2011</b>					
Pensions	14,912	(6,762)	-	108	8,258
CNIEG expenses	338	-	-	73	411
Benefits in kind (energy)	1,875	-	-	(1,077)	798
Retirement gratuities	501	(357)	(72)	(75)	(3)
Other benefits	399	(13)	(2)	4	388
<b>TOTAL</b>	<b>18,025</b>	<b>(7,132)</b>	<b>(74)</b>	<b>(967)</b>	<b>9,852</b>

The increase in 2011 in obligations related to the electricity/gas benefit principally resulted from the fact that the employer has borne the rise in electricity taxes (including the CSPE and local taxes on electricity). This effect has been considered as a change in assumptions, and therefore leads to an increase in unrecognised actuarial gains and losses.



## 31.2 Provisions for other long-term benefits for current employees

The amount of obligations for other long-term benefits awarded to current employees is identical to the corresponding balance sheet provisions. Details are as follows:

	31/12/2011	Increases		Decreases	31/12/2012
		Operating expenses	Financial expenses	Operating reversals	
<i>(in millions of Euros)</i>					
<b>Provisions for other long-term benefits for current employees</b>					
Annuities following work-related accident and illness	632	167	30	(72)	757
Long service awards	85	16	4	(10)	95
Other	25	6	1	(5)	27
<b>TOTAL</b>	<b>742</b>	<b>189</b>	<b>35</b>	<b>(87)</b>	<b>879</b>

## 31.3 Fund assets

These assets amount to €8,084 million at 31 December 2012 (€7,132 million at 31 December 2011) and cover retirement gratuities (with a target of 100% coverage) and specific benefits of the special pension system.

They consist of insurance contracts.

Investments under these contracts break down as follows:

	31/12/2012	31/12/2011
<i>(in millions of Euros)</i>		
<b>Assets funding special pension benefits</b>	<b>7,668</b>	<b>6,762</b>
(%)		
Equities	29.5%	25.7%
Bonds and monetary instruments	70.5%	74.3%
<b>Assets funding retirement gratuities</b>	<b>403</b>	<b>357</b>
(%)		
Equities	31.0%	39.4%
Bonds and monetary instruments	69.0%	60.6%
<b>Assets funding other benefits</b>	<b>13</b>	<b>13</b>
<b>TOTAL</b>	<b>8,084</b>	<b>7,132</b>

## 31.4 Actuarial assumptions

The main actuarial assumptions used for provisions for post-employment benefits and long-term employee benefits under the IEG system are summarised below:

- the discount rate is 3.5% at 31 December 2012 (5% at 31 December 2011);
- the average residual period of employment is 16.1 years;
- the staff turnover rate is considered non-significant;
- the "tarif agent" (special energy price for EDF employees) at 1 January 2012 includes changes in taxes based on that tariff;
- the expected return on fund assets covering specific benefits under the special pension system is 3.83%;

- the expected return on fund assets covering retirement gratuities is 3.34%.

The discount rate for long-term obligations to employees is determined based on the return on a government bond of comparable duration – the French Treasury bond OAT 2035, which has a term of 14 years consistent with the term of employee benefit obligations – plus a spread calculated on bonds issued by the leading non financial companies, also over a comparable duration.

EDF revised its discount rate to 3.5% for 2012 as a result of this method.

## ➤ Note 32. Provisions for other expenses

	31/12/2011	Increases	Decreases		Other	31/12/2012
			Utilisations	Reversals		
<i>(in millions of Euros)</i>						
<b>Provisions for</b>						
■ Personnel expenses	93	82	(58)	(13)	-	104
■ Repairs and maintenance <sup>(1)</sup>	239	-	-	-	(239)	-
■ Other expenses <sup>(2)</sup>	305	123	(30)	(12)	-	386
<b>PROVISIONS FOR OTHER EXPENSES</b>	<b>637</b>	<b>205</b>	<b>(88)</b>	<b>(25)</b>	<b>(239)</b>	<b>490</b>

(1) As EDF has opted to treat these items as asset components, the provision for major maintenance was entirely reversed via equity at 1 January 2012.

(2) At 31 December 2012, this mainly includes €145 million to cover expenses related to social security bodies (€132 million in 2011).

## ➤ Note 33. Financial and operating liabilities

(in millions of Euros)	Maturity			Gross value at 31/12/2012	Gross value at 31/12/2011
	< 1 year	1 to 5 years	> 5 years		
Bonds	3,614	8,804	29,169	41,587	36,268
Borrowings from credit institutions	-	-	500	500	450
Other borrowings	5,195	921	-	6,116	3,375
<b>Other financial liabilities</b>					
– Advances on consumption	10	36	19	65	90
– Other	1,213	1	-	1,214	1,178
<b>Financial liabilities (see note 34)</b>	<b>10,032</b>	<b>9,762</b>	<b>29,688</b>	<b>49,482</b>	<b>41,361</b>
<b>Advances and payments received from customers <sup>(1)</sup></b>	<b>5,833</b>	<b>-</b>	<b>-</b>	<b>5,833</b>	<b>5,444</b>
<b>Trade receivables and related accounts</b>					
– Invoices received	2,686	-	-	2,686	2,518
– Invoices to be received	5,201	7	-	5,208	5,275
<b>Tax and social security <sup>(2)</sup></b>	<b>6,626</b>	<b>-</b>	<b>-</b>	<b>6,626</b>	<b>5,575</b>
<b>Debts related to fixed assets and related accounts</b>					
– Invoices received	460	-	-	460	606
– Invoices to be received	1,078	-	-	1,078	775
<b>Other liabilities</b>					
– Credit balances on customer accounts	55	-	-	55	51
– Other credit balances <sup>(3)</sup>	15,892	-	-	15,892	15,706
<b>Operating, investment and other liabilities</b>	<b>31,998</b>	<b>7</b>	<b>-</b>	<b>32,005</b>	<b>30,506</b>
<b>Cash instruments <sup>(4)</sup></b>	<b>1,025</b>	<b>757</b>	<b>588</b>	<b>2,370</b>	<b>1,889</b>
<b>Deferred income <sup>(5)</sup></b>	<b>619</b>	<b>1,179</b>	<b>2,434</b>	<b>4,232</b>	<b>5,185</b>
<b>TOTAL</b>	<b>49,507</b>	<b>11,705</b>	<b>32,710</b>	<b>93,922</b>	<b>84,385</b>

(1) Advances and progress payments received principally include monthly standing order payments by EDF's residential and business customers, amounting to €5,558 million (€5,145 million at 31 December 2011). The increase over 2012 is mainly explained by the growing number of customers that opt to pay their bills this way.

(2) In 2012 this item includes an amount of €747 million for the CSPE income to be collected by EDF on energy supplied but not yet billed (€579 million in 2011).

(3) The balance mainly comprises the amount of cash pooling and cash management agreements with subsidiaries, i.e. €13.6 billion in 2012 (€13.8 billion in 2011).

(4) Essentially unrealised gains on foreign exchange instruments.

(5) Deferred income at 31 December 2012 comprises €2,183 million (€2,818 million at 31 December 2011) of partner advances made under the nuclear plant financing plans and the associated long-term contracts. The change over the year includes EDF's reimbursement of the advance paid by Enel (€613 million) in December 2012 following termination of the two Groups' industrial partnership for the Flamanville EPR. This advance was recorded at the value of €513 million at 31 December 2011.

Deferred income on long-term contracts also includes an advance paid to EDF in 2010 under the agreement with the Exeltium consortium.

## ➤ Note 34. Financial liabilities

(in millions of Euros)	Balance at 31/12/2011	New borrowings	Repayments	Translation adjustments	Other	Balance at 31/12/2012
Bonds in Euros	925	204	216	-	-	913
Bonds in other currencies	8,926	-	453	(203)	-	8,270
Euro-Medium Term notes (EMTN) in Euros	19,332	5,000	-	-	-	24,332
Euro-Medium Term notes (EMTN) in other currencies	7,085	896	-	91	-	8,072
<b>Bonds</b>	<b>36,268</b>	<b>6,100</b>	<b>669</b>	<b>(112)</b>	<b>-</b>	<b>41,587</b>
Long-term loans in Euros	450	50	-	-	-	500
Short-term loans in other currencies	-	1	-	(1)	-	-
<b>Borrowings from credit institutions</b>	<b>450</b>	<b>51</b>	<b>-</b>	<b>(1)</b>	<b>-</b>	<b>500</b>
Negotiable debt instruments (Euro) <sup>(1)</sup>	1,489	131	-	-	-	1,620
Negotiable debt instruments (non-Euro) <sup>(1)</sup>	1,882	2,714	-	(103)	-	4,493
Contractual financial borrowings	4	-	1	-	-	3
<b>Other borrowings</b>	<b>3,375</b>	<b>2,845</b>	<b>1</b>	<b>(103)</b>	<b>-</b>	<b>6,116</b>
<b>Total borrowings</b>	<b>40,093</b>	<b>8,996</b>	<b>670</b>	<b>(216)</b>	<b>-</b>	<b>48,203</b>
<b>Advances on consumption</b>	<b>90</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(25)</b>	<b>65</b>
Miscellaneous advances	118	10	54	-	17	91
Bank overdrafts	87	-	-	-	(53)	34
Deferred bank debits	56	-	-	-	(7)	49
Interest payable	917	-	-	-	123	1,040
<b>Total other financial liabilities</b>	<b>1,178</b>	<b>10</b>	<b>54</b>	<b>-</b>	<b>80</b>	<b>1,214</b>
<b>TOTAL FINANCIAL LIABILITIES</b>	<b>41,361</b>	<b>9,006</b>	<b>724</b>	<b>( 216)</b>	<b>55</b>	<b>49,482</b>

(1) Issues net of repayments.

In 2012, EDF undertook several bond issues totalling €6,100 million for French and international institutional investors.

Details of bond issues in Euros, totalling €204 million, are as follows:

- €196 million at zero rate, maturing in January 2032;
- €8 million at the fixed rate of 4.3%, maturing in February 2027.

Details of EMTN issues, totalling €5,896 million, are as follows:

- €1,000 million at the fixed rate of 4.125%, maturing in January 2027;
- €2,000 million at the fixed rate of 3.875%, maturing in January 2022;
- £250 million (€298 million) designated as a hedging instrument, at the fixed rate of 5.5%, maturing in October 2041;

- £500 million (€598 million) designated as a hedging instrument, at the fixed rate of 5.5%, maturing in March 2037;
- €2,000 million at the fixed rate of 2.75%, maturing in March 2023.

Redemption of bonds totalled €669 million and concerned bonds in Euros, Swiss francs and Japanese yen that reached maturity.

The net increase of €2,741 million in other borrowings mainly resulted from the net change in negotiable debt instruments (commercial paper).

## 34.1 Breakdown of loans by currency, before and after hedging instruments

(in millions of Euros)	Structure of liability in balance sheet				Impact of instruments		Structure of liability after hedging			
	Non-Euro	In Euros	% Non-Euro	% of debt	Non-Euro	In Euros	Non-Euro	In Euros	% Non-Euro	% of debt
<b>I - In Euros</b>		<b>27,368</b>		<b>57</b>		<b>14,109</b>		<b>41,477</b>		<b>87</b>
CHF	2,410	1,996	10	4	(2,410)	(1,996)	-	-	-	-
GBP	6,035	7,395	35	15	(1,550)	(1,899)	4,485	5,496	88	12
JPY	161,100	1,418	7	3	(161,100)	(1,418)	-	-	-	-
USD	13,229	10,026	48	21	(12,294)	(9,310)	935	716	12	1
<b>Total II - In non-Euro</b>		<b>20,835</b>	<b>100</b>	<b>43</b>		<b>(14,624)</b>		<b>6,211</b>	<b>100</b>	<b>13</b>
<b>TOTAL I + II</b>		<b>48,203</b>		<b>100</b>		<b>(515)</b>		<b>47,688</b>		<b>100</b>

The nominal value of hedging instruments included in off balance sheet commitments has no effect on loans in the balance sheet.

## 34.2 Breakdown of loans by type of interest rate before and after hedging instruments

(in millions of Euros)	Structure of liability in balance sheet			Impact of instruments		Structure of liability after hedging		
	Total	% 31/12/2012	% 31/12/2011	Total		Total	% 31/12/2012	% 31/12/2011
Long-term borrowings and EMTN	41,095			(7,277)		33,819		
Short-term borrowings	6,114			(5,617)		497		
<b>Borrowings at fixed rate</b>	<b>47,209</b>	<b>98</b>	<b>97</b>	<b>(12,894)</b>		<b>34,316</b>	<b>72</b>	<b>82</b>
Long-term borrowings and EMTN	994			6,709		7,703		
Short-term borrowings	-			5,670		5,670		
<b>Borrowings at floating rate</b>	<b>994</b>	<b>2</b>	<b>3</b>	<b>12,379</b>		<b>13,373</b>	<b>28</b>	<b>18</b>
<b>TOTAL</b>	<b>48,203</b>	<b>100</b>	<b>100</b>	<b>( 515)</b>		<b>47,688</b>	<b>100</b>	<b>100</b>



## ➤ Note 35. Financial instruments

EDF uses financial instruments to limit the impact of the foreign exchange rate risk on equity and the income statement, and to hedge its interest rate risk.

	31/12/2012		31/12/2011	
	To be received (notional)	To be given (notional)	To be received (notional)	To be given (notional)
<i>(in millions of Euros)</i>				
<b>1 - Interest rate transactions</b>				
<b>Currencies other than the Euro</b>				
Purchases of FRA GBP contracts	-	-	-	-
Purchases of FRA EUR contracts	-	-	-	-
<b>Interest rate swaps - short-term</b>				
EUR	3,039	3,039	3,428	3,428
<b>Interest rate swaps - long-term</b>				
EUR	6,616	6,616	6,113	6,113
USD	246	246	271	271
CHF	390	390	494	494
GBP	2,285	2,285	1,246	1,246
JPY	350	350	469	469
<b>Sub-total</b>	<b>12,926</b>	<b>12,926</b>	<b>12,021</b>	<b>12,021</b>
<b>2 - Exchange rate transactions</b>				
<b>Forward transactions</b>				
EUR	18,988	24,813	16,684	17,428
CAD	535	535	480	480
USD	10,420	5,221	3,199	2,267
GBP	14,871	14,322	13,968	14,283
CHF	20	20	-	-
HUF	471	471	397	362
PLN	975	993	479	390
JPY	-	54	-	100
MXN	577	577	371	371
Other	89	90	6	7
<b>Currency swaps - long-term</b>				
EUR	7,003	23,958	7,417	23,374
JPY	1,418	-	1,770	-
USD	5,533	-	5,642	-
GBP	15,142	6,152	14,689	6,933
CHF	2,662	666	2,603	332
HUF	22	22	26	26
CAD	127	127	-	-
ILS	123	123	-	-
PLN	-	79	-	72
<b>Sub-total</b>	<b>78,976</b>	<b>78,223</b>	<b>67,731</b>	<b>66,425</b>
<b>3 - Securitisation swaps</b>	<b>771</b>	<b>771</b>	<b>1,125</b>	<b>1,125</b>
<b>TOTAL FINANCIAL OFF-BALANCE SHEET COMMITMENTS</b>	<b>92,673</b>	<b>91,920</b>	<b>80,877</b>	<b>79,571</b>

The amounts shown in the above table represent the nominal value of contracts, translated where necessary using year-end exchange rates (regardless of whether they are classified as hedges).

## 35.1 Impacts of financial instrument transactions on net income

<i>(in millions of Euros)</i>	2012	2011
<b>Instruments not classified as hedges</b>		
Realised gains and losses	71	66
Unrealised gains and losses	120	(71)
Interest rate instruments (swap, cap and floor, FRA, option) <sup>(1)</sup>	(35)	(67)
<b>Instruments classified as hedges</b>		
Interest rate instruments (swap, cap and floor, FRA)	193	100
Exchange rate instruments (currency swap)	90	(7)

*(1) Including interest on swaps.*

## 35.2 Fair value of derivative financial instruments

The fair value of currency and interest rate swaps was calculated by discounting future cash flows using year-end market exchange and interest rates, over the remaining term of the contracts (market value includes accrued interest).

The book value of off-balance sheet derivatives includes accrued interest, equalisation payments and premiums paid or received, and translation

adjustments, which are already booked in EDF's accounts. The difference between book value and market value is the unrealised gain or loss.

The fair value of derivative financial instruments reported off-balance sheet at 31 December 2012 as calculated by EDF is as follows:

<i>(in millions of Euros)</i>	Book value	Fair value
<b>Interest rate hedges</b>		
Long-term swaps	95	1,086
<b>Exchange rate hedges</b>		
Forward exchange transactions	(154)	(153)
Long-term currency swaps	921	757
<b>TOTAL</b>	<b>862</b>	<b>1,690</b>

## ➤ Note 36. Off-balance sheet commitments and operations

At 31 December 2012, off-balance sheet commitments related to operations, financing and investments (other than electricity supply commitments and partnership agreements) comprise the following:

(in millions of Euros)	Maturity				31/12/2012	31/12/2011
	< 1 year	1 to 5 years	5 to 10 years	> 10 years		
<b>Off-balance sheet commitments given</b>	<b>11,719</b>	<b>16,463</b>	<b>11,206</b>	<b>12,490</b>	<b>51,878</b>	<b>49,557</b>
Operating commitments						
■ Commitments related to fuel and energy purchases	3,035	9,209	8,972	12,048	33,264	33,938
■ Commitments related to orders for operating items and fixed assets	4,788	4,962	501	103	10,354	9,309
■ Other operating commitments	1,302	2,244	1,565	339	5,450	3,131
Financing commitments	2,594	48	168	-	2,810	3,179
<b>Off-balance sheet commitments received</b>	<b>1,032</b>	<b>9,072</b>	<b>283</b>	<b>297</b>	<b>10,684</b>	<b>11,778</b>
Operating commitments	1,024	1,117	281	297	2,719	1,870
Financing commitments	8	7,955	2	-	7,965	9,908

### 36.1 Off-balance sheet commitments given

#### 36.1.1 Operating commitments

##### 36.1.1.1 Fuel and energy purchase commitments

In the course of its ordinary generation and supply activities, EDF has entered into long-term contracts for purchases of electricity, gas, other

energies and commodities, as well as nuclear fuels, for periods of up to 20 years. In almost all cases, these are reciprocal commitments, and the third parties concerned are under an obligation to supply the quantities specified in the contracts.

At 31 December 2012, fuel and energy purchase commitments mature as follows:

(in millions of Euros)	Maturity				31/12/2012	31/12/2011
	< 1 year	1 to 5 years	5 to 10 years	> 10 years		
Purchases of electricity	613	3,062	3,002	7,010	13,687	17,488
Purchases of nuclear fuel	2,422	6,147	5,970	5,038	19,577	16,450
<b>PURCHASE COMMITMENTS</b>	<b>3,035</b>	<b>9,209</b>	<b>8,972</b>	<b>12,048</b>	<b>33,264</b>	<b>33,938</b>

## Electricity purchases

Electricity purchase commitments mainly concern:

- Island Energy Systems (IES), which undertook to purchase electricity generated from bagasse and coal, and electricity generated by the plants of EDF's Island Electricity Production subsidiaries;
- hedging contracts: these are forward purchases, for which the volumes and prices are set in contracts with EDF Trading.

In addition to the commitments reported above and under article 10 of the Law of 10 February 2000, in mainland France EDF is obliged, at the producer's request and subject to compliance with certain technical features, to purchase the power produced by co-generation plants and renewable energy generation units (wind turbines, small hydropower and photovoltaic plants).

The additional costs generated by this obligation are offset, after validation by the CRE, by the Contribution to the Public Electricity Service (*Contribution au Service Public de l'Électricité* or CSPE). These purchase obligations total 36 TWh for 2012 (33 TWh for 2011), including 10 TWh for co-generation (12 TWh for 2011), 14 TWh for wind power (12 TWh for 2011), 4 TWh for photovoltaic power (2 TWh for 2011) and 3 TWh for hydropower (3 TWh for 2011).

## Nuclear fuel purchases

Commitments for purchases of nuclear fuel arise from supply contracts for the nuclear plants intended to cover EDF's needs for uranium and fluorination, enrichment and fuel assembly production services. The increase in these commitments mainly results from the signature of new contracts and amendments in 2012, amounting to €4.8 billion.

## Gas and other energy purchases

EDF has entered into gas supply contracts in connection with growth in its gas supply business. Gas purchases for supply and delivery are mostly undertaken through long-term contracts.

In 2011, EDF signed a capacity subscription contract for the Dunkirk methane terminal, which is due to be commissioned in 2015.

### 36.1.1.2 Commitments related to orders for operating items and fixed assets

These are commitments undertaken upon signature of orders for fixed assets, operating items, or orders currently in progress.

## 36.1.2 Financing commitments

These are commitments by EDF to subsidiaries, primarily €1.7 billion to EDF Trading.

## 36.2 Off-balance sheet commitments received

### 36.2.1 Operating commitments

These commitments mainly comprise:

- contracts for sales of services to foreign subsidiaries, totalling €856 million;
- guarantees received in connection with sales under the ARENH system. Electricity supplied by EDF to operators under the NOME law is covered by a stand-alone guarantee enforceable on demand. This guarantee amounts to 1.5 times the average monthly volume of electricity as stated

in the CRE's notification of the annual volume of electricity to be sold, valued at the ARENH price in force.

### 36.2.2 Financing commitments

These commitments correspond to the value of credit lines available to EDF from various banks.

## 36.3 Other types of commitments

### 36.3.1 Electricity supply commitments

In the course of its business, EDF has signed long-term contracts to supply electricity as follows:

- long-term contracts with a number of European electricity operators, for a specific plant or for a defined group of plants in the French nuclear generation fleet, corresponding to installed power capacity of 3.5 GW. 26.2 TWh were supplied under these contracts in 2012;
- in execution of France's NOME law on organisation of the French electricity market, EDF has a commitment to sell some of the energy generated by its "traditional" nuclear power plants to other suppliers. This covers volumes of up to 100 TWh each year until 31 December 2025 (66.4 TWh for 2013);
- EDF is still committed to supplying the residual volumes of 12 TWh by March 2015, in application of the rights acquired at VPP or Virtual Power Plant capacity auctions, which ended in 2011.

In France, a ruling by the French competition authorities (*Conseil de la concurrence*) on 10 December 2007 required EDF to tender a significant capacity of electricity (1,500 MW, i.e. approximately 10 TWh per year for 15 years) to alternative energy suppliers at prices enabling them to compete effectively with EDF's offers on the deregulated mass market. All

of these contracts have been terminated by the subscribing counterparties, and EDF no longer has any related electricity supply commitments at 31 December 2012.

### 36.3.2 Other operating commitments

These are mostly commitments by EDF as lessee under irrevocable operating lease contracts for premises, equipment and vehicles used in the course of its business. The corresponding rents are subject to renegotiation at intervals defined in the contracts.

### 36.3.3 Investment commitments

Agreement with Veolia Environnement: Veolia Environnement has granted EDF a call option on all its Dalkia shares in the event that a competitor of EDF takes control over Veolia Environnement. EDF has also granted Veolia Environnement a call option over all its Dalkia shares in the event that the status of EDF should change and a competitor of Veolia Environnement, individually or with other parties, should take control over EDF. If the parties fail to agree on the sale price of the shares, it is to be fixed by an independent expert.

## ➤ Note 37. Environment

### 37.1 Greenhouse gas emission rights

In application of the Kyoto protocol, the EU Directive aiming to reduce greenhouse gas emission levels by attributing emission rights came into effect in 2005, for an initial three-year period which ended on 31 December 2007 and was marked by a reduction in the volumes of rights allocated.

The second allocation period ran from 2008 to 2012.

In 2012, EDF surrendered 14 million tonnes in respect of emissions generated in 2011. In 2011, EDF surrendered 19 million tonnes in respect of emissions generated in 2010.

EDF's total emission rights allocation for 2012 recorded in the national registers is 22 million tonnes (17 million tonnes for 2011). The volume of emissions at 31 December 2012 stood at 16 million tonnes (14 million tonnes at 31 December 2011).

As part of the Clean Development Mechanism defined in the Kyoto protocol, the EDF group set up a Carbon Fund in late 2006 with the aim of supporting projects to reduce greenhouse gas emissions in emerging countries and benefiting from carbon emission permits. This fund involves EDF and all the European entities, and is managed by EDF Trading. The carbon fund has no significant impact on EDF's financial statements at 31 December 2012.

### 37.2 Energy savings certificates

The French Law of 13 July 2005 introduced a system of energy savings certificates. Companies selling electricity, gas, heat or cold to end-users with sales above a certain level are subject to energy savings obligations for a three-year period. They fulfil these obligations by making direct or indirect energy savings rewarded by certificates, or by purchasing energy savings certificates. At the end of the three years, the entities concerned must provide evidence of compliance with obligations by surrendering the certificates, or pay a fine to the Treasury.

The energy savings obligations required of EDF for the three-year period 1 July 2006 to 30 June 2009 amounted to 29,849 GWh in final energy cumulated and discounted ("cumac"). EDF complied with this obligation.

In the second period, which began on 1 January 2011 and runs until 31 December 2013, the system was extended to new obligated actors (fuel distributors) and applies stricter requirements for obtaining energy savings certificates. EDF is well-placed to meet its obligation thanks to energy-efficient offers for each market segment: residential customers, business customers, local authorities and organisations funding social projects.

EDF's obligation will be calculated retrospectively, based on gas and electricity sales to households and service sector businesses for the period 2010-2012. The volumes of certificates obtained between the two periods will count towards achievement of the obligation for the second period.

## ➤ Note 38. Chairman and CEO and directors' remuneration

The Company's key management and governance personnel are the Chairman and CEO and the directors. In application of law 83-675 of 26 July 1983 on democratisation of the public sector, directors representing the government and employee representative directors receive no fees for their services as directors.

The total gross compensation paid by EDF (salaries, all types of benefits and director's fees, excluding employer contributions) to the Company's key management personnel is as follows:

(in Euros)	2012	2011
Chairman and CEO	1,593,007 <sup>(1)</sup>	1,560,528
Directors' fees	200,000	147,000

(1) Including the performance-related salary for 2011, paid in 2012.

Decree 2012-915 of 26 July 2012 set an annual limit of €450,000 for the remuneration paid to the Chairman and CEO. In December 2012, the Minister for the Economy required EDF to apply this decree with retroactive effect from 1 October 2012.



## ➤ Note 39. Subsequent events

### 39.1 Bond issue with unlimited maturity

On 22 January 2013 EDF launched several tranches of a bond in Euros and sterling with unlimited maturity:

- €1.25 billion at 4.25% coupon for the tranche with a 7-year first call date;
- €1.25 billion at 5.375% coupon for the tranche with a 12-year first call date;
- £1.25 billion at 6% coupon for the tranche with a 13-year first call date.

On 24 January 2013 EDF also launched a US\$3 billion bond with unlimited maturity at 5.25% coupon and a 10-year first call date.

These instruments are subordinated to all senior debt, which explains why their coupon is higher than senior bonds. They will be included in equity in EDF's 2013 financial statements from reception of the funds (29 January 2013).

This is the first time EDF has issued this type of instrument, which it considers a tool for balance sheet optimisation in view of the useful lives of its assets and the long-term investment cycle of its industrial projects.

### 39.2 Allocation of the CSPE receivable to dedicated assets for secure financing of long-term nuclear expenses

In application of the decree of 23 February 2007, on 8 February 2013 the French government authorised allocation of CSPE receivable held by EDF to the dedicated assets for secure financing of long-term nuclear expenses.

In view of this authorisation, the positive opinion of the Nuclear Commitments Monitoring Committee and the deliberations of the Board of Directors at its meeting of 13 February 2013, EDF has decided to allocate the total receivable, which represents the accumulated shortfall in CSPE compensation at 31 December 2012 and amounts to €4.9 billion, to dedicated assets. This allocation is concurrent with withdrawals of €2.4 billion of assets from the portfolio (diversified bonds and equity investments, see note 19), such that the net allocation to dedicated assets is €2.5 billion. The objective of reaching 100% coverage of long-term nuclear provisions in advance of the legal June 2016 deadline (set by the "NOME" law) is thus achieved.

The disposal of these financial assets will result in an equivalent reduction in the EDF Group's net indebtedness.

## Statutory Auditors' Report on the financial statements

*This is a free translation into English of the Statutory Auditors' Report issued in French and is provided solely for the convenience of English speaking users. The Statutory Auditors' Report includes information specifically required by French law in such reports, whether modified or not. This information is presented below the audit opinion on the financial statements and includes an explanatory paragraph discussing the auditors' assessments of certain significant accounting and auditing matters. These assessments were considered for the purpose of issuing an audit opinion on the financial statements taken as a whole and not to provide separate assurance on individual account captions or on information taken outside of the financial statements.*

*This report also includes information relating to the specific verification of information given in the Group management report and in the documents addressed to shareholders.*

*This report should be read in conjunction with, and construed in accordance with, French law and professional auditing standards applicable in France.*

### Year ended 31 December 2012

To the Shareholders,

In compliance with the assignment entrusted to us by your Annual General Meeting, we hereby report to you, for the year ended 31 December 2012, on:

- the audit of the accompanying financial statements of Électricité de France S.A. ("the Company");
- the justification of our assessments;
- the specific procedures and disclosures required by law.

These financial statements have been approved by the Board of Directors. Our role is to express an opinion on these financial statements based on our audit.

### 1. Opinion on the financial statements

We conducted our audit in accordance with professional standards applicable in France; those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit involves performing procedures, using sampling techniques or other methods of selection, to obtain audit evidence about the amounts and disclosures in the financial statements. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made, as well as the overall presentation of the financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

In our opinion, the financial statements give a true and fair view of the assets and liabilities and of the financial position of the Company as at 31 December 2012 and of the results of its operations for the year then ended in accordance with French accounting principles.

Without qualifying our opinion, we draw your attention to the valuation of long-term provisions relating to nuclear electricity production, as described in notes 1.14 and 30 to the financial statements, which results as indicated in note 1.2 from management best estimates. This valuation is sensitive to the assumptions made concerning technical processes, costs, inflation rates, long-term discount rates, and forecast cash outflows. Changes in these parameters could lead to a material revision of the level of provisioning.

### 2. Justification of our assessments

The preparation of the financial statements requires the use of accounting estimates, which have been made in an uncertain environment, due to the crisis of public finances affecting certain countries of the Euro zone. This crisis is coupled with an economic and liquidity crisis as well as uncertainties related to commodities and power prices, thus resulting in difficulties to determine the economic outlook. In this context, in accordance with the requirements of article L.823-9 of the French Commercial Code ("Code de commerce"), we have made our own assessments which are brought to your attention, in relation to the following matters:

#### Accounting principles and policies

Notes 1.3, 1.7 and 1.15 to the financial statements describe the principles and policies used for the accounting and valuation of revenues related to energy delivered but not yet measured nor billed, the valuation of financial investments and the determination of provisions for employee benefits.

As part of our assessment of the Company's accounting principles and methods, we have verified the appropriateness of the accounting methods used by the Company and the information disclosed in the notes to the financial statements, as well as the accuracy of the implementation of these accounting methods.

#### Accounting estimates

The Company describes in the notes to the financial statements the information related to:

- the main management judgment and estimates (note 1.2);
- the methods used to account for the shortfall in the compensation for the Contribution to the Electricity Public Service Costs ("Contribution au Service Public de l'Électricité") as at 31 December 2012, in view of the agreement reached in January 2013 (notes 3.1, 5 and 23);
- the underlying assumptions on which the valuation of provisions for risks and contingent liabilities are based (notes 1.14 and 29);
- the valuation of provisions for employee benefits (notes 1.15 and 31).

Our procedures consisted in assessing these estimates, the data and assumptions, and as applicable, the legal opinions on which they are based, reviewing, on a test basis, the technical data and calculations performed by the Company, comparing accounting estimates of prior periods with corresponding actual amounts, reviewing the procedures for approving these estimates by management and finally verifying that the notes to the financial statements provide appropriate disclosures.



## Verification procedures

The procedures we performed in relation to the regulatory framework related to the principle of regulated access to historical nuclear energy ("*Accès Régulé à l'Énergie Nucléaire Historique*" or "*ARENH*") as established by the NOME Law in France, effective 1 July 2011, are based on the information available from the Company, or released by the Regulatory Energy Commission ("*Commission de Régulation de l'Énergie*"), and the findings resulting from agreed-upon procedures performed by independent third parties that had access to the underlying transactions.

These assessments were made as part of our audit of the financial statements, taken as a whole, and therefore contributed to the opinion we formed which is expressed in the first part of this report.

## 3. Specific procedures and disclosures

We have also performed, in accordance with professional standards applicable in France, the specific verifications required by French law.

We have no matters to report as to the fair presentation and the consistency with the financial statements of the information given in the management report of the Board of Directors, and in the documents addressed to shareholders with respect to the financial position and the financial statements.

Concerning the information given in accordance with the requirements of article L.225-102-1 of the French Commercial Code relating to remunerations and benefits received by the directors and any other commitments made in their favour, we have verified its consistency with the financial statements or with the underlying information used to prepare these financial statements and, where applicable, with the information obtained by your Company from companies controlling your Company or controlled by it. Based on this work, we attest the accuracy and fair presentation of this information.

In accordance with French law, we have verified that the required information concerning the purchase of investments and controlling interests and the identity of the shareholders and holders of the voting rights has been properly disclosed in the management report.

Paris La Défense and Neuilly-sur-Seine, 13 February 2013

### The Statutory Auditors

KPMG Audit  
Department of KPMG S.A.

Deloitte & Associés

Bernard Cattenoz

Jacques-François Lethu

Alain Pons

Patrick E. Suissa

# E

## Summary of environmental and social indicators and reporting methodology for 2012 environmental and social data

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## Summary of environmental and social indicators

### Economic indicators

	Unit	Scope <sup>(3)</sup>						GRI Ref. <sup>(2)</sup>
		2012	2011	2010 <sup>(1)</sup>	2012	2011	2010	
Provisions for decommissioning and last cores	in million €	20,979	19,843	19,684	2	2	2	
Provisions for nuclear fuel cycle end-cycle	in million €	19,525	18,830	18,020	2	2	2	
Compensation paid or to be paid following legal decisions on environmental matters	in thousand €	6.9	0	8	1	1	1	

(1) Data excluding EnBW, except for economic indicators.

(2) GRI: Global Reporting Initiative.

(3) Scope 1: EDF

Scope 2: EDF Group



## Environmental indicators

		Scope <sup>(5)</sup>						
	Unit	2012	2011	2010 <sup>(1)</sup>	2012	2011	2010	GRI Ref. <sup>(2)</sup>
Fuels & raw materials - Fuel consumption								
Nuclear fuel loaded in the reactor	t	1,096	1,205	1,138	1	1	1	EN 1
Coal *	kt	24,277	21,024	20,211	2	2	2	EN 1
Heavy fuel oil	kt	1,098	1,170	1,625	2	2	2	EN 1
Domestic fuel oil	kt	317	402	448	2	2	2	EN 1
Natural gas	10 <sup>6</sup> m <sup>3</sup>	9,290	6,859	8,072	2	2	2	EN 1
Industrial gas	10 <sup>6</sup> m <sup>3</sup>	842	3,555	3,707	2	2	2	EN 1
Water - raw materials consumed from sources outside of the company								
Cooling water withdrawn *	10 <sup>9</sup> m <sup>3</sup>	54.8	55.2	53.9	2	2	2	EN 8
<i>o/w the fresh water portion *</i>	10 <sup>9</sup> m <sup>3</sup>	28.0	26.8	n.c.	2	2	n.c.	EN 8
Cooling water returned *	10 <sup>9</sup> m <sup>3</sup>	54.2	54.6	53.3	2	2	2	EN 21
<i>o/w the fresh water portion *</i>	10 <sup>9</sup> m <sup>3</sup>	27.5	26.3	n.c.	2	2	n.c.	EN 21
Air - gas emissions								
Total CO <sub>2</sub> emissions (including facilities not subject to quotas) **	Mt	79.8	70.5	75.7	2	2	2	EN 16
SO <sub>2</sub> emissions *	kt	137.8	140.6	187.9	2	2	2	EN 20
NO <sub>x</sub> emissions	kt	182.2	157.0	167.6	2	2	2	EN 20
Dust	t	6,968	5,407	7,929	2	2	2	EN 20
CH <sub>4</sub> emissions	kt eq. CO <sub>2</sub>	40.5	32.2	41.6	2	2	2	EN 16
N <sub>2</sub> O emissions	kt eq. CO <sub>2</sub>	329.8	254.7	287.9	2	2	2	EN 16
SF <sub>6</sub> emissions – EDF *	kt eq. CO <sub>2</sub>	83.8	94.3	98.3	1	1	1	EN 16
SF <sub>6</sub> emissions – EDF + ERDF *	kt eq. CO <sub>2</sub>	93.3	102.8	n.c.	1b	1b	n.c.	EN 16
SF <sub>6</sub> emissions – Group *	kt eq. CO <sub>2</sub>	109.8	n.c.	n.c.	2	n.c.	n.c.	EN 16
Conventional waste								
Hazardous waste * <sup>(3)</sup>	t	64,598	60,956	40,679	2	2	1	EN 22
Non-hazardous waste * <sup>(3)</sup>	t	321,789	302,251	198,422	2	2	1	EN 22
Conventional industrial waste recycled or discharged for recycling * <sup>(3)</sup>	t	253,412	251,908	190,353	2	2	1	EN 22
Ash produced	kt	3,816	3,617	3,581	2	2	2	EN 22
Energy								
Renewable energy: quantity of electricity and heat produced through renewable energy (excluding hydroelectric power) *	GWh	15,583	11,032	10,385	2	2	2	EN 6
Direct energy consumption, broken down by primary source								
Internal consumption, electricity generated from pumping stations	TWh	6.7	6.9	6.6	1	1	1	EN 3
Internal consumption, electricity	TWh	22.4	22.8	22.6	1	1	1	EN 3
Management								
Expenses related to environmental protection	in million €	3,465	2,800	2,579	1	1	1	EN 30
of which provisions	in million €	2,465	1,765	1,712	1	1	1	EN 30
Environmental management (% of consolidated Group's sales covered by an ISO 14001 certification)	%	98 <sup>(4)</sup>	79	n.c.	2	2		n.c.

\* 2012 data was verified with limited assurance by the Statutory Auditors.

\*\* 2012 data was verified with reasonable assurance by the Statutory Auditors.

n.c. : not communicated.

(1) Data excluding EnBW, except for economic indicators.

(2) GRI: Global Reporting Initiative.

(3) Extended to Group scope in 2011.

(4) Including the companies not integrated into the Group certificate.

(5) Scope 1: EDF. Scope 1b: EDF + ERDF. Scope 2: EDF Group

## Nuclear indicators – EDF

	Unit	2012	2011	2010	GRI Ref.
<b>Emissions in water</b>					
Tritium	TBq/reac.	20.47	18.07	19.1	EN 21
Carbon-14	GBq/reac.	13.19	13.06	12.6	EN 21
<b>Emissions in air</b>					
Carbon-14	TBq/reac.	0.176	0.174	0.170	EN 20
Tritium	TBq/reac.	0.64	0.65	0.55	EN 20
<b>Nuclear waste</b>					
Solid, low and intermediate-level short-lived radioactive waste *	m <sup>3</sup> /TWh	20.7	15.6	12.4	EN 24
Solid high and intermediate-level long-lived radioactive waste *	m <sup>3</sup> /TWh	0.88	0.87	0.88	EN 24
Evacuated spent nuclear fuel	t	1,075	1,199	1,140	EN 24

\* 2012 data was verified with limited assurance by the Statutory Auditors.

## Nuclear Indicators – EDF Energy

	Unit	2012	2011	2010	GRI Ref.
<b>Emissions in water</b>					
Tritium - AGR Reactor (Advanced Gas-cooled Reactor)	TBq/reac.	135.7	124.5	107.8	EN 21
Tritium - PWR Reactor (Pressurised Water Reactor)	TBq/reac.	44	46	25	EN 21
<b>Emissions in air</b>					
Carbon 14 - AGR reactor	TBq/reac.	0.7	0.68	0.61	EN 20
Carbon 14 - PWR reactor	TBq/reac.	0.3	0.3	0.13	EN 20
Tritium - AGR reactor	TBq/reac.	0.68	0.8	0.92	EN 20
Tritium - PWR reactor	TBq/reac.	0.8	0.7	0.74	EN 20
<b>Nuclear waste</b>					
Evacuated uranium *	t	216	210.7	131	EN 24
Evacuated low-level radioactive waste *	m <sup>3</sup>	698	608	498	EN 24
Medium-level radioactive waste generated *	m <sup>3</sup>	161	161	162	EN 24

\* 2012 data was verified with limited assurance by the Statutory Auditors.

## Nuclear indicators – Constellation Energy Nuclear Group

	Unit	2012	2011	2010	GRI Ref.
<b>Emissions in water</b>					
Tritium	TBq/reac.	12.91	12	11.11	EN 21
<b>Emissions in air</b>					
Carbon-14	TBq/reac.	0.33	0.34	0.69	EN 20
Tritium	TBq/reac.	1.38	1.40	1.41	EN 20
<b>Fuels<sup>(1)</sup></b>					
Delivered nuclear fuel*	t	46	48	34	EN 24
<b>Nuclear waste<sup>(1)</sup></b>					
Evacuated solid, low and intermediate-level radioactive waste *	m <sup>3</sup>	2,419	1,287	735	EN 24

\* 2012 data was verified with limited assurance by the Statutory Auditors.

(1) Data consolidated based on the percentage of subsidiary's participation.

## Social Indicators

EDF Group	Unit	2012 <sup>(3)</sup>	2011 <sup>(4)</sup>	2010 <sup>(4)</sup>	GRI Ref.
<b>Employees as of 31/12/2012 and breakdown <sup>(1)</sup></b>					
EDF + ERDF	Number	107,333	103,954	96,571	LA 1
TOTAL EDF group **	Number	159,740	156,168	158,842	LA 1
<b>Breakdown of employees by age</b>					
Employees less than 25 years old **	%	8%			
Employees 25 to 35 years old **	%	23%			
Employees 36 to 45 years old **	%	25%			
Employees 46 to 55 years old **	%	34%			
Employees 56 years old and older **	%	10%			
<b>Breakdown of employees by geographical area (according to the registered office)</b>					
France	Number	129,328			
of which Dalkia	Number	15,964			
Great Britain	Number	16,178			
Italy	Number	5,210			
Other European countries	Number	7,503			
Other International	Number	1,521			
Number of managers *	Number	40,355	37,786	39,231	LA 1
Percentage of women at managerial level *	%	25.0%	23.9%	22.7%	LA 13
Number of non-managers *	Number	119,385	118,382	119,611	LA 13
<b>Professional equality</b>					
Men employees **	Number	118,512	117,023	121,009	LA 13
Women employees **	Number	41,228	39,145	37,833	LA 13
Men at managerial level *	Number	30,286	28,753	30,306	LA 13
Women at managerial level *	Number	10,069	9,033	8,925	LA 13
<b>Hirings/departures</b>					
Hirings *	Number	12,577	12,755	13,790	LA 2
Other arrivals * <sup>(1)</sup>	Number	7,499	5,849	3,105	LA 2
Retirement/inactivity departures *	Number	4,185	4,200	4,708	LA 2
Resignations * <sup>(2)</sup>	Number	2,355	2,761	2,929	LA 2
Lay-offs, dismissals, employees made inactive *	Number	1,739	1,689	1,924	LA 2
Other departures * <sup>(1)</sup>	Number	9,304	9,398	10,457	LA 2
<b>Compensation</b>					
Total gross compensation	Millions of euros	See RG note 10.1			
Part-time employees *	Number	14,690	15,296	17,719	LA 1
<b>Absenteeism</b>					
Average number of days absent (illness + accident)	Number	9.0			
<b>Health and safety conditions</b>					
Fatal injuries *	Number	14	13	15	LA 7
Injury frequency rate *		3.8	3.9	4.5	LA 7
Work accidents (involving one day or more out of work *)	Number	921	933	1,145	LA 7
Degree of seriousness		0.16			

\* 2012 data was verified with limited assurance by the Statutory Auditors.

\*\* 2012 data was verified with reasonable assurance by the Statutory Auditors.

(1) The entries and exits from the scope are counted respectively in: "Other arrivals" and "Other departures".

(2) Individual contract terminations (including apprentices) are counted in "Other departures" regardless of what happens after the contract terminates. Departures during the probationary period are counted in "Other departures".

(3) Excluding RTE in the new definition – employees in individual contracts from various social measures, doctors and personnel made available to external organisations (AMADOE).

(4) Including RTE.

	Unit	2012 <sup>(4)</sup>	2011 <sup>(5)</sup>	2010 <sup>(5)</sup>	GRI Ref.
<b>Professional relations</b>					
Percentage of employees covered by collective bargaining agreements <sup>(1)</sup>	%	88%	87%	94%	LA 4
<b>Training</b>					
Total number of training hours	Number	7,631,618			
Number of employees having received training * <sup>(2)</sup>	Number	131,311	118,930	127,332	LA 10
<b>Employment and integration of disabled workers</b>					
Number of employees with disabilities <sup>(3)</sup>	Number	4,519	4,601	3,078	LA 13

(1) Excluding Dalkia International in 2010.

(2) In 2010 and 2011, excluding ESTAG.

(3) This data is declarative at EDF Energy.

In 2012, as in 2010 and 2011, CENG did not communicate this information for confidentiality reasons.

In 2011 and 2010, the value collected by Edison does not take into account their subsidiary Abu Qir, which was integrated during the year 2009.

(4) Excluding RTE in the new definition – employees in individual contracts from various social measures, doctors and personnel made available to external organisations (AMADOE).

(5) Including RTE.

EDF	Unit	2012	2011	GRI Ref.
<b>Workforce on 31/12/2012 &amp; breakdown</b>				
Statutory employees (on 31/12)	Number	64,838	63,002	LA 1
Non statutory employees - unlimited term contract	Number	433	409	LA 1
Non statutory employees - Fixed term contract	Number	3,851	3,773	LA 1
Total non statutory employees	Number	4,284	4,182	LA 1
Total workforce **	Number	69,122	67,184	LA 1
Number of managers *	Number	28,230	26,644	LA 1
Percentage of women at managerial level *	%	26.0%	25.1%	LA 13
Number of non-managers *	Number	40,892	40,540	LA 13
Technicians and supervisors	Number	33,084	32,871	LA 13
Enforcement agents	Number	7,808	7,669	LA 13
<b>Equality in the workplace</b>				
Male workforce **	Number	47,852	46,938	LA 13
Female workforce **	Number	21,270	20,246	LA 13
Male at managerial level *	Number	20,884	19,944	LA 13
Female at managerial level *	Number	7,346	6,700	LA 13
<b>Hires / departures</b>				
Hires *	Number	4,452	4,021	LA 2
Integration & reinstatement *	Number	261	251	LA 2
Other arrivals * <sup>(1)</sup>	Number	3,194	2,818	LA 2
Retirement/inactivity departures *	Number	2,061	1,990	LA 2
Resignations *	Number	114	123	LA 2
Layoffs, dismissals, employees made inactive *	Number	6	14	LA 2
Death *	Number	82	89	LA 2
Other departures * <sup>(6)</sup>	Number	3,709	3,285	LA 2
<b>Overtime</b>				
Number of overtime hours	In thousands	2,831	2,791	

(1) The arrivals and departures under seasonal fixed term contracts are not included.

\* 2012 data having been subject to verification with limited assurance by the Statutory Auditors.

\*\* 2012 data having been subject to verification with reasonable assurance by the Statutory Auditors.

EDF	Unit	2012	2011	GRI Ref.
<b>Outside manpower</b>				
Average number of monthly temporary employees	Number	1,837	1,187	LA 1
<b>Organization of working time</b>				
Full-time employees	Number	60,612	58,157	LA 1
Part-time employees *	Number	8,510	9,027	LA 1
Employees on continuous service	Number	6,882	6,808	LA 1
<b>Absenteeism</b>				
Absenteeism *	%	3.8%	3.9%	LA 7
Maternity & family leave hours / actual work time	%	0.7%	0.7%	LA 7
<b>Health and safety conditions</b>				
Number of occupational diseases declared to Social Security during the year		13	11	
Fatal accidents	Number	6	8	LA 7
Frequency rate *		3.4	3.7	LA 7
Degree of seriousness *		0.15	0.14	LA 7
Work accidents (with stoppage of one day or more)	Number	333	358	LA 7
<b>Compensation - personnel charges - profit-sharing</b>				
Main monthly compensation				
Managers	Euros	4,308	4,248	EC 1
Technicians and supervisors	Euros	2,612	2,581	EC 1
Enforcement agents	Euros	1,877	1,874	EC 1
Personnel expenses	Millions of euros	6,113	5,784	EC 1
Average amount of profit-sharing per employee	Euros	1,820	1,583	EC 1
<b>Social relations</b>				
Number of collective bargaining agreements signed (France)	Number	8	11	HR 5
Percentage of employees covered by collective bargaining agreements <sup>(1)</sup>	%	94%	94%	LA 4
<b>Training</b>				
Number of employees having received a training course *	Number	58,899	55,905	LA 10
<b>Employment and insertion of workers with disabilities</b>				
Number of employees with disabilities *	Number	1 842	1,698	LA 13
Number of workers with disabilities recruited	Number	124	94	LA 13
<b>Company welfare facilities</b>				
Committees' Budget (amount accounted as 1 %)	Millions of euros	196	198	

(1) EDF SA's employees are not covered by a collective bargaining agreement within the meaning of the law, but the status of the Electricity and Gas Industries.

\* 2012 data having been subject to verification with moderate assurance by the Statutory Auditors.

## Statutory Auditors' assurance report on a selection of social and environmental indicators published in the 2012 Reference Document, the 2012 Sustainable Development Indicators Report, and the Group's 2012 Business and Sustainable Development Report

*This is a free translation into English of the statutory auditors' report issued in French prepared in accordance with Article L.225-235 of French Commercial Code is provided solely for the convenience of English speaking users.*

*This report should be read in conjunction and construed in accordance with French law and the relevant professional standards applicable in France.*

Financial year closed 31 December 2012

To General Management,

As requested, and in our capacity as Statutory Auditors of EDF SA ("the Company"), we are presenting our report on of limited and reasonable level of assurance on a selection of social and environmental information identified by the signs (\*) and (\*\*) in the tables in the "Summary of environmental and Social Indicators" section of the 2012 Reference Document, the 2012 Sustainable Development Indicators Booklet, and the 2012 Activity and Sustainable Development Report.

### Company's Responsibility

This selection of indicators ("the Data") was prepared under the responsibility of the Sustainable Development Department in conjunction with the Group Human Resources Department in accordance with the internal measurement

and reporting protocol (hereafter "the Protocol"), which is available upon request to the Sustainable Development and HR Control Departments at the Company's headquarters, and summarized in the 'Reporting methodology for 2012 environmental and social data' paragraph of the 2012 Reference Document, the 2012 Sustainable Development Indicators Booklet, and the 2012 Activity and Sustainable Development Report.

### Independence and quality control

Our independence is defined by the rules and regulations, the deontological code of the profession and the provisions of Article L. 822-11 of the French Commercial Code. In addition, we implemented a comprehensive system of quality control including documented policies and procedures aiming at ensuring the compliance with the deontological rules, professional standards and applicable rules and regulations.

## The Responsibility of the Statutory Auditors

It is our responsibility, on the basis on our work:

- to provide reasonable assurance on whether the information selected by the Group, as referred to in the table below, and identified by the sign (\*\*) is fairly presented, in all material respects, in accordance with the Protocol.

Scope	Social indicators
EDF Group	Total workforce at the end of the period apportioned by gender and age

Scope	Environmental indicators
EDF Group	CO <sub>2</sub> emissions (for electricity and heat production)



- to provide limited assurance on whether the information selected by the Group, as referred to in the table below, and identified by the sign (\*\*) is fairly presented, in all material respects, in accordance with the Protocol.

Scope	Social indicators
EDF Group	Number of managers and non-managers
	Percentage of women at managerial level
	External hires
	Other arrivals
	Retirement/inactivity departures
	Resignations
	Lay-offs, dismissals, employees made inactive
	Other departures
	Number of part-time employees
	Fatal accidents (employees)
	Work accidents (involving one day or more out of work)
	Injury frequency rate
	Number of employees having received a training course
EDF SA	Absenteeism
	Number of employees with disabilities
	Degree of seriousness

Scope	Environmental indicators
EDF Group	Quantity of electricity and heat produced through renewable energy (excluding hydroelectric power)
	SO <sub>2</sub> emissions (for electricity and heat production)
	Cooling water drawn, including freshwater
	Cooling water returned, including freshwater
	Coal consumption
	Hazardous waste
	Non-hazardous waste
	Conventional industrial waste recycled or discharged for recycling
	SF <sub>6</sub> emissions
EDF SA	Solid-low and intermediate-level short-lived radioactive waste
	Solid-high and intermediate-level long-lived radioactive waste
	Very low activity radioactive waste from decommissioning
EDF Energy	Evacuated uranium
	Evacuated low-level radioactive waste
	Intermediate-level radioactive waste generated
Constellation Energy Nuclear Group (CENG)	Delivered nuclear fuel
	Low- and intermediate-level activity radioactive waste removed

## Nature and scope of work

We conducted our engagement in accordance with the ISAE 3000 standard (International Standard on Assurance Engagements) and with the professional guidelines applicable in France.

We performed the following procedures in order to obtain:

- a reasonable assurance that the data selected by the Group and identified by the sign (\*\*) do not contain any significant anomalies which cast doubt on their conformity, in all their significant aspects, with the Protocol;

- a limited assurance that the data selected by the Group and identified by the sign (\*) do not contain any significant anomalies which casts doubt on their conformity, in all their significant aspects, with the Protocol; a higher level of assurance would have required more extensive work.

We referred to our experts in societal responsibility to assist us with the following work:

- we performed the following works:
  - we assessed the suitability of the protocol regarding its relevance, completeness, neutrality, understandability and reliability, by taking into consideration, if necessary, the best practices in the sector,

- we examined the internal control and risk management procedures related to the preparation of the selected Data,
- we verified the implementation in the group of a collection, consolidation, handling and control process aiming at the completeness and the consistency of the selected data,
- we interviewed the people responsible for the social and environmental and social reporting and conducted tests of detail on a sample-basis to verify that the protocol was correctly applied in certain entities<sup>1</sup> ("the Entities"),
- we conducted consistency tests on the consolidation of this Data.
- the Entities selected represent with respect to:
  - reasonable assurance: 63% for the indicator "Total workforce end of period apportioned by age and gender" and 50% for the indicator "CO<sub>2</sub> emissions (for electricity and heat production)";
  - moderate assurance: on average 53% of the indicators related to the social data and 42% of the indicators related to the environmental data tested.

## Conclusions

### Reasonable assurance

In our opinion, the Data examined and identified by the sign (\*\*) and presented in the tables of the "Summary of Environmental and Social Indicators" of the EDF Group's 2012 Reference Document, the 2012 Sustainable Development Indicators Booklet, and the 2012 Business and Sustainable Development Report, were prepared, in all material aspects, in accordance with the above-mentioned Protocol stated.

### Limited assurance

Based on our work, we did not identify any material anomalies likely to call into question that the examined Data, identified by the sign (\*) and presented in the tables of the section "Summary of environmental and social indicators" of the EDF group's 2012 Reference Document, the 2012 Sustainable Development Indicators Booklet and the 2012 Activity and Sustainable Development Report.

Paris – la Défense and Neuilly-sur-Seine, 13 February 2013

#### KPMG Audit

Department of KPMG S.A

Jacques-François Lethu

Partner

Jean-Louis Caulier

Partner

#### Deloitte & Associés

Alain Pons

Partner

Patrick E. Suissa

Partner

1. CENG: Calvert Cliffs Nuclear Power Plant (USA), and corporate headquarters of CENG (USA).

EDF Énergies Nouvelles: technical office (France).

EDF Energy: Nuclear power plant of Dungeness B (G-B.), Nuclear power plant of Hunterston B (G-B.), thermal power plant of Westburton (G-B.), HR centre of Crawley (G-B.) and EDF Energy's head office.

EDF Polska: thermal power plant of Rybnik (Poland) et EDF Polska's head office (Poland).

EDF SA: thermal power plant of Cordemais (France), thermal power plant of Bouchain (France), thermal power plant of Le Havre (France), thermal power plant of Blénod (France), nuclear power plant of Gravelines (France), nuclear power plant of Flamanville 1 & 2 (France), nuclear power plant in decommissioning of Brennilis (France), HR agency of Nantes (France), HR agency of Toulouse (France), HR agency of Rouen (France).

Edison: thermal power plant of Marghera Levante (Italy), thermal power plant of Torviscosa (Italy) and Edison's head office (Italy).

ERDF: DR Nord-Pas-de-Calais (France), DR Sillon rhodanien (France), DR Pyrénées-Landes (France), MOE HR agency Sud-Ouest (France), MOE HR agency Est (France), MOE HR agency Manche - mer du Nord (France).

Figlec : thermal power plant (China).

Tiru: incinerator of Saint-Ouen (France).

UTE Norte Fluminense: thermal power plant (Brazil).

## Reporting methodology for 2012 environmental and social data

### Scope of data

The quantitative social and environmental data in this report was collected using the EDF Group's data consolidation software systems.

The social and environmental data are consolidated on the basis of the accounting consolidation and relevant criteria rules in terms of human resources and environmental impact.

Companies which are fully consolidated for accounting purposes are fully consolidated with respect to social and environmental indicators.

Companies which are proportionally consolidated for accounting purposes are proportionally consolidated with respect to social and environmental indicators.

Companies accounted using the equity method are not taken into account in terms of social and environmental indicators.

In addition to these criteria, the Group's consolidation scope for social data only included companies with a large workforce in human resources terms (over 50) for more than six months.

The determination of the criteria adopted for the environmental data was based on the significant industrial activities (production, distribution and transport) with respect to the subsidiaries' environmental impact. Only those entities which have been inside the scope of consolidation for more than one year, and those still in the scope of consolidation on 31 December 2012, were taken into account. As RTE was deconsolidated before the closing date, its data was excluded for the whole of 2011 and 2012.

The method of consolidating the three international subsidiaries changed from a partial consolidation to a global consolidation during 2012 (Zielona Gora, Kogeneracja and Edison).

With regards to Human resource data, two new subsidiaries with over 50 employees were consolidated in 2012 in the EDF Group's reporting scope (EDF Optima Solutions and EDF Paliwa).

The reporting scope for environmental data was extended to Fenice's Polish and Spanish subsidiaries.

### Details on environmental data

The environmental data in this document were prepared using descriptive and methodological sheets. This is a Group reporting Reference Guide in force in 2012. All the indicators relating to consumption and emissions are connected to the electricity and heat production processes.

The accounting data on decommissioning and last core provisions, and the end-of-life for nuclear fuel, are Group consolidated data, from the Group's accounts.

### Details on indicators pertaining to water withdrawn and returned

The cooling water indicators included water drawn from and released into rivers, the sea and the water table, and may also include water drawn from the distribution network and released into wastewater networks. For

coastal nuclear plants located by the sea, and for fossil-fired plants, the quantities of cooling water drawn and released are calculated based on operating time and the pumps' nominal discharge. The indicators relating to the "fresh water portion" (including brackish water, if applicable) have been included since 2010.

### Details on air emissions

CO<sub>2</sub> and SO<sub>2</sub> emissions from EDF's plants are calculated based on fuel analysis or standard emission factors.

CO<sub>2</sub> and SO<sub>2</sub> emissions from EDF's fossil-fired plants included all phases of electricity and heat generation from commissioning to unit shutdown.

EDF's data on SF<sub>6</sub> emissions are calculated based on the SF<sub>6</sub> cylinder mass or a nominal annual escape rate of 2% of the volume of SF<sub>6</sub> gas contained in the cylinders.

The SF<sub>6</sub> indicator for the "EDF SA + ERDF" scope was first published in 2011.

The SF<sub>6</sub> indicator for the Group scope was first published in 2012.

### Details on conventional waste

Data relating to conventional waste were obtained on the basis of the information available at the closing date on the quantities removed and the disposal channels. The reported data does not include:

- the conventional industrial waste of Dalkia International et Investissement;
- the percentage of industrial waste which is recycled in some subsidiaries such as the Polish subsidiaries and certain subsidiaries in the Asia-Pacific region.

The waste from construction and decommissioning sites are included in this reporting when the EDF group is responsible for managing them. However, the waste which service providers are responsible for managing is not taken into account. For example, the waste from construction sites is generally the responsibility of the builder (packaging for transport, scraps, pots of paint, etc.).

The 2012 reporting on waste is performed over a rolling year for ERDF. Wooden poles are now included in the reporting. Concrete pillars are excluded because the current reporting organization does not enable them to be monitored effectively.

Since 2011, the publication scope for hazardous waste, non-hazardous waste and conventional recycled industrial waste, or industrial waste which is removed for recycling has been extended to the EDF group and is no longer "EDF + ERDF".

### Details on nuclear waste

#### Concerning EDF

The indicator for "very low level radioactive waste" ("TFA") produced by decommissioning includes:

- the real tonnage of waste sent to the very low level waste storage centre ("CSTFA");

- the tonnage of waste sent to the Centraco processing plant weighted by estimated ratios calculated annually based on the feedback from Socodei over three years, to determine how much low level waste was sent to the storage centre.

All the very low level waste produced by decommissioning was sent directly to the storage centre in 2011, and in 2012.

The “solid low and intermediate level short-lived radioactive waste produced by reactors in use” indicator does not take exceptional maintenance into account (vessel head, steam generators). The volume of waste calculated corresponds to the volume of waste stored at the Aube centre (after compacting the drums, incineration and fusion). The volume of waste generated by reprocessing waste produced and processed during previous financial years has not been included.

The indicator for “solid intermediate and high-level long-lived nuclear waste” includes a degree of uncertainty linked to the conditioning ratio (number of packages effectively realized following the processing of a tonne of fuel) which can only be established definitely in retrospect, as this ratio is essentially dependent on the mix used to optimize the operations. The indicator is an estimate based on the long-term nature of current practices of conditioning long-lived waste, and which forecasts the same ratio of conditioning for the short term.

### EDF Energy

The data relating to the “intermediate-level nuclear waste” from EDF Energy's Existing Nuclear business unit are based on the inventory of radioactive waste in the United Kingdom produced by the Nuclear Decommissioning Authority. This is an estimate of the annual volume of waste which will be considered and classified as intermediate level radioactive waste at the end of the life of the nuclear production sites. These estimates include the conditioning that will be necessary to transport the waste away from the sites. All the intermediate level radioactive waste is stored at the nuclear production sites ahead of a national decision on its final handling.

“Low-level radioactive waste” includes desiccants that are transported for treatment as intermediate level waste in compliance with current regulations.

### Constellation Energy Nuclear Group

The Constellation Energy Nuclear Group (“CENG”) indicator for “solid low and intermediate level radioactive waste” concerns waste that is not highly radioactive. According to the Nuclear Regulatory Commission (“NRC”), waste in the United States is classified into three groups of low and intermediate level radioactive waste, type A, B, or C waste according to the level of radioactivity (A being the lowest level). The data reported by the CENG corresponds to the volume of treated waste removed from sites and reported to the Nuclear Regulatory Commission (volume of waste produced by the Ginna site in 2010).

Constellation Energy Nuclear Group's “delivered nuclear fuel” data represents the quantity of fuel delivered to generation sites. These quantities, which are estimated in grams of uranium, are communicated by suppliers and declared to the Nuclear Regulatory Commission.

### Details on the quantity of electricity and heat produced through renewable energy

Dalkia International's data on the production of electricity and heat from renewable energies have been included in the consolidated figures since 2012. The percentages of electricity and heat produced from renewable energies are estimated pro rata to the quantities of electricity and heat produced.

### Details on environmental expenses

The expenditure on environmental protection corresponds to the expenditure reported by the various EDF entities.

The definition adopted for expenditure on environmental protection is based on the recommendations made by the French Accounting Council (*Conseil national de la comptabilité*) on 21 October 2003 (itself based on the European recommendation of 30 May 2001). Environmental expenditure is the additional identifiable expenditure aimed at preventing, reducing or repairing the environmental damage caused or which could be caused by the company's activities.

For example, this expenditure is connected to:

- eliminating waste and efforts to reduce its quantity;
- combating ground pollution, surface water and underground water pollution;
- protecting the quality of the air and the climate;
- reducing noise emissions;
- protecting biodiversity and the natural environment;
- decommissioning power plants.

The assessment covers the costs, excluding taxes, broken down into three main categories:

- operating expenditure (including the studies relating to operating costs) excluding the expenses having previously been the subject of a provision;
- investment expenditure (including the related studies);
- provisions, including discount expenses.

### Details on social data

The establishment of the social data in this Registration Documents is based on a glossary of definitions updated in 2012.

New indicators were published in 2012 in accordance with article R. 225-102-1 of the French Commercial Code (the “Grenelle II” law). These new data are:

- the apportionment of the group's workforce by age bracket and geographical zone of the subsidiary's head office;
- the Group's total gross revenue;
- the percentage of employees eligible for bonus compensation;
- the seriousness rate (number of days off due to work accidents  $\times$  1,000 / number of hours worked);
- average number of days of absence (sickness + work accident) per employee;
- the number of occupational diseases declared to Social Security for EDF;
- the number of hours of training.

Since 2011, the population covered by the data collection is all employees with a non suspended contact of employment with one of the Group's companies.

### EDF

Since 2007, the calculation of the number of days of absence only includes absences for the following reasons: Sickness, work and travel-related

accidents as well as other reasons such as unpaid leave and unjustified absences. Absences due to social or union-related activities, pre-retirement and maternity leave are not included. The number of hours worked which is used to calculate the absenteeism rate is the number of hours theoretically worked.

### EDF and ERDF

The workforce includes personnel who are co-employed by EDF and GDF Suez. An employee who works 50% for EDF represents 0.5 of the published workforce.

The data relating to the number of accidents during the year and the number of days away from work due to work accidents at EDF are extracted from the HR IS tool (Sprint) or by default from the Safety IS (Ariane Web). If there is a difference between the number of accidents or days of absence from work accounted in Sprint and Ariane Web, the Group's rule is to take the most penalizing data between the two systems into account.

The deployment of the new training management tool at the EDF and ERDF level is causing problems in returning quantitative data on training.

### For Group data

Variations in the scope of consolidated entities are not taken into account in full in the exits and entries of the Group's subsidiaries. This is the main reason for the difference reported between the 2012 workforce and the workforce recalculated from the 2011 workforce and entries and exits.

The movements of the workforce with Electricity and Gas Industry status are considered to be transfers and not accounted as hires, resignations, or dismissals in accordance with a sector-wide collective bargaining agreement (Electricity and Gas Industry status).

Intra-group movements are accounted as "Other arrivals" and "Other departures".

The frequency rate does not include home-place of work travel related accidents. Road accidents can be taken into account when they are considered to be work accidents under local law. The number of fatal accidents included work accidents and travel related accidents involving employees. It does not include fatal accidents to sub-contractors.

Training courses are not taken into account if certificates are not received on the date of the close of the reporting.

The data on training under professionalisation contracts are not systematically taken into account.

In countries where the law does not require the number of disabled employees to be compulsorily declared, the reported data is communicated on the basis of the employees' voluntary declarations.

# F Concordance table – Annual financial report

The 2012 annual financial report contained in this reference document, prepared pursuant to Articles L. 451-1-2 of the French Monetary and Financial Code (*Code monétaire et financier*) and 222-3 of the AMF General Regulations. The annual financial report is composed of the sections of the reference document referred to in the following table:

	Reference Document sections
Certification from the person responsible of the annual financial report	Section 1.2
EDF annual financial statements	Appendix D
EDF group consolidated financial statements	Section 20.1
Extracts from the management report	Chapter 9 (Group's businesses)
	Chapter 4 (risk factors)
	Section 21.1.4 (financial authorities)
	Chapters 18 to 21 (information on share capital and capital composition, the exercise of voting rights)
	Chapters 14 and 16 (powers of the Board of Directors and Corporate Governance)
	Chapter 15 (compensation)
	Section 21.1.3 (stock repurchase program)
Statutory Auditors' Report on the EDF annual financial statements	Appendix D
Report from the Auditors on the EDF group's consolidated financial statements	Section 20.2



# **G Draft resolutions submitted to the Combined Shareholders' Meeting of 30 May 2013**

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## Meeting agenda

### Ordinary Meeting agenda

- Approval of the reports and annual financial statements for the year ended on 31 December 2012.
- Approval of the reports and consolidated financial statements for the year ended on 31 December 2012.
- Allocation of the net income for the year ended on 31 December 2012 and determination of the dividend amount.
- Option for the payment of a portion of the dividend in shares.
- Payment of interim dividends in shares – Delegation of authority to the Board of Directors.
- Agreements governed by Article L. 225-38 of the French Commercial Code.
- Authorization granted to the Board of Directors to carry out transactions on the Company's shares.

### Extraordinary Meeting agenda

- Amendment of the bylaws.
- Amendment of the articles of association - Resolution proposed by the "EDF Shares" FCP Supervisory Board and reviewed by the Board of Directors of EDF during its meeting of 3 April 2013 during which it was approved

### Ordinary and Extraordinary Meeting agenda

- Powers for completion of formalities.

## Draft resolutions submitted to the Combined Shareholders' Meeting of 30 May 2013

### Ordinary resolutions

#### First resolution

(Approval of the reports and annual financial statements for the year ended on 31 December 2012)

The Shareholders' Meeting, deliberating in compliance with the quorum and majority requirements for Ordinary Shareholders' Meetings, having reviewed the management report of the Board of Directors and the report of the Statutory Auditors, approves the annual financial statements for the financial year ended on 31 December 2012, comprising the balance sheet, the income statement and the notes, as presented, and the transactions reflected in these financial statements and summarized in these reports. It sets the profit for the financial year at €3,566,370,904.14.

The Shareholder's Meeting notes that the overall sum of expenses and charges concerned by Article 223 *quater* of the French Tax Code is €2,051,289 for the 2012 financial year and that the related tax amount is €740,515.

#### Second resolution

(Approval of the reports and consolidated financial statements for the year ended on 31 December 2012)

The Shareholders' Meeting, deliberating in compliance with the quorum and majority requirements for Ordinary Shareholders' Meetings, having reviewed the management report of the Board of Directors and the report of the Statutory Auditors on the consolidated financial statements, approves the consolidated financial statements for the financial year ended on 31 December 2012, comprising the consolidated balance sheet, the consolidated income statement and the notes, as presented, and the transactions reflected in these financial statements and summarized in these reports.

### Third resolution

(Allocation of the net income for the year ended on 31 December 2012 and determination of the dividend amount)

The Shareholders' Meeting, deliberating in compliance with the quorum and majority requirements for Ordinary Shareholders' Meetings, notes that the profit for the 2012 financial year totals €3,566,370,904.14. Taking into account the positive amount of retained earnings of €3,713,180,822.16, the distributable profit, before deduction of the interim dividend that was paid out on 17 December 2012, totals €7,279,551,726.30.

The Shareholders' Meeting decides to set the dividend for the 2012 financial year at €1.25 per share. Given that an interim dividend of €0.57 per share was paid out on 17 December 2012, the balance of the dividend to be distributed for the 2012 financial year amounts to €0.68 per share.

Consequently, the distributable profit is allocated as follows:

(€)	
Profit for the financial year ended 31 December 2012	3,566,370,904.14
Retained earnings (before deduction of the 2012 interim dividend)	3,713,180,822.16
<b>Total distributable profit</b>	<b>7,279,551,726.30</b>
<b>Total dividend for the financial year ended 31 December 2012 *</b>	<b>2,311,083,327.50</b>
Interim dividend paid out on 17 December 2012 to be deducted from the 2012 dividend (i.e. €0.57 per share) **	1,052,601,974.10
<b>Balance of the dividend to be distributed for the financial year ended 31 December 2012 * (i.e. €0.68 per share)</b>	<b>1,257,229,330.16</b>

\* On the basis of the number of shares constituting the share capital on 31 December 2012, i.e. 1,848,866,662 shares.

\*\* On the basis of the number of shares that grant entitlement to dividends at the date of payment of the interim dividend.

When the balance of the dividend is paid out, any shares held by the Company at the date of distribution of the dividend will not confer rights to the dividend.

The balance of the distributable profit (after deduction of the dividend for the financial year ended on 31 December 2012) will be allocated to the "retained earnings" account.

The ex-date for the dividend is 6 June 2013 and the balance of the dividend to be distributed will be paid out on 8 July 2013.

The Shareholders' Meeting grants full powers to the Board of Directors to determine, in particular in light of the number of shares held by the Company at the date of payment, the total amount of the dividend and, consequently, the amount of the balance of distributable profits allocated to the "retained earnings" account.

The Shareholders' Meeting acknowledges that the dividends distributed in the past three years were as follows:

Financial year	Number of shares	Dividend per share (€)	Total dividends distributed <sup>(1)</sup> (€)	Portion of the dividend eligible for the tax allowance <sup>(2)</sup>
2009	1,848,866,662	1.15	2,111,146,365.85	100%
2010	1,848,866,662	1.15	2,122,291,972.68	100%
2011	1,848,866,662	1.15	2,124,757,978.20	100%

(1) After deduction of treasury shares.

(2) 40% tax allowance under paragraph 3-2° of Article 158 of the French Tax Code.

## Fourth resolution

### (Option for the payment of a portion of the dividend in shares)

The Shareholders' Meeting, having reviewed the report of the Board of Directors and noted that the capital is paid up in full, decides, in accordance with Article L. 232-18 of the French Commercial Code and Article 25 of the Company's bylaws, to offer each shareholder the possibility of choosing payment in new Company shares for a portion of €0.10 of the balance of €0.68 per share of the dividend that remains to be distributed for the financial year ended on 31 December 2012.

Each shareholder may choose either method of payment, however this choice will apply identically to all the shares held.

For shareholders who opt for payment in shares, the new shares will be issued at a price equal to 90% of the average of the opening prices of the EDF shares listed on the Euronext Paris regulated market over the 20 trading days prior to the date of the Shareholders' Meeting, less the amount of the 2012 remaining dividend to be paid, rounded up to the next highest euro cent.

The ordinary new shares issued as payment will confer the same rights as the existing shares and will be issued with immediate dividend rights, i.e. they will grant entitlement to all dividends paid out as from their date of issue.

Shareholders may exercise this option between 6 June 2013 and 26 June 2013 inclusive, by sending their request to the authorized financial intermediaries or, for shareholders registered in the accounts of directly registered shares held by the Company, to its agent (BNP Paribas Securities Services – Service OST – 9, rue du Débarcadère – 93761 Pantin Cedex). Shareholders who do not exercise their option by 26 June 2013 will receive the full balance of the dividend in cash.

Shareholders who have not opted for payment in shares will receive the balance of the dividend on 8 July 2013. For shareholders who opted for payment in shares, payment will be made through delivery of the shares on the same date.

In the event the dividend is paid to individuals who have their tax residence in France, the total dividend is eligible for the special 40% tax allowance provided for by paragraph 3-2° of Article 158 of the French Tax Code. In addition, under Article 117 *quater* of the French Tax Code, dividends and assimilated income received as from 2013 by individuals who have their tax domicile in France are subject to mandatory withholding tax of 21%, which does not grant final discharge but is deemed an advance payment of income tax. Under Article 242 *quater* of this code, taxpayers who are members of a fiscal household for which the reference taxable income for the penultimate year prior to the payment of the incomes does not exceed a specified threshold may apply for exemption from this withholding in accordance with the terms and timeframes specified by the said same article.

If the amount for which the option is exercised does not correspond to a whole number of shares, shareholders will receive the nearest lowest number of whole shares, plus cash compensation for the difference.

The Shareholders' Meeting grants full authority to the Board of Directors, with authorization to sub-delegate such authority to the Chairman of the Board of Directors under the conditions provided for by law, in order to implement the payment of a portion of the dividend in new shares, to specify the terms and conditions of application and performance, to acknowledge the number of new shares issued pursuant to this resolution and to make all requisite amendments to the bylaws concerning the share capital and the number of shares that make up the share capital and, more generally, to take all useful or necessary steps.

## Fifth resolution

### (Payment of interim dividends in shares – Delegation of authority to the Board of Directors)

In accordance with Article 25 of the Company's bylaws, the Shareholders' Meeting, acting in accordance with the quorum and majority requirements for Ordinary Shareholders' Meetings and having reviewed the report of the Board of Directors, in the event that the Board decides to pay one or more interim dividends in respect of the 2013 financial year, authorizes the Board of Directors to give the shareholders, for all or a portion of the interim dividends, the choice of payment in cash or in shares.

If the shareholders opt for the payment of the interim dividend in shares, the shares subscribed will be common shares. These shares will have the same characteristics and will grant access to the same rights as the existing shares and will be issued with immediate dividend rights, i.e. they will grant entitlement to all dividends paid out as from their date of subscription.

The Board of Directors will set the period of time, following its decision to pay an interim dividend, during which the shareholders will be entitled to request the payment of this interim dividend in shares. This period of time may not, however, exceed three months.

The issue price of the new shares will be equal to the average of opening market prices of Company shares on Euronext Paris's regulated market during the 20 consecutive trading days prior to the decision to pay the interim dividend, reduced by the net amount of the interim dividend and, if so decided by the Board of Directors, by a discount of up to 10%, and rounded upwards to the nearest euro cent.

If the amount for which the option is exercised does not correspond to a whole number of shares, shareholders will receive the nearest lowest number of whole shares, plus cash compensation for the difference.

Full authority is granted to the Board of Directors, with authorization to sub-delegate such authority to the Chairman of the Board of Directors under the conditions provided for by law, to take all steps required for the payment of interim dividends in shares, if it were to decide the distribution of an interim dividend and its payment in shares, to acknowledge the increase of capital resulting therefrom and to amend the bylaws accordingly and, more generally, to take all useful or necessary steps.

### Sixth resolution

**(Agreements governed by Article L. 225-38 of the French Commercial Code)**

The Shareholders' Meeting, deliberating in compliance with the quorum and majority requirements for Ordinary Shareholders' Meetings, having reviewed the special report of the Statutory Auditors on agreements governed by Article L. 225-38 of the French Commercial Code, takes note of the conclusions of this report and that no agreements were entered into during the 2012 financial year.

### Seventh resolution

**(Authorization granted to the Board of Directors to carry out transactions on the Company's shares)**

The Shareholders' Meeting, deliberating in compliance with the quorum and majority requirements for Ordinary Shareholders' Meetings, having reviewed the report of the Board of Directors:

- terminates, with immediate effect, for the unused portion, the authorization to purchase shares in the Company given by the Shareholders' Meeting of 24 May 2012 in the fifth resolution;
- authorizes the Board of Directors to purchase shares in the Company with a view to:
  - delivering shares when exercising rights attached to securities giving access to the share capital by reimbursement, conversion, exchange, submission of a warrant or by any other means, immediately or at a later date, as well as carrying out all hedging transactions with respect to the Company's (or one of its subsidiaries') obligations in connection with such securities,
  - holding shares for their subsequent delivery as a means of exchange or payment in the context of any external growth or contribution transactions,

- ensuring the liquidity of EDF's share by an investment service provider through a liquidity agreement in accordance with the Code of Ethics recognized by the French market authority,
- allocating shares to employees of the EDF Group, especially under any share purchase or free share allocation plan benefiting to current or former employees under the conditions provided by the law, in particular under Articles L. 225-197-1 and following of the French Commercial Code, Articles L. 3332-18 and following of the French Labor Code (including any transfer of shares covered by these articles of the French Labor Code),
- reducing the Company's capital by canceling all or some of the shares purchased, pursuant to the 14th resolution adopted by the Shareholders' Meeting of 24 May 2012.

Purchases of shares in the Company may concern a number of shares such that:

- the number of shares acquired by the Company during the repurchase program may not exceed 10% of shares which constitute the share capital as of the day of this Shareholders' Meeting, it being specified that when shares are redeemed to ensure the liquidity of the EDF share under the conditions defined above, the number of shares taken into account for calculating this 10% limit is the number of shares purchased net of the number of shares sold during the term of this authorization;
- the number of shares the Company holds directly or indirectly at any time must not exceed 10% of the shares constituting the Company's share capital.

Acquisitions or transfers of these shares may be carried out by all means, particularly on the over the-counter market, including through acquisition or transfer of blocks, use of derivative financial instruments or notes or securities giving access to the Company's shares, or by implementing stock option strategies, at such times when the Board of Directors or the person acting by delegation of the Board of Directors shall decide.

The maximum amount of funds dedicated to the execution of this share repurchase program shall be 2 billion euros.

The purchase price shall not exceed €60 per share; however, the Board of Directors may adjust the maximum purchase price in the event of capitalization of premiums, reserves or profits resulting in either a rise in the nominal value of shares or in creation and attribution of free shares, and in the event of a share split or reverse share split, or any other operation affecting equity, to reflect the effect of these transactions on the share value.

This authorization is granted for a maximum duration of 18 months from the date of this meeting.

The Shareholders' Meeting grants all powers to the Board of Directors to implement this authorization, which may delegate its authority, in order to place all orders in the stock exchange or off-market, allocate or reallocate the shares acquired to the various objectives pursued, under the applicable legal and regulatory conditions, complete all formalities, and in general do everything that is necessary.

The Board of Directors must inform the Shareholders' Meeting each year of the transactions undertaken pursuant to this resolution.

## Extraordinary resolutions

### Eighth resolution

(Amendment of the bylaws)

The Shareholders' Meeting, deliberating in compliance with the quorum and majority requirements for Extraordinary Shareholders' Meetings, having reviewed the Board of Directors' report, decides, as a result of French Laws no. 46-628 of 8 April 1946, no. 2000-108 of 10 February 2000 and no. 2004-803 of 9 April 2004 being incorporated into the French Energy Code, to replace the references to said laws (or to the articles of said laws) in the Company's bylaws by a reference to the French Energy Code (or to the corresponding article of the French Energy Code). Consequently:

- the wording of Article 1 (Form) of the Company's bylaws will now read as follows:

*"Electricité de France (EDF) is a public limited company governed by the laws and regulations applicable to commercial companies, and more especially the Commercial Code, insofar as it is not overridden by more specific provisions such as the Energy Code, Law no. 83-675 of 26 July 1983, and by these articles of association";*

- the wording of paragraph 3 of Article 2 (Corporate Purpose) of the Company's bylaws will now read as follows:

*"Ensure the public service missions assigned to EDF by the laws and regulations, especially the Energy Code and Article L. 2224-31 of the Code général des collectivités territoriales as well as by the concession agreements, and in particular the assignments for the development and operation of the public electricity networks and the assignments for the supply of electricity at regulated prices, the supply of electricity, in the event of emergency, to producers and to customers suffering from unforeseen failures in supplies and the supply of electricity to eligible customers who are unable to find a supplier, contributing to ensure the balanced development of the electricity supply by the achievement of the targets defined by the pluri-annual programme of investments in generation decided by the minister in charge of energy";*

- the wording of paragraph 2 of Article 6 (Share Capital) of the Company's bylaws will now read as follows:

*"Pursuant to the provisions of Article L. 111-67 of the Energy Code, the French State should, at all times, hold more than 70% of the Company's capital."*

### Ninth resolution

(Amendment of the articles of association - Resolution proposed by the "EDF Shares" FCP Supervisory Board and reviewed by the Board of Directors of EDF during its meeting of 3 April 2013 during which it was approved)

- The text of the second paragraph of Article 16 of the articles of association is amended as follows:

*"The Board of Directors may decide to establish specialised consultative committees from among its members, in particular an audit committee, a strategy committee, and a compensation committee. It determines the duties of said committees along with their composition, which must provide for at least one employee director. The committees report to the Board with regard to the performance of their assignments."*

## Ordinary and extraordinary agenda

### Tenth resolution

(Powers for completion of the formalities)

The Shareholders' Meeting grants all powers to the bearer of an original, a copy or an extract of the minutes of this meeting to carry out all legal and administrative formalities, and file and register all information required by the laws in force.

## **Investors Relations**

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## **Websites**

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