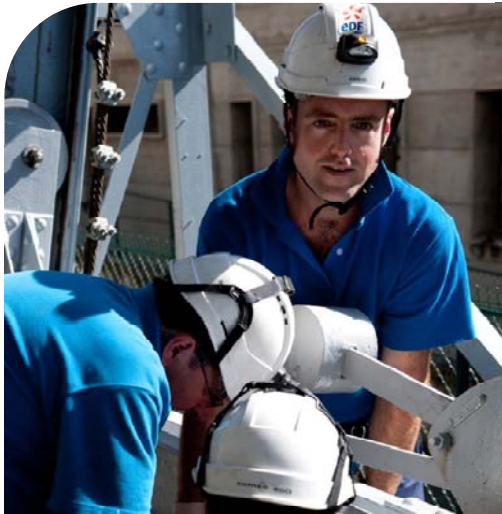


# Year 2011

# Facts & Figures



# Disclaimer

This presentation does not constitute an offer to sell securities in the United States or any other jurisdiction.

No reliance should be placed on the accuracy, completeness or correctness of the information or opinions contained in this presentation, and none of EDF representatives shall bear any liability for any loss arising from any use of this presentation or its contents. The present document may contain forward-looking statements and targets concerning, for example, the Group's strategy, financial position or results, which do not constitute a guarantee of future performance or results of the company. EDF considers that these forward-looking statements and targets are based on reasonable assumptions, which can be however inaccurate and are subject to numerous risks and uncertainties, many of which are outside the control of the company, and as a result of which actual results may differ materially from expected results. Important factors that could cause actual results, performance or achievements of the Group to differ materially from those contemplated in this document include in particular the successful implementation of EDF strategic, financial and operational initiatives based on its current business model as an integrated operator, changes in the competitive and regulatory framework of the energy markets, as well as risk and uncertainties relating to the Group's activities, the climatic environment, the volatility of raw materials prices and currency exchange rates, the strengthening of safety regulations, technological changes, changes in the general economic and political conditions in the countries where the Group operates, and risk and uncertainties relating to the consequences of the nuclear accident in Japan.

Detailed information regarding these uncertainties and potential risks are available in the reference document (Document de référence) of EDF filed with the Autorité des marchés financiers on April 10, 2012, which is available on the AMF's website at [www.amf-france.org](http://www.amf-france.org) and on EDF's website at [www.edf.com](http://www.edf.com).

EDF does not undertake, nor does it have any obligation to provide updates of the information contained in this presentation.

## Before starting...

- Since 31/12/2010, RTE is consolidated under the equity method
- A lot of “technical” words or acronyms are used within this document
- To help you understand the terms used, each time you see a blue asterisk (\*), you will find the word in the glossary at the end of the document (in the Appendices section)
- Moreover, you will find throughout the document some « Did you know? » take-away boxes, which enlighten a specific concept
- Many other information are available in our reference document, which you can download under:

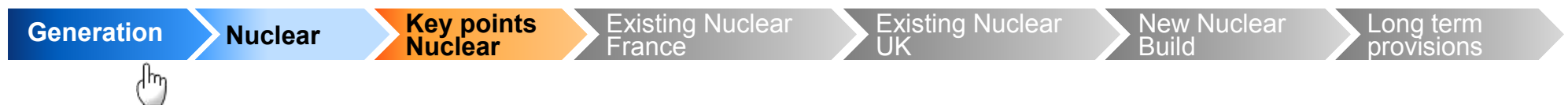
<http://shareholders-and-investors.edf.com/news-and-publications/reference-documents-45430.html>

## Get the most of this document!

- To help you navigate through this document, hypertext links haven been incorporated
- A click on the EDF logo (on the bottom right of each page) will bring you back to the Agenda p.5
- Within the document, a “title bar” indicates in which part of the document you are in. A click on the orange arrow with the name of the part will bring you back to the beginning of this part:



- More specifically, for the part “Main businesses”, this system has been extended to sub parts. A click on the arrows of the “title bar” will bring you back to the beginning of the sub part:





# Agenda

The EDF Group

EDF main businesses

EDF within the energy sector and derived strategy

Financials

Market data

Appendices

# Year 2011

# Facts & Figures



## The EDF Group



The EDF Group

EDF main businesses

EDF within the energy sector  
and derived strategy

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Market data

Appendices

## The EDF Group

Overview of the EDF Group

A state-owned listed company

Country profiles

# Investment Case

## An integrated model optimizing the whole value chain

- Worldwide leader in the electricity sector, #1 nuclear operator
- Operational excellence and valuable experience across the electricity value chain (generation, networks, supply and trading)
- A reinforced financial solidity with the highest credit rating in the industry, backed by a very strong liquidity position

## Strong defensive characteristics in a difficult economic environment

- Strong ties to the French State (~85% ownership)
- Much of EDF business is regulated (networks) or highly visible (tariffs, PPA...)
- A lower exposure to commodity price risks compared to its peers

## Well positioned to thrive in a low carbon world

- A low-carbon strategy driven by nuclear and renewables (EDF Energies Nouvelles is now 100% owned by the EDF group)

## Execution strategy, based around 3 pillars

### 1 Improved and sustainable operational performance

- Improved nuclear output, both in France and in the UK
- Improved operational performance of the leading French Distributor
- Remain the most competitive electricity supplier

### 2 Become the electric company of choice across the whole value chain

- Full control of EDF Energies Nouvelles, a leader in renewables
- Full control of Edison, which will spearhead EDF's gas strategy

### 3 Invest selectively to drive future growth

- Up to €15bn in 2015, of which €4-6bn in growth capex
- Challenging investment criteria (WACC + 300 bp)
- Maintain the best credit rating in the industry

# EDF Group key figures

## Operational figures (2011)

- **~37.7 million clients** worldwide (gas and electricity)
- **134.6 GW\*** installed worldwide
  - o/w **74.8 GW** nuclear
  - 34.5 GW** thermal plants
  - 25.3 GW** hydropower and renewable
- **~ 1.4 M** km of networks, both for Transmission and Distribution thanks to its affiliated companies
- **~160,000** employees
  - o/w ~37,000 in French distribution
  - o/w ~67,000 in French generation and engineering
  - o/w ~ 15,500 in EDF Energy

## Financials (2011)

- Sales: **€65bn**
- EBITDA: **€14.8bn**
- Net financial debt: **€33.3bn**
- Ratings (31/01/2012): **A+** (S&P) / **Aa3** (Moody's) / **A+** (Fitch) / **AA+** (JCR)

## Environmental and social responsibility (2011)

- Vigeo: overall score of **60/100**
- Carbon Disclosure Leadership Index: **62%**

## The EDF Executive Committee (1/2)



**Henri PROGLIO:**  
Chairman and CEO

A graduate from HEC, Henri Proglío has been appointed Chairman and CEO of EDF in November 2009, after being a non-executive director since September 2004. Before that, he was Chairman and CEO of Veolia Environnement from 2003 to November 2009. He is also a non-executive director in other CAC 40 groups. On top of that, he is a member of Committee for Atomic Energy, of the Committee for Transparency and Information on Nuclear Safety as well as Chairman of the association Electra



**Marianne LAIGNEAU:**  
Group Senior Executive  
Vice President,  
Human Resources

A graduate of the “*Ecole Normale Supérieure de Sèvres*”, the “*Ecole Nationale d'Administration*” and the “*Institut d'Etudes Politiques*” in Paris, she also holds an aggregation in Classics and a Masters Degree in French Literature. She joined the Council of State in 1992 and became Counselor since 2007. In December 2010, she has been appointed Group Senior Executive Vice President Human Resources, after having been Corporate Secretary from June 2007 to December 2009 and General Counsel from January 2005 to December 2009



**Pierre LEDERER<sup>(1)</sup>:**  
Group Senior Executive  
Vice President,  
Customers, Optimization  
and Trading

A graduate of Physical Science and Mathematics, Pierre Lederer joined EDF in 1974 where he occupied a variety of positions in the General Economic Studies Department, the Energy Transmission Department and the Thermal Generation. In 2000, he joined the Executive Management Board of EnBW and became Vice President in 2007. February 2009, Pierre Lederer was appointed Senior Executive Vice President of EDF S.A., in charge of Customers, Optimization and Trading. He also supervises the Continental Europe zone



**Hervé MACHENAUD:**  
Group Senior Executive  
Vice President,  
Generation

A former student of the “Ecole Polytechnique” technical school (1968), engineer of the “Ecole des Ponts et Chaussées” and a graduate of the “Institut d'Etudes Politiques” in Paris. After a variety of assignments at the Ivory Coast Ministry of Planning and for the World Bank, he joined EDF in 1982, where he was among other in charge of the Group's French and International nuclear programs, as well as of the development of the Group in Asia-Pacific. Since 2009, he is Group Senior Executive Vice President, Generation. He also supervises the Asia-Pacific zone



## The EDF Executive Committee (2/2)



**Jean-Louis MATHIAS:**  
Group Senior Executive  
Vice President,  
Activities Coordination in France

A graduate of the “Ecole Polytechnique” technical school, of ENSAE, of the “Centre de Perfectionnement aux Affaires” and holds a degree in Sociology . After having been Senior executive Vice President of Gaz de France from June 2002 to August 2004, He joined EDF in September 2004 as Chief Operating Officer, and then became Group Senior Executive Vice President, Activities Coordination in France. He is also responsible for renewable energy sources systems and gas systems



**Thomas PIQUEMAL:**  
Group Senior Executive  
Vice President,  
Finance

A graduate of ESSEC. After holding several positions at the investment bank Lazard Frères, he became in January 2009 Senior Executive Vice President in charge of Finance and joined the Group’s Executive Committee. He joined the EDF Group in December 2009, as Group Senior Executive Vice president, Finance. He also supervises the United States zone.

In 2008, Thomas Piquemal co-founded the “Académie Christophe Tiozzo”, whose mission is to promote the social and professional integration of young people from deprived areas



**Vincent de RIVAZ:**  
Chief Executive  
of EDF Energy

A graduate of the “Ecole Nationale Supérieure d’Hydraulique de Grenoble”, he held various positions within the Group, especially regarding international development. In mid-2003, he created EDF Energy and has since been Chief Executive Officer. He supervises the United Kingdom area.

He was named National Ambassador by HRH the Prince of Wales, in July 2009, for his significant contribution to the Prince’s Business in the Community projects



**Alain TCHERNONOG:**  
General Secretary

A PhD in Law and a graduate of the “Institut d’Administration d’Entreprises”, he held various positions in different companies. In March 2007, he became Coporate Secretary of Veolia Environnement. In December 2009, he was appointed Coporate Secretary of the EDF Group. He also supervises, among others, information systems

# EDF since 1946

## Structural changes in the EDF Group

Nationalization of the electricity and gas sectors  
Creation of EDF as an EPIC\* by the Law of 8 April 1946

Opening of the French market, first for B2B (2000 to 2004), then for B2C from 2007

On 20 November 2004, EDF becomes a French SA

IPO<sup>(1)</sup> in 2005 and creation of RTE\* to guarantee non-discriminatory access to the market

1946

1963

1990

2000

2004

2005

2009

2010

2011

## Development in France

Launch of the commercial-scale nuclear program

Development of the French industrial base, including Hydro and Nuclear facilities

## International Development

Acquisition of British Energy

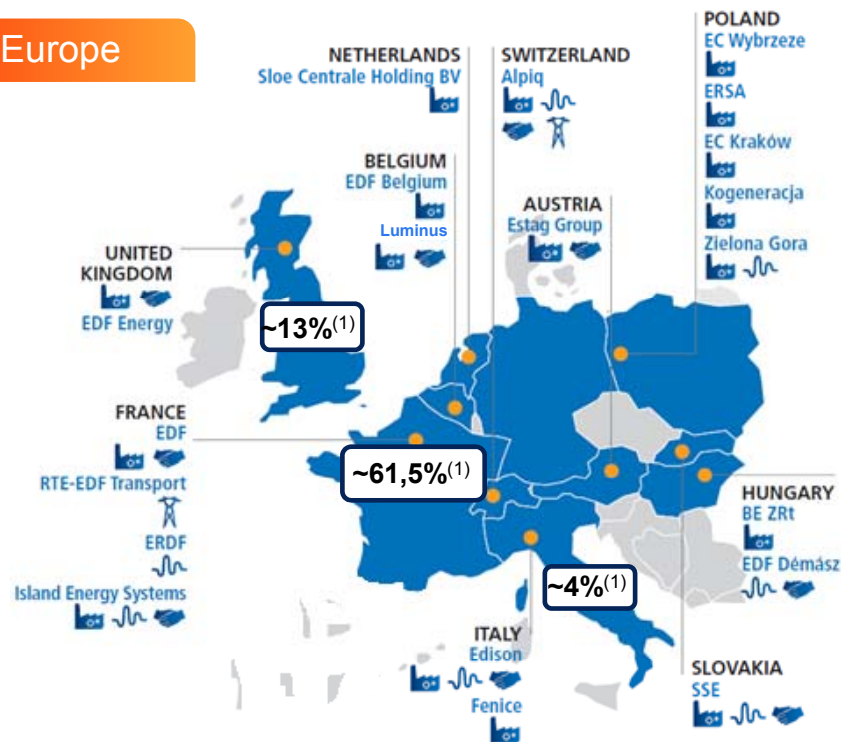
Disposal of EnBW and of the UK networks

Buy-out of EDF Energies nouvelles

Start of the international development, first in South America, then in Europe with the UK (from 1998 onwards), Germany (2001) and Italy (2005) ; increased focus on Asia

# EDF global footprint

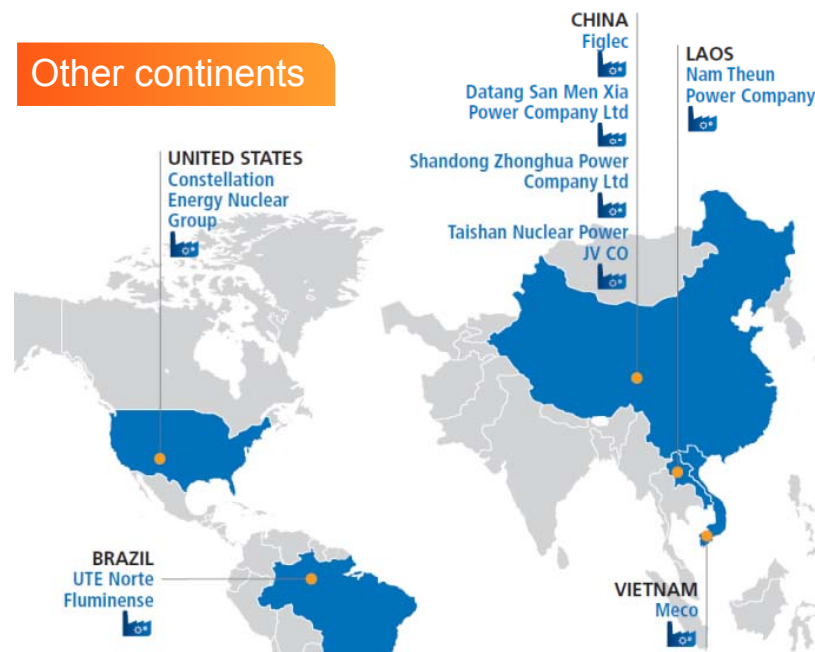
## Europe



### Recent developments

- Sale of UK Networks in October 2010
- Sale of EnBW in December 2010
- EDF owns 100% of EDF EN since August 2011

## Other continents



## Other businesses

EDF Énergies Nouvelles  
Tiru  
Électricité de Strasbourg  
Dalkia  
EDF Trading

Generation  
Distribution  
Services  
Transmission

### Did you know?

**628.2 TWh**  
Global generation  
~80% nuclear  
~8% fossil fired  
~7% renewables<sup>(2)</sup>  
~5% gas

**37.7 million**  
Customers

**€14.8bn**  
EBITDA (2011)

<sup>(2)</sup>Including hydropower



(1) In % of Group EBITDA in 2011, Edison is consolidated at 48.96%

# Human resources at EDF

As an industrial group, (with a high level of technological expertise, over long term activities and which involve “public service” missions), EDF is keen to durably invest in the competences and the performance of its staff

## ■ Investing in training

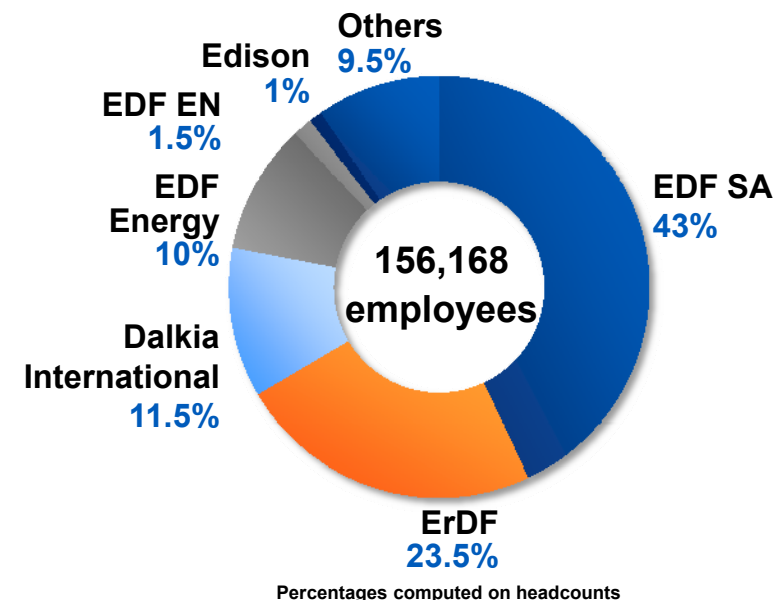
- Almost 119,000 employees got a training in 2011 (on average, 47 hours per employee), with a total investment which accounts for 7% of personal expenses

## ■ Hiring to renew the skillset

- Over 20% of French employees<sup>(1)</sup> could go into retirement by 2016, in particular in the generation, engineering and distribution, which account for 2/3 of headcount in France
- Until 2014, the Group will maintain a level of recruitment that is adapted to these stakes and reaffirms its commitment to apprenticeship, which is a source of diversity and competences. In 2011, over 12,000 people were recruited, almost half of which at EDF SA and ErDF

## ■ ...all the more since EDF is committed to invest more in nuclear safety

- EDF will strengthen its shift teams on nuclear sites in accordance with the additional measures discussed with the French Safety Authority on the post Fukushima
- EDF is also going to set up the “FARN” (nuclear rapid-response force), whose mission is to intervene within 24h in support of the shift teams in case of accident



Did you know?

**In France**, one-third of employees are in distribution, one-third in generation and engineering

# The EDF group is present across the whole electricity value chain (EDF group main assets)

	Generation (GW installed)	Transmission	Distribution	Supply (#customers)
		Networks		
France (inc. SEI)	EDF SA: 99.3 GW	RTE <sup>(2)</sup> (100%): 100,000km	ErDF (100%): 1.3 M km	EDF SA: ~ 26 M
United Kingdom	EDF Energy: 13.0 GW			EDF Energy: ~5.8 M
Italy	Edison <sup>(1)</sup> : 5.6 GW Fenice: 0.4 GW			Edison: ~0.6 M
Belgium	EDF Luminus: 2.1 GW EDF Belgium: 0.5 GW			EDF Luminus: ~1.7 M
United States	EDF Inc: 2 GW			
Other	Other International: 5.9 GW (o/w Poland, Slovakia, Hungary)	Demasz (100%): 32,000 km SSE (49%): 33,500 km		Demasz: ~770,000 SSE: ~640,000 ESTAG: >500,000
Other activities:	Other activities: 5.8 GW o/w EDF EN: 3.3 GW			

## Supporting activities

Trading activities: EDF Trading  
Energy services: Dalkia, Fenice

## Did you know?

EDF is also active in third-party management, in contractual engineering through partnerships:

- in the networks business (e.g. with MRSK in Russia),
- in the optimization business (e.g. 15 GW optimized by EDF Trading in the US),
- in the operation & maintenance business (e.g. EnXco in the US)
- in generation (e.g. Nam Theun Dam in Laos)

## EDF SA governance as at end 2011

### Audit Committee

2 representatives are appointed by the French Government

### Board of Directors (18)

6 representatives appointed by the French Government, 6 by the General Assembly and 6 elected by employees

### Ethics Committee

1 representative is appointed by the French Government

### Nuclear Commitments Monitoring Committee

2 representatives are appointed by the French Government

### Nominations and compensation committee

1 representative is appointed by the French Government

### Strategy Committee

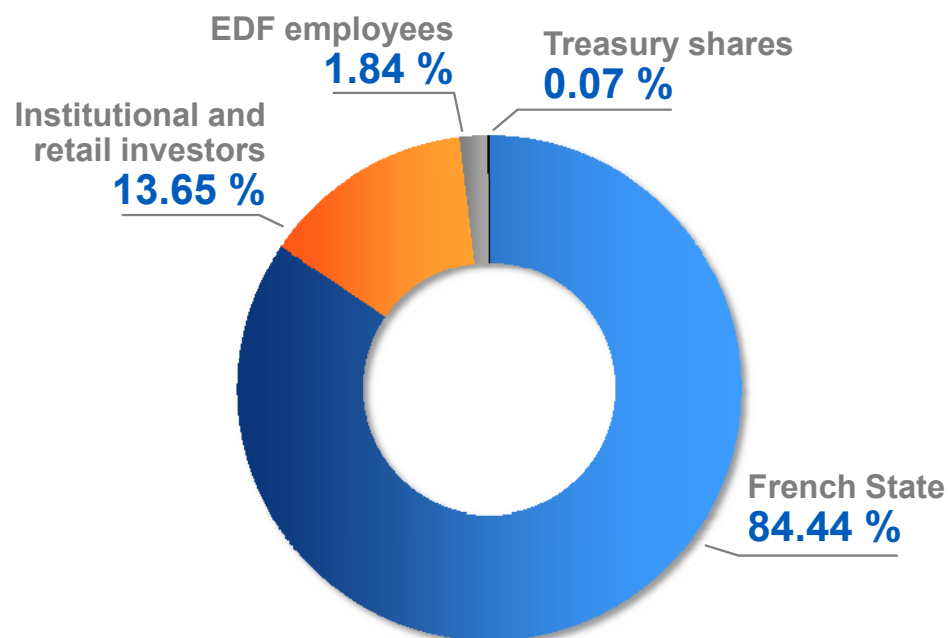
3 representatives are appointed by the French Government and since 2010 all the board members have been invited to join the Committee



## Shareholders' General Assembly

# EDF: a listed company with the French State as the major shareholder (1/2)

## Shareholders as of 31 December 2011



By Law, the French State must hold at least 70% of EDF's share capital

## Share information

Common shares	
# of shares	1,848,866,662
# of shares outstanding	1,847,691,068
Number of treasury shares	1,175,594
French security identification N° (ISIN code)	FR0010242511
Main index	CAC 40, Euro Stoxx Utilities, Dow Jones Euro Stoxx 50, Euronext 100, FTS Euro First
Listing	Paris (Reuters: EDF.PA , Bloomberg: EDF FP)



# EDF: a listed company with the French State as the major shareholder (2/2)

## EDF as a state-owned company: legal and contractual framework

- EDF's CEO is proposed by the board members, and appointed by decree of the French President upon proposal by the Board of Directors (Law of 26 July 1983)
- In accordance with article 13 of the Constitution, the CEO and Chairman is appointed based on the candidates' interviews and the opinion of the permanent committees of the French National Assembly and Senate.
- The Board of Directors is composed of 18 members, one third of whom are French government representatives (Law of 26 July 1983)
- Any decision related to financials, investments, acquisitions and disposals must be approved by the government (Decree of 9 August 1953)
- Numerous controls of financials by different authorities : State Comptroller, Cour des Comptes (Government auditing agency), Inspection des Finances
- The French State Holdings Agency ("APE\*\*") represents the State as being a shareholder
- Main contractual agreements are reviewed by the specific Market Commission (Decree of 18 September 1948)

## EDF as a listed company: corporate governance

- EDF has to abide by listed companies laws and specific standards of a public sector entity
- Internal rules of its board of Directors are similar to those of listed companies
- In accordance with law of 27 January 2011 relating to the balanced representation of women and men on Boards of Directors and Supervisory Boards, the proportion of directors of each gender appointed by EDF's Shareholders Meeting may not be less than 20% from 2014, then 40% from 2017. In 2012, EDF's Board is composed of 4 women, representing 22%.
- EDF decided in December 2008 to refer to the AFEP- MEDEF Code of October 2008 (revised in April 2010) as its corporate governance code :
  - Annual report on the evolution of the board's functioning entrusted to an external firm every three years. Regular update of the Board of Directors rules of procedure.
  - The board has appointed all the appropriate committees
- EDF is compliant with internal control procedures COSO\*
- EDF publishes an annual report on sustainable development
  - For 2010, according to Vigeo, EDF is the leading CSR performer in its sector, with an overall score of 60/100

# EDF's interface with the French State Shareholding Agency (APE)

- The French State Shareholding Agency (APE) has been set up to fulfill the role of French State as a shareholder in public sector companies
- Its main objectives consist of:
  - Reviewing the appropriateness and financial health of the company
  - Representing the French Government during Shareholders' meeting
  - Ensuring transparency
  - Helping for the good relationship between the company and the French government
- As a result, the APE has expressed the following requirements to public sector enterprises. They have to:
  - Abide by the internal codes of committees (audit, strategy, ...) and ensure a good functioning of its social boards
  - Appoint specific point of contacts to be special correspondents with the APE
  - Prepare a scorecard reporting for the APE on the main financials and qualitative data
  - Organize regular meetings, at least once a year to present the strategy of the company, the financing part,...
  - Inform the APE for any investment operation, or any specific audit missions

## Other main regulatory bodies in France with an impact on EDF

- The ASN\* (French nuclear safety authority), in charge of control of the safety of nuclear facilities in France. The ASN carries out
  - On-site regulatory inspections, randomly or scheduled (approx. 400 per year )
  - 10-year safety reviews, a necessary step in extending the life of power plants
  - In charge of post Fukushima additional safety assessments
- The CRE\*, in charge of ensuring energy markets (gas and electricity) are working well to the benefits of final consumers. Areas of regulation include
  - Energy networks
    - Access to regulated networks and their development
    - Independence of network operators
  - Energy markets
    - Monitor deals on energy markets
    - Monitor retail markets (including making proposals for regulated tariffs' evolution)

# France - country profile

## Key points

- EDF SA is active on the whole electricity value chain, from generation to sales and trading. The activities can be split
  - **into deregulated activities**, through EDF SA (generation + sales, optimisation and trading)
  - **into regulated activities**, through ErDF (distribution) and RTE (Transmission). EDF activities in Island Energy Systems (Corsica, French overseas departments and Saint Pierre et Miquelon) are managed by the Island Energy Systems Division
- EDF SA has the largest nuclear fleet worldwide, the largest European electricity generation fleet, and is committed to operational performance and safety
- Besides, EDF SA has an extensive experience in hydropower, conventional fuels and renewables (strengthened by the buy out of EDF Energies Nouvelles)
- RTE<sup>(1)</sup> and ErDF are 100% subsidiaries of EDF SA, but are operationally independent (legal unbundling), as requested by the EU legislation
- EDF SA plays also a holding role, by controlling 100% of EDF International (controlling the greatest part of EDF stakes in international subsidiaries) as well as by detaining participations in various companies, among them
  - **EDEV** (o/w EDF EN, LNG Dunkerque, Electricité de Strasbourg...)
  - **Dalkia** (energy services provider)
  - **EDF Trading** (market operator for EDF SA)

<sup>(1)</sup> Including 50% of Edipower

<sup>(2)</sup> Consolidated under the equity method

## Installed capacity and generation (2011)

	MW	%
Nuclear	63,130	63.6
Hydropower	20,407	20.5
Fossil-fuel fired	15,757	15.9
Other renewables <sup>(1)</sup>	12	0.00
<b>Total</b>	<b>99,306</b>	<b>100</b>

	GWh	%
Nuclear	421,078	89.2
Hydropower <sup>(2)</sup>	34,282	7.3
Fossil-fuel fired	16,335	3.4
Other renewables <sup>(1)</sup>	541	0.1
<b>Total</b>	<b>472,235</b>	<b>100</b>

## Key figures (2011)

€bn	EBITDA
Deregulated	<b>6.0</b>
Regulated (excl. RTE)	<b>3.1</b>

<sup>(1)</sup> Without EDF Energies Nouvelles

<sup>(2)</sup> Including the tidal power plant in the Rance

# Market development in France

## ■ Brief history of French market liberalization:

- Nationalization of the electricity and gas sectors pursuant to the Law of 8 April 1946
- From February 1999, progressive opening of the electricity market under the impetus of European regulation, first for B2B consumers (total liberalization in July 2004), then for B2C consumers from 2007 onwards
- As at 31 December 2011, EDF had a market share of approx. 80,2% in the electricity business (B2B and B2C), whereas competitor suppliers had a 5% share of the residential market and 8% of non-residential sites according to the French Energy Regulation Commission ("CRE")

## ■ To improve and foster competition on the French market, impaired by the competitiveness of the EDF nuclear fleet, implementation of a new law on 7 December 2010 : the NOME Law (applied first on 1 July 2011)

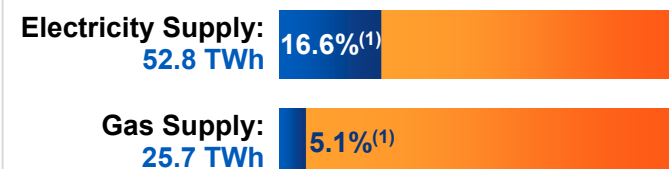
- The Law guarantees to competitors an access to the historical nuclear generation capacity ("ARENH<sup>(1)</sup>"), provided they supply only their French end users
- The delivery loads in total cannot exceed 100 TWh (excluding supply of losses) for deliveries to end users. It would last for a period of 15 years.
- The ARENH price is set by decree from Economy and Energy ministers following a legal opinion from the CRE for the first 3 years, by 2014 at the latest according to a proposal by the CRE
- An indexation formula is still to be enacted and should cover all the costs of EDF's historical nuclear plants
- All existing tariffs should converge towards ARENH prices by 2015, and industrial tariffs should be suppressed
- The ARENH price as at 1 January 2012 has been set at €42/MWh

# UK - country profile

## Key points

- **Main entity:** EDF Energy, one of the UK's largest energy companies and the UK's largest producer of low-carbon electricity
- The company sold its Network business in 2010 and is now organized into the following business units :
  - Nuclear Generation** (15 reactors on 8 nuclear power stations, 8.8 GW of capacity, 20% owned by Centrica)
  - Nuclear New Build** (in charge of EDF Energy's new nuclear project in the UK)
  - Energy Sourcing and Customer Supply** (running conventional power stations and wind farms, and managing customer needs)
- **UK market:**
  - Environment marked by strong Government drive to decarbonise the economy (-80% CO<sub>2</sub> emissions by 2050) and electricity supply, while ensuring security of supply and affordability
  - Highly competitive B2C and B2B markets with unregulated, volatile prices and dual-fuel offerings playing a major role in B2C
  - Gas and coal currently playing the largest roles in electricity generation
  - Need for new generation capacity to come online at around the turn of the decade as significant amount of aging and environmentally restricted capacity is retired
  - Implementation of the Electricity Market Reform ongoing, with the objective of promoting investments in low-carbon generation (carbon price support brought into law, to be implemented from Apr 2013; draft Energy Bill, published 22 May, confirmed introduction of contracts for difference, a capacity mechanism and emission performance standard)

## Market position (2011)



## Key figures (2011)

	MW	TWh
Nuclear	8,756	55.8
Gas	82	0.2
Coal	4,020	16.3
Renewables	98	0.4
<b>Total</b>	<b>12,956</b>	<b>72.5</b>

€bn	
EBITDA (2011) adjusted	1.9

# Strategy for EDF Group in the UK

- Major nuclear operator in the UK, leading the way in nuclear new build
  - Almost 9 GW of existing nuclear capacity with a clear aim of life extension (an average of 7 years for AGRs and 20 years for Sizewell B – a PWR)
  - Aim to build up to 4 EPRs\* at Hinkley Point and Sizewell
  - Key role in discussions on the Electricity Market Reform
- Considerable investments in wind projects
  - Onshore: on target to have ~500MW of capacity in operation by mid 2013; to be further increased in the future
  - Offshore: 1<sup>st</sup> project (Teesside, 62MW) to be completed at year end; JV with Eneco for Navitus Bay project (900-1,200MW)
- Profitable growth downstream
  - Focus on sustainable margins in both B2B and B2C
  - Organic growth strategy in B2C to achieve economies of scale
  - Focus on re-gaining customer trust through fair value, better service and simplicity
  - Development of innovative energy and non-energy products (energy services)
  - Systems transformation to deliver cost savings and improved service
- Group synergies and transformation at the heart of EDF business model
  - Delivering integration synergies from the acquisition of British Energy
  - Major change programs being realised



# Italy - country profile

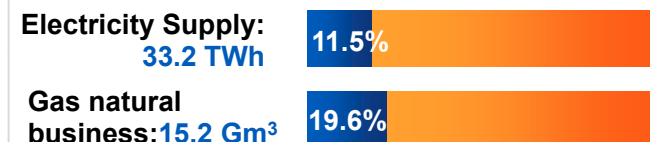
## Key points

- **Main entities: Edison and Fenice<sup>(1)</sup>**
  - 50% of voting rights and 48.96% of economic interests in Edison, as at 31 December 2011
  - 100% of Fenice
- **Key points – Edison<sup>(2)</sup>:**
  - Italy's second largest electric utility, including a 50% share in Edipower
  - Italy's second largest gas utility
  - Edison is a very active player in the hydrocarbons sector, both in Italy and abroad
- **Key points - Fenice:**
  - Supplying energy and environmental services, expert in energy efficiency to industrial customers (Fiat as the main client)
  - Efficient building of new co-generation facilities (combined generation of electricity and heat) or trigeneration (combined generation of electricity, heat and cold)
- **The Italian market is the 4<sup>th</sup> largest European market in electricity, driven by gas**
  - Access to LNG terminal (Rovigo) and pipelines, (ITGI/Galsi), complementary to those in which EDF has a participation (South Stream, Dunkirk)
  - Potential for becoming a gas hub in Europe, and for securing the supplying of gas
  - Position of Italian market is strategic for the development in the Mediterranean area

<sup>(1)</sup>Dalkia and EDF EN are also active in the Italian market

<sup>(2)</sup>For more information on the Edison deal, please see the Appendices section

## Market position of Edison (2011)



## Key figures (2011)

Installed Power <sup>(3)</sup>		
Edison <sup>(4)</sup>	Thermoelectric plants (o/w 9.5 of gas)	9.4 GW
	Hydroelectric plants	1.7 GW
	Wind Power	0.4 GW
Fenice	Electricity generation capacities	0.5 GW
	Heat generation capacities	3.3 GWth

millions of Euros	Dec. 2011	Dec. 2010
EBITDA Edison (EDF part)	480	692
EBITDA Fenice	112	110

<sup>(3)</sup>Consolidated capacities for 100% of Edison in Italy

<sup>(4)</sup>Edison installed capacity includes 50% of Edipower

## Strategy for EDF Group in Italy

- **Benefit from the long experience of Edison along the entire gas value chain, from Exploration & Production to direct sale**
  - Large experience in infrastructure projects (i.e. Rovigo offshore regasification terminal)
  - Actively managed portfolio of concessions and exploration permits (Italy, Norway and Egypt)
- **Promote upstream-downstream balance**
  - Larger electricity sales to residential and SME customers
  - Larger gas sales to large industrial customers
  - Power generation assets optimization and management
- **Reorganization and reinforcement of energy efficiency activities through Fenice**
  - Extension of activities in Spain, Poland and Russia
  - Support of strategic partnerships for the EDF Group

# Benelux - zone profile

## Key points

- A strategic area for EDF:
  - Region that includes important interconnections with the French/German power markets
  - Key in the European natural gas market due to its many facilities for import and transit, and the hub of Zeebrugge
- Main entities: EDF Belgium and EDF Luminus (former SPE); Sloe Centrale B.V (Netherlands)
  - EDF Belgium
    - 100% EDF owned
    - 50% of the Tihange 1 nuclear power (481 MW)
  - EDF Luminus
    - EDF majority stakeholder (63.5%)
    - 13% of Belgian installed capacity
    - Installed wind power capacity: 106.8 MW
  - Sloe Centrale B.V
    - CCGT: 2 units of 435 MW
    - 50% partnership with Delta B.V

## Assets

Country	Company	Main activities	Technical data
Belgium	EDF Belgium	Electricity generation	Installed capacity: <b>481 MW</b>
Belgium	EDF Luminus	Electricity generation Electricity & gas sales	Installed capacity: <b>1,900.6 MW</b> o/w Nuclear <sup>(1)</sup> : 418.5 MW o/w Thermoelectric: 1,302.7 MW o/w Hydro: 72.6 MW o/w Renewables: 106.8 MW Delivery points: <b>approx. 1,69 M</b>
The Netherlands	Sloe Centrale B.V.	Electricity generation	Installed capacity: <b>870 MW</b>

**Cumulated EBITDA 2011 (EDF Belgium + EDF Luminus + Sloe): €334M**

# North America – activities' profile

## North American activities -Generation

- **Generation<sup>(1)</sup>, excl. renewables**
  - EDF Inc - almost 2 GW of nuclear through 49.99% stake in CENG
  - EDF Trading North America - contractual management of 20 GW of generation
- **Renewables**
  - enXco: 1,327 MW of wind, solar and biogas generation
  - EDF EN Canada: 71 MW solar
  - EDF EN Mexico: 68 MW of wind
- **Project development**
  - Unistar: New Nuclear Build, project Calvert Cliff 3
  - enXco: 5 GW of wind and solar developed for own account and for third-party
  - EDF EN Canada: 1 GW of wind and solar
  - EDF EN Mexico: 324 MW of wind under development
- **Operation and Maintenance**
  - enXco Service Corp (US): 5 GW wind & solar of which 3.8 GW is for third-party making eSC the largest third-party provider in North America
  - enXco Service Canada Corp: 224.5 MW wind and solar
  - enXco Servicios Mexico: 67.5 MW wind

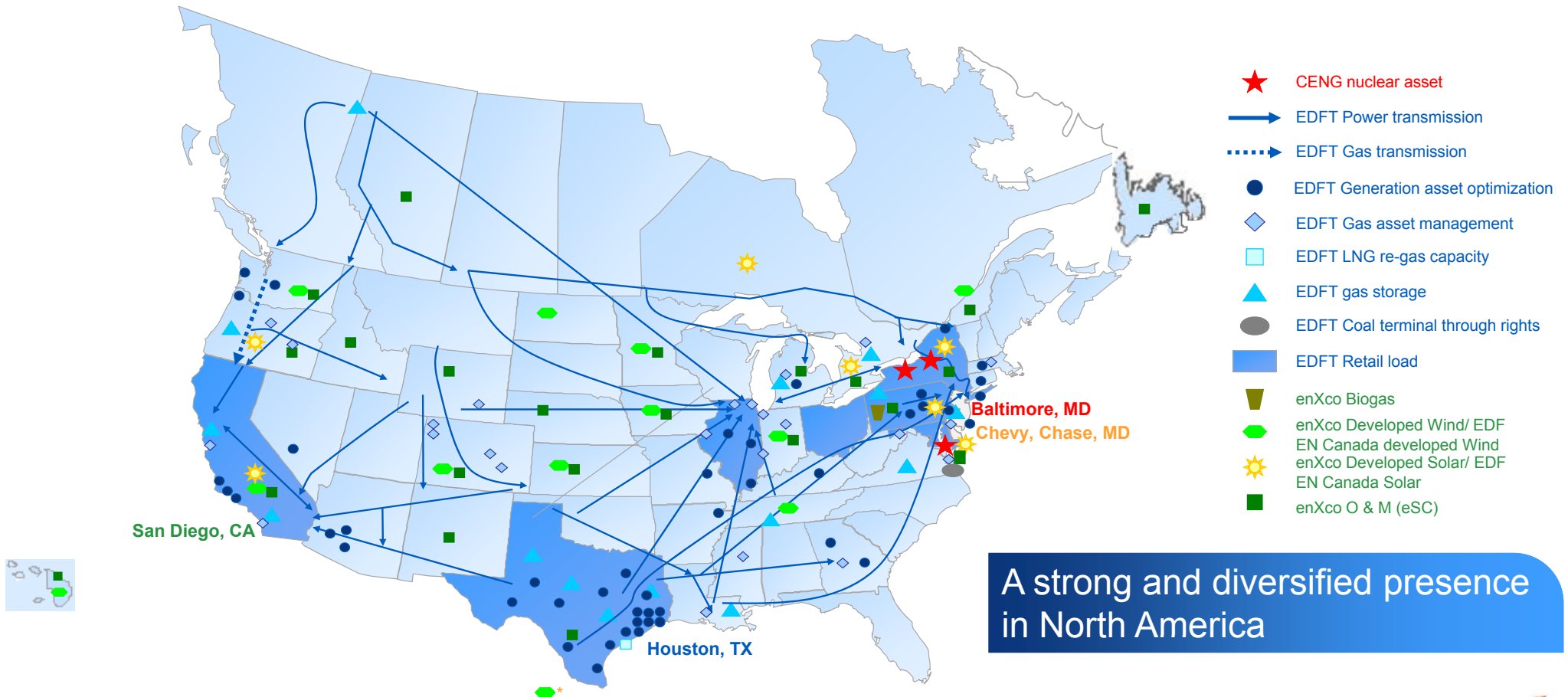
## North American activities - Gas

- **Gas storage:** 1.2 bcm storage capacity rights in 14 separate sites in the US
- **Gas transmission:** 8 bcm/yr. pipeline capacity rights across North America
- **LNG regas.** 1 bcm/yr. regas capacity at Freeport LNG terminal, Texas (contractual)

## North American activities - Other

- **Coal:** long-term rail, barge and terminal throughput rights (East Coast and Gulf)
- **Wholesale load:** 800 MW in power load auctions
- **Retail load:** equity investment (25%) in top rated retail aggregator (Champion). A total of 5 GW peak power retail load across 7 states
- **Environmental commodities:** active trader of RECs<sup>(2)</sup>, biogas, weather derivatives and emissions

# Map of EDF Group North American operations (excl. Mexico): EDF Inc, CENG, EDF Trading North America, EDF EN Canada and enXco



Wind, solar and O&M projects in United States are under enXco; Mexico and Canada are under EDF Energies Nouvelles brand  
The map does not show Mexican operations.

# North America: market characteristics

## US Market Outlook/Strategy

- The United States is the largest energy market in the world and has a highly fragmented industry structure
- Power prices are low due to low gas prices from recently developed shale gas production and reduced energy demand as a result of the economic recession
- Growing policy uncertainty with PTC<sup>(1)</sup> expiration at the end of 2012 is leading to a significant near-term shift in new wind additions
- Environmental regulations
  - 29 States and the District of Columbia have a Renewable Electricity Standard, requiring a percentage of an electric provider's energy sales or installed capacity to come from renewable sources
  - Within the next two years, the US Environmental Protection Agency (EPA) is expected to release final versions of major rules addressing emissions of ozone, particulate matters, mercury, coal ash, as well as environmental impacts of cooling water intake structures
  - EPA regulations covering SOx\* and NOx\* expected to start in January 2012 are being delayed by litigation
  - With respects to carbon emissions, there is currently insufficient momentum in the US to support the implementation of emission reduction policies (except maybe in California, which is expected to start carbon market in January 2013)

## Canadian Market Outlook/Strategy

- The market is robust but limited. Only Ontario and Alberta have opened electricity markets. British Columbia is likely the next large market to open
- Growth is driven by Provincial carbon / renewable policies, but also tar sands developments in Alberta (the largest growing power market in Canada)
- Ontario and Quebec are the largest renewable energy markets. Ontario policies in favor of solar and wind energy were solidified in 2011 with the re-election of the Liberal Party during provincial elections

## Mexican Market Outlook/Strategy

- High electricity price for commercial and industrial customers combined with favorable banking makes wind competitive without subsidies
- Federal Government set goal of 7.5% of energy generation to be sourced from renewables by 2017
- As 2011, 2012 is expected to represent a big growth year for wind development in Mexico, as several major projects in the Oaxaca region were commissioned
- Recent award of circa 1.5GW of capacity in Oaxaca, and tenders in Baja California and Tamaulipas are ongoing

# Central and Eastern Europe – zone profile

## Key points

- Three main countries: Poland, Hungary and Slovakia
- Poland
  - 4 subsidiaries: ERSA, EC Wybrzeze, EC Krakow, Kogeneracja (49% of the shares)
  - Electricity generation, cogeneration
  - According to PSE Operator (Transmission operator in Poland), electricity consumption expected to grow at a CAGR > 2% over the next ten years
  - Important investments are expected because the Polish plants are amongst the oldest in Europe. This need for capacity should lead to an important increase of the clean dark spreads\*
- Hungary
  - 2 main subsidiaries: BE ZRt and DEMASZ ZRt
  - Cogeneration, distribution
- Slovakia
  - 49% holding in Stredoslovenska Energetika (SSE), a distribution SSE with 718,000 customers at end of 2011

## Assets

Country	Company	Main activities	Technical data
Poland	EC Wybrzeze	Electricity and heat generation	<b>Electrical capacity: 323 MW</b> <b>Thermal capacity: 1,217 MWth</b>
Poland	Elektrownia Rybnik S.A. (ERSA)	Electricity generation	<b>Electrical capacity: 1,775 MW</b>
Poland	EC Krakow	Electricity and heat generation	<b>Electrical capacity: 460 MW</b> <b>Thermal capacity: 1,118 MWth</b>
Poland	Kogeneracja	Electricity and heat generation	<b>Electrical capacity: 363 MW</b> <b>Thermal capacity: 1,124 MWth</b>
Poland	Zielona Gora	Electricity and heat generation	<b>Electrical capacity: 221 MW</b> <b>Thermal capacity: 296 MWth</b>
Hungary	BE ZRt	Electricity and heat generation	<b>Electrical capacity: 356 MW</b> <b>Thermal capacity: 1,296 MWth</b>
Hungary	EDF DÉMÁSZ ZRt	Electricity distribution & sales	<b>Customers: approx. 775 000</b> <b>Sales: 5.0 TWh</b>
Slovakia	Groupe SSE	Electricity distribution & sales	<b>customers: approx. 718,000</b> <b>Sales: 4.9 TWh</b>

**2011 EBITDA Central and Eastern Europe: €458 M**



# EDF in Poland: a significant position in a strong growing market

- **Installed capacity 2011:**  
~3140 Mwe and ~4,000 MWth
- **EBITDA 2011:** €276M
- **Employees:** ~3,500

- Heat and/or electricity generation companies
- Trading (electricity, fuels)
- EDF Group representation in Poland

- In December 2011, EDF announced a **€1.8bn investment at Rybnik** for replacing 4 existing units into a supercritical 900 MW unit. The commissioning is planned for 2018
- This project in Rybnik forms part of EDF's ambition both in terms of mix diversification and international expansion



# China

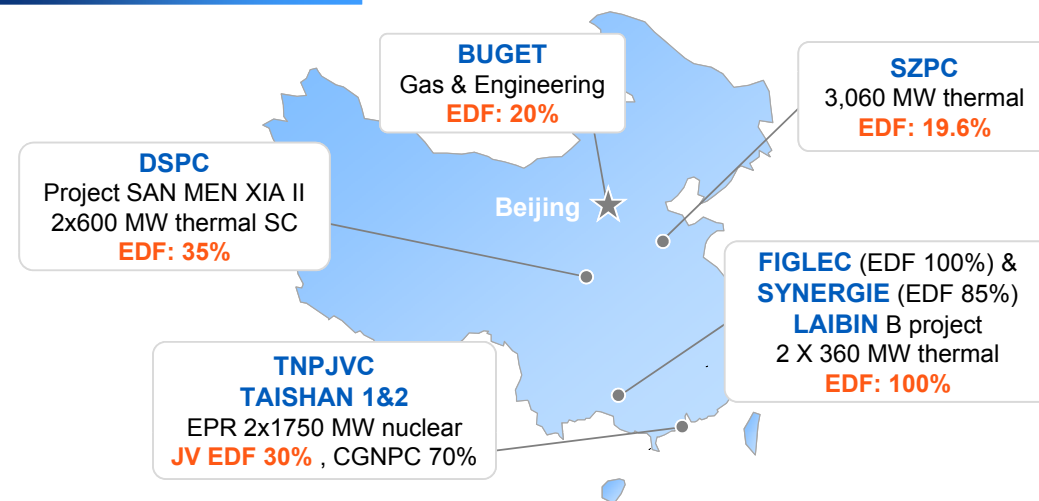
## Key points

- EDF Group is the largest foreign investor in the Chinese electricity sector
- EDF has signed partnerships for developing all energies, and especially nuclear power, coal-fired facilities, and gas
- First foreign company to invest in a Chinese nuclear power project (TNPJVC, 2009): EDF will jointly operate with CGNPC Taishan 1&2 EPR nuclear reactors (2x1,750 MW) (unit 1 to be commissioned in 2014, unit 2 about one year after)
- Stakes in companies operating coal-fired power plants with a total installed capacity of 4,980 MW: Guangxi (Laibin B), Shandong (SZPC), Henan (DSPC)
- Involved in gas engineering in Beijing through its partnership in Buget

2011 EBITDA: €93 M

4,980 MW of installed capacity in China

## Map of operations



## Assets

Country	Company name (stake)	Asset name	Installed capacity
China	SZPC (19.6%)	3 coal-fired power plants	3,060MW
China	DSPC (35%)	San Men Xia 2 (coal)	2x600MW
China	Figlec (100%)	Laibin B power plant (coal)	2x360MW

# Year 2011

# Facts & Figures



## EDF main businesses



The EDF Group

**EDF main businesses**

EDF within the energy sector  
and derived strategy

Financials

Market data

Appendices

## EDF main businesses

Generation

Networks - Transmission & Distribution

Optimization - Trading - Supply (Focus on France)

Gas



## EDF main businesses

### Generation

Nuclear

Hydropower & renewables

Conventional plants



## EDF main businesses

### Generation

#### Nuclear

Key points Nuclear

Existing Nuclear France

Existing Nuclear UK

Safety

New Nuclear Build

Long term provisions



## Nuclear: a unique expertise

- EDF: The world's leading nuclear power plant operator, with 1,500 reactor years of experience
- Generating energy at competitive cost, not influenced by fossil fuel prices, with no CO<sub>2</sub> emissions
- Positions in France, the UK, the US and China
- EDF is building new reactors
  - The new EPR\* will use 22% less fuel than PWRs currently in use
  - One EPR unit being built in France, two in China and projects under study in the UK

Did you know?

**EDF**  
existing fleet

**58** reactors in France,  
**15** reactors in the UK,  
**5** reactors in the US

Did you know?

**New nuclear**  
development

**3** EPR reactors  
**being built**  
(1 in France and 2 in China)

Did you know?

**A strong**  
experience

**1,500** reactor-years  
of experience operating  
**the French fleet**

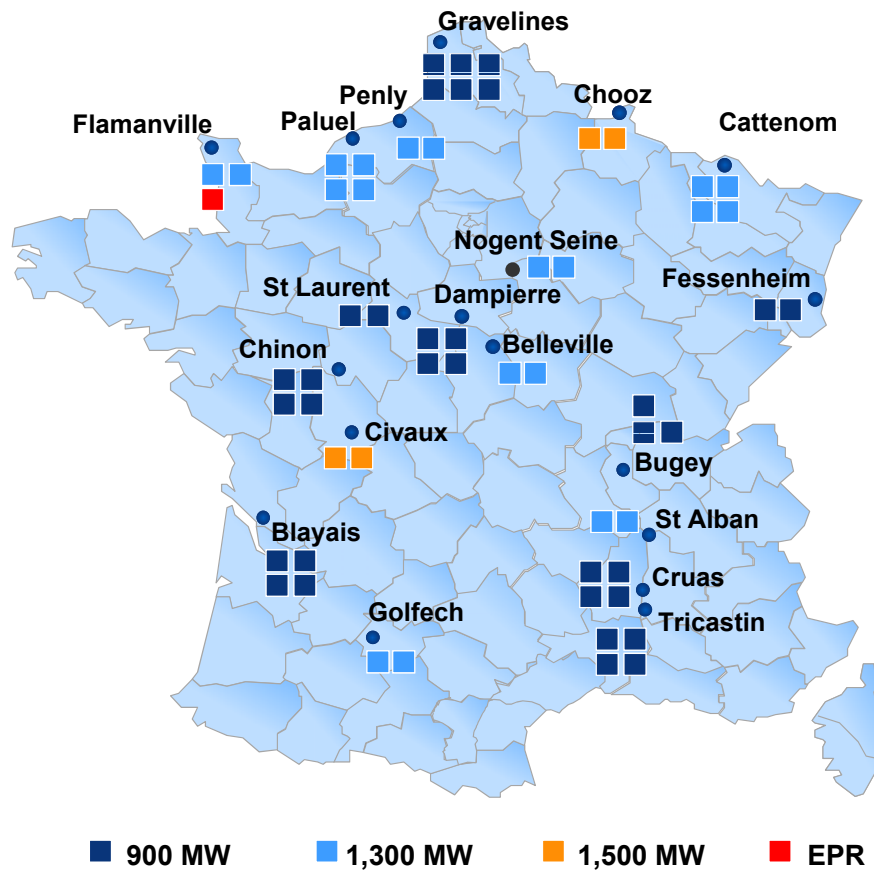


## A regulatory environment supportive of nuclear energy in both EDF main markets

- In France: NOME Law secures long-term visibility on French generation/supply cash flows
  - ARENH\* promotes competitors' access to base load power produced by EDF nuclear power according to their final customers consumption (max. 100 TWh to be sold by EDF)
  - The price of €42/MWh set on 1 January 2012 is in line with EDF's claim and should gradually increase to reach the current economic cost of the existing nuclear fleet
  - An indexation formula should be enacted by the government, the timing being still uncertain
  - 2015 target (at the latest) for bringing energy component of tariffs in line with ARENH
  - Introduction of a market mechanism to ensure reliability of supply through appropriate incentives to build capacity
- In the UK: Energy Market Reform (EMR) provides security of cash-flows for New Nuclear Build
  - Carbon floor announced 31 March 2011 two weeks after Fukushima (with a 2020 target of £30/t 2009 price; or at least £40/t with conservative assumption on UK inflation)
  - A capacity mechanism is also planned to ensure security of supply, as well as a CfD mechanism (Contract for Difference) to address risk and volatility in the market, providing certainty for customers and investors and so driving the efficient deployment of capital
  - On 19 July 2011, the British Parliament confirmed the need to develop nuclear energy in the UK, marking a milestone for EDF in its plans for the UK



# EDF French nuclear fleet



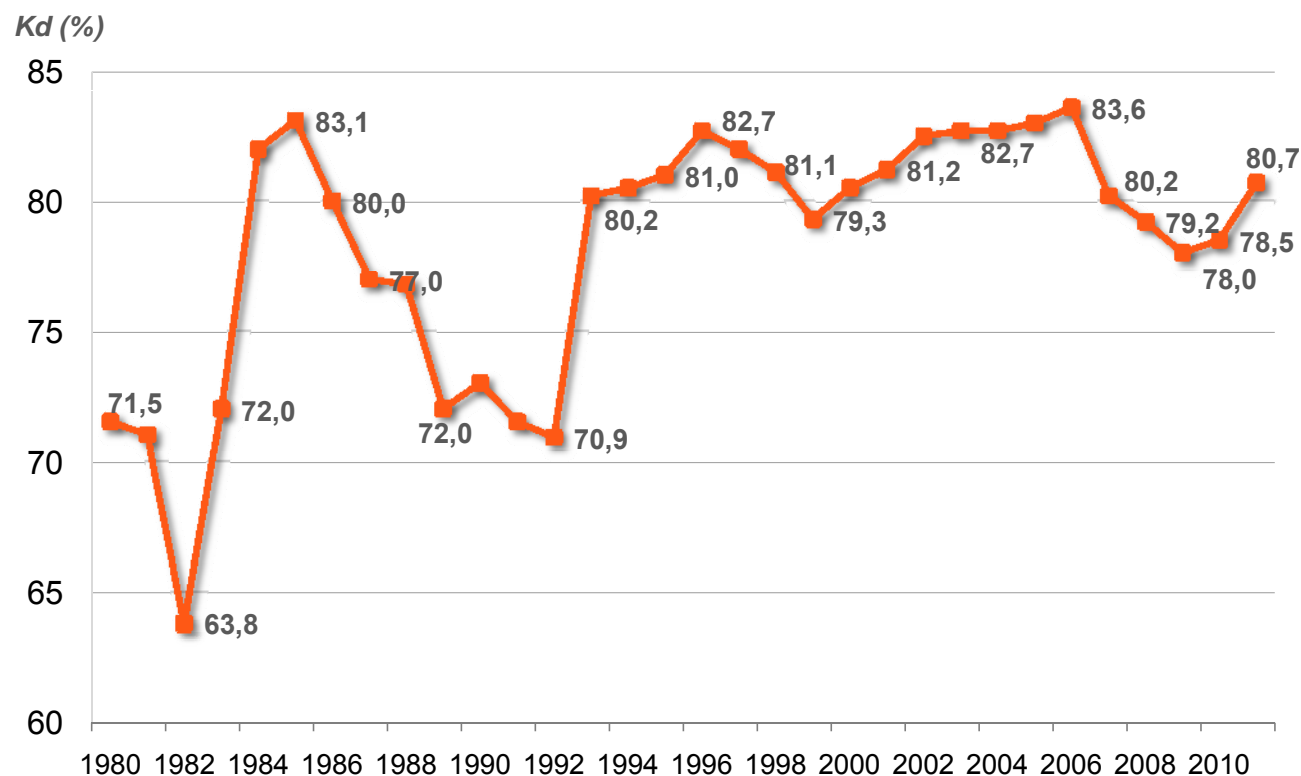
- 77.7%<sup>(1)</sup> of French power generation in 2011
- 58 reactors running
- 19 sites
- 3 series of the same PWR technology:
  - 900 MW 34 reactors 31 GW
  - 1,300 MW 20 reactors 26 GW
  - 1,450 MW 4 reactors 6 GW

## Did you know?

The whole fleet of **EDF reactors** currently operated has been built using the same technology (PWR). This uniformization allows for operational synergies and greater efficiency. Moreover, **more than being just a nuclear operator, EDF is an architect-assembler**, meaning that EDF is responsible for the design, schedule and building of the reactors, which can only benefit EDF with respect to the safe operating of the fleet

<sup>(1)</sup> source: RTE

## Availability of French nuclear fleet since 1980



### Did you know?

The **Kd**, or availability factor, represents the available energy as a percentage of the maximum energy that could be generated if the installed capacity were operated year-round

The **Ku**, or utilization factor, is the energy generated as a percent of energy available and reflects environmental and social constraints, supply of system services and optimization

The multiplication of the Kd and the Ku leads to the **Kp**, or load factor, defined as the generated energy compared to the maximum theoretical energy

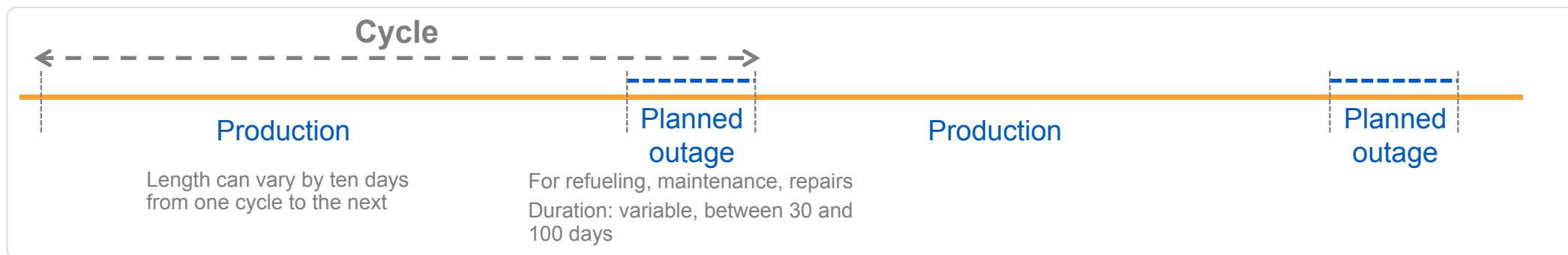
$$Kp = Kd \times Ku$$

## Key Figures: Nuclear Generation in France

	2006	2007	2008	2009	2010	2011
<b>Output (TWh)</b>	<b>428</b>	<b>418</b>	<b>418</b>	<b>390</b>	<b>408</b>	<b>421</b>
<b>Kp factor (load factor)</b>	<b>77.4%</b>	<b>75.6%</b>	<b>75.3%</b>	<b>70.5%</b>	<b>73.8%</b>	<b>76.1%</b>
Ku factor (utilization factor)	92.6%	94.2%	95.2%	90.4%	94.0%	94.3%
Kd factor (availability factor)	83.6%	80.2%	79.2%	78.0%	78.5%	80.7%
<b>N° of 10-year inspections (10Y insp.)</b>	<b>5</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>5</b>	<b>9</b>



# The French nuclear fleet: operating cycle



## The refueling cycle of nuclear reactors

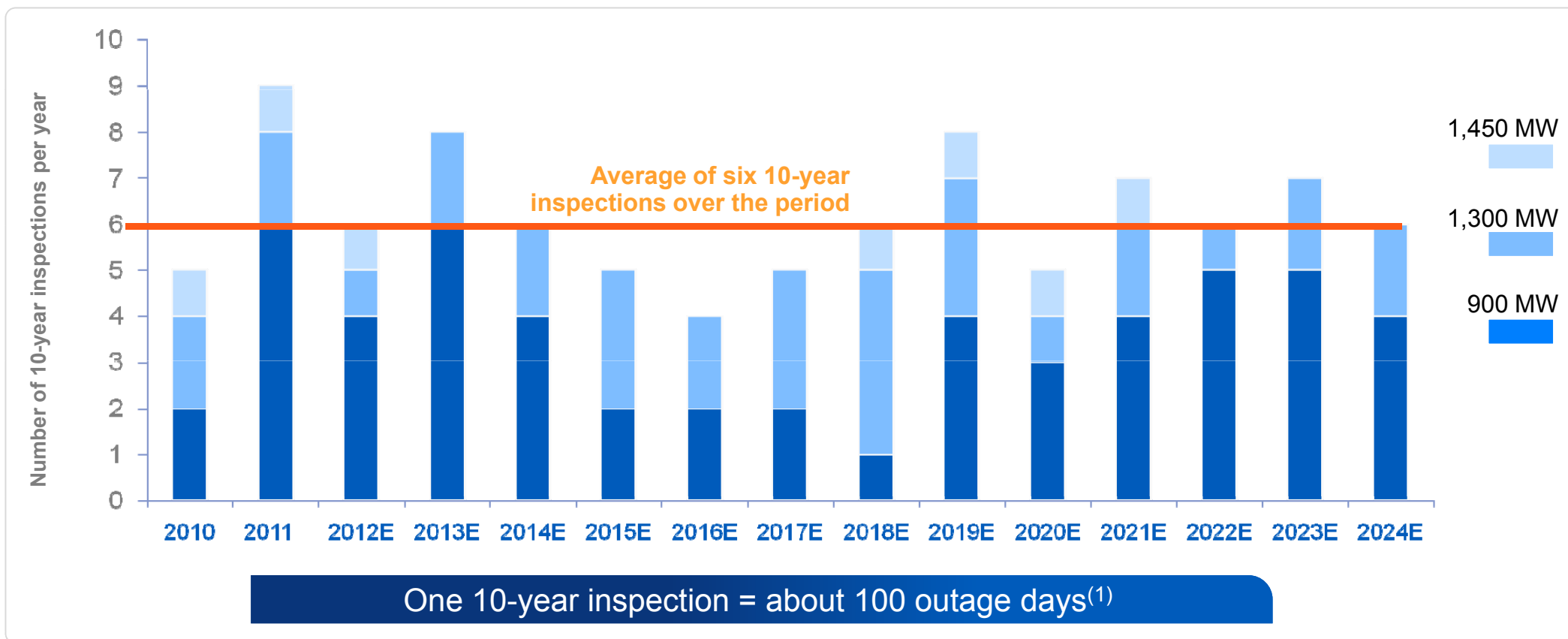
- 900 MW: **28 reactors** in 12-month cycle  
**6 reactors** in 18-month cycle
- 1,300 MW: **20 reactors** in 18-month cycle
- 1,450 MW: **4 reactors** in 18-month cycle

## 3 types of planned outages

- Ordinary shutdown for refueling only (ASR): **Duration of about 35 days**
- Partial inspection for refueling and maintenance (PI): **Duration of about 60 days**, varying according to programs for maintenance work
- 10-year inspections (DV): **Duration of about 100 days**, varying according to programs for safety upgrades and maintenance work
  - Regulatory obligations (safety tests and various controls), adapting safety to latest standards, maintenance work and changes



## Average of six 10-year inspections per year in France

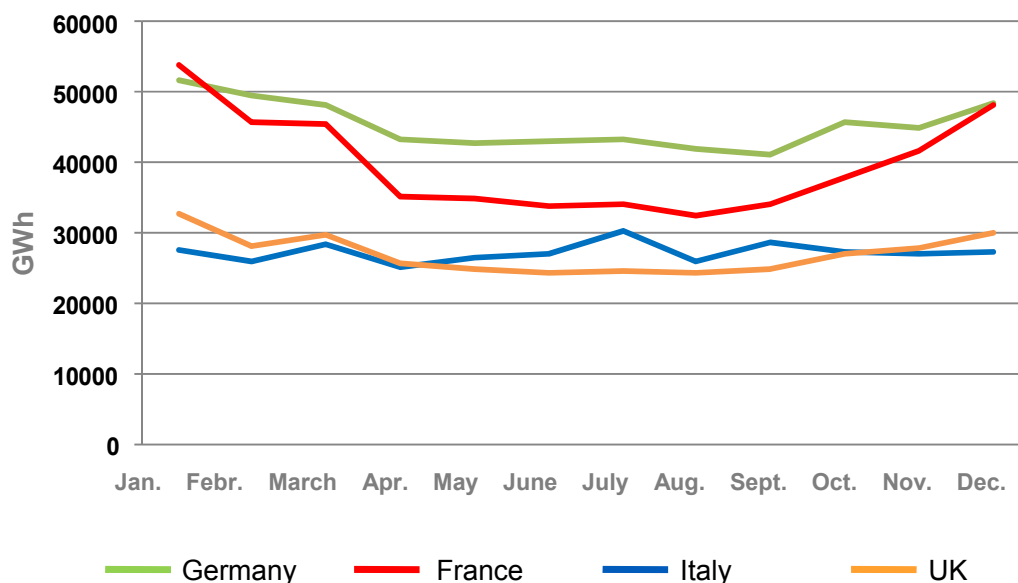


(1) This average duration may vary according to programs for safety upgrades and maintenance work  
 Note: outage days associated with 10-year inspections have different Kd values depending on the capacity of the reactor.

# French consumption pattern is particularly seasonal and thermosensitive

which creates special demand on the nuclear fleet

2011 monthly consumption in main European countries

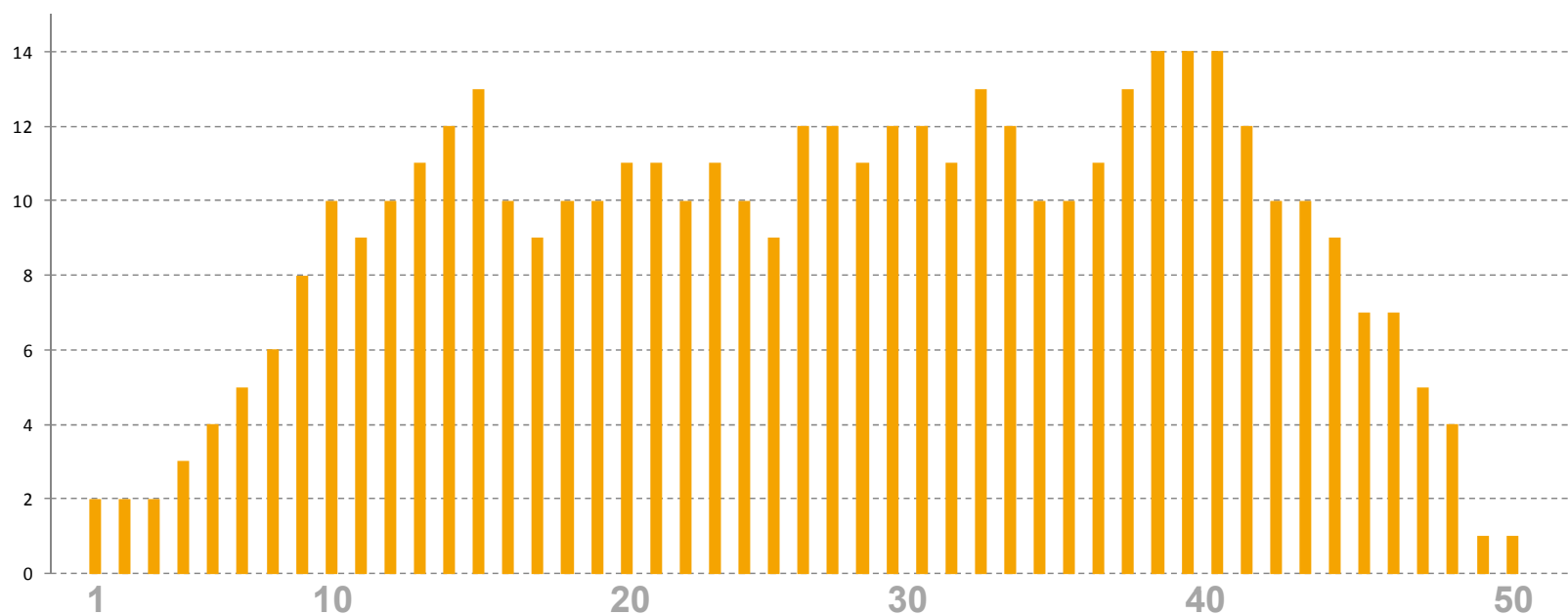


- Consumption pattern with high seasonal variations
  - Between 30 to 35 TWh in summer months
  - Sometimes over 50 TWh in December & January
- France is highly sensitive to temperature changes: 1°C variation in temperature in France:
  - in Winter  $\approx \pm 2,300$  MW
  - in Summer  $\approx \pm 500$  MW

## A seasonal schedule of outages

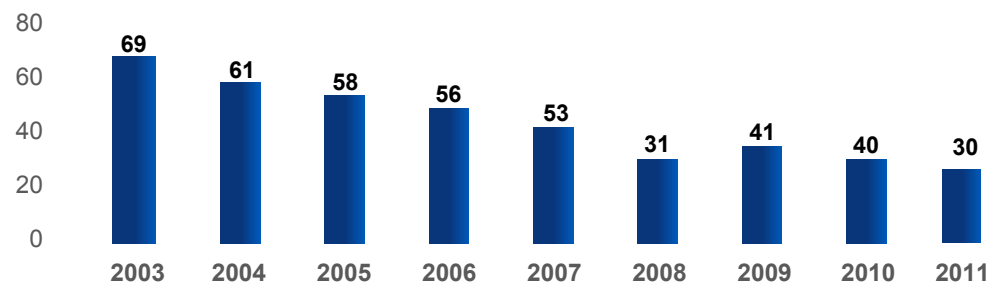
- A minimum number of outages during winter
- Necessary balance between 12-month and 18-month production cycles

Year 2011 / Number of PWR units in planned outage/week



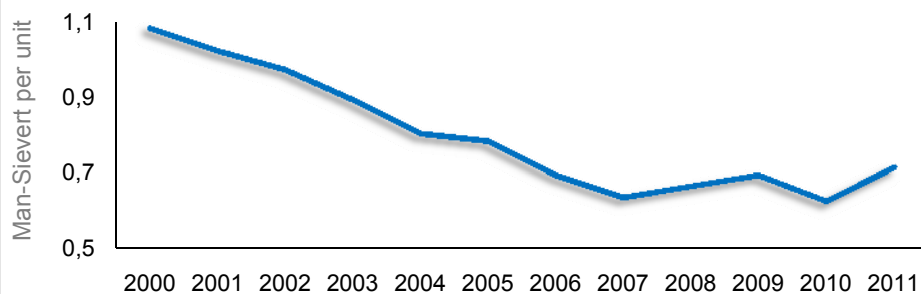
## Continuous improvement in operating conditions

Number of automatic reactor stoppages



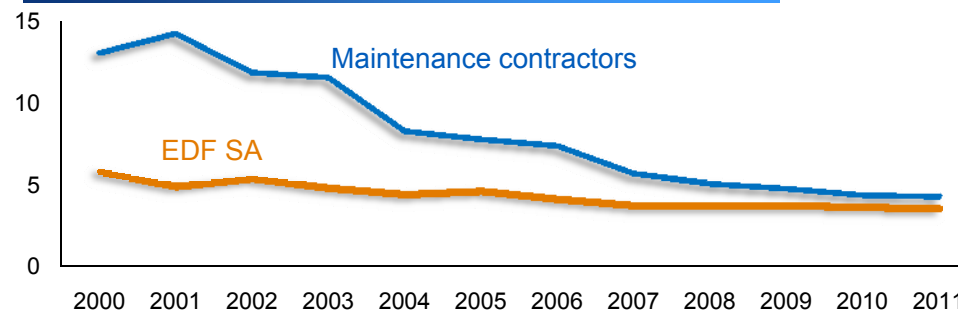
The number of automatic outages is a key indication of safety. It measures the quality and seriousness with which operations are conducted. The results of EDF's fleet have been among the best in the world over the last three years

Average annual collective dose/reactor



The continual application of the « as low as reasonably achievable" strategy has made it possible to gradually reduce the dose/reactor ratio

Accident frequency rate<sup>(1)</sup>

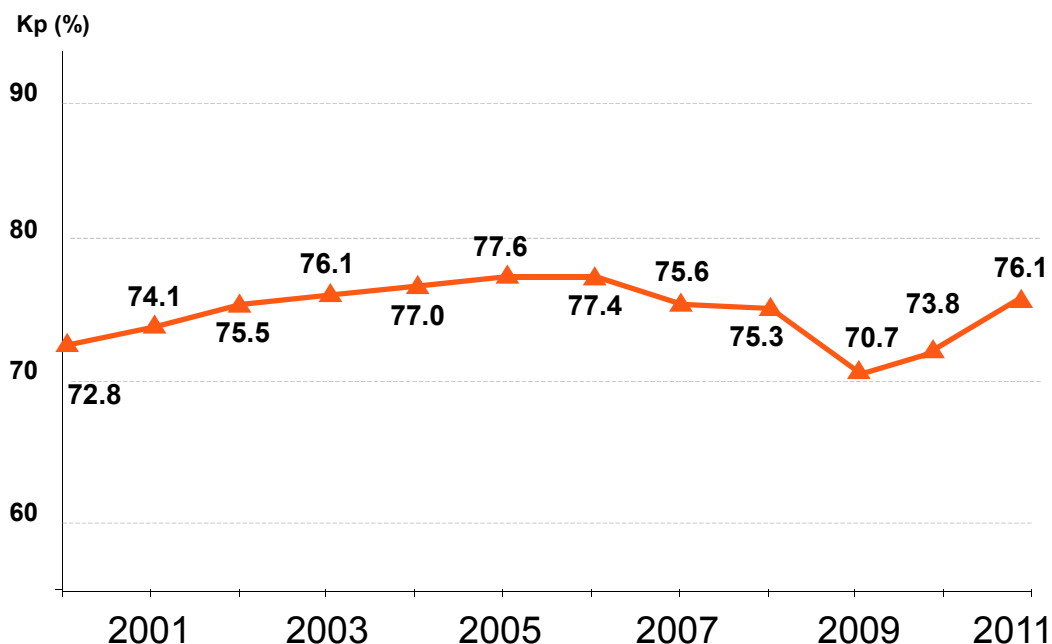


Thanks to initiatives jointly-led by EDF and its suppliers, all employees benefit from the same safety level which is constantly improving

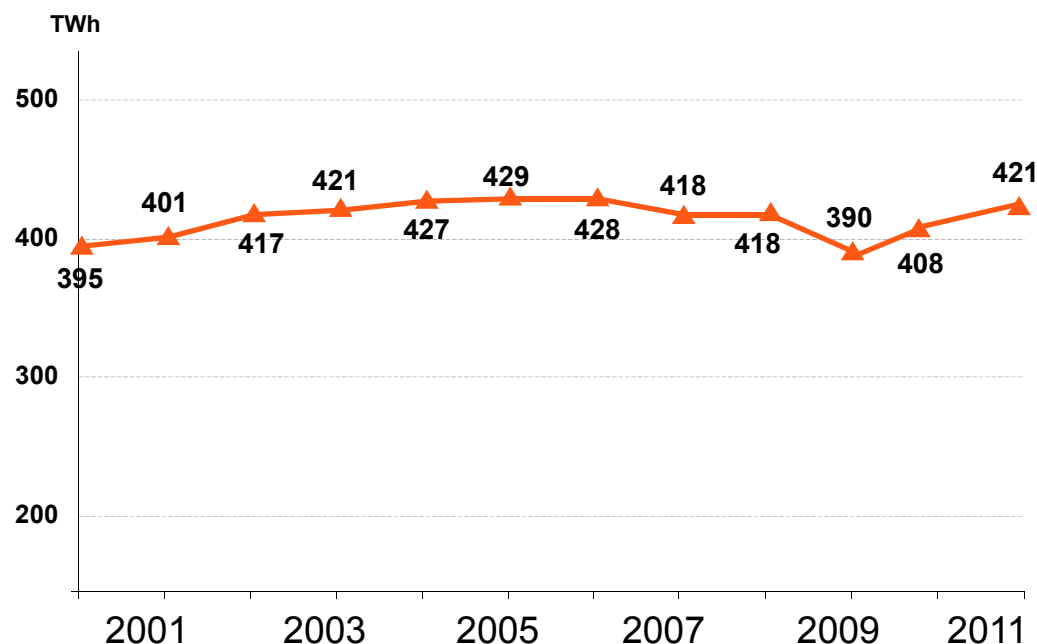


## Operating performance: load factor and nuclear output

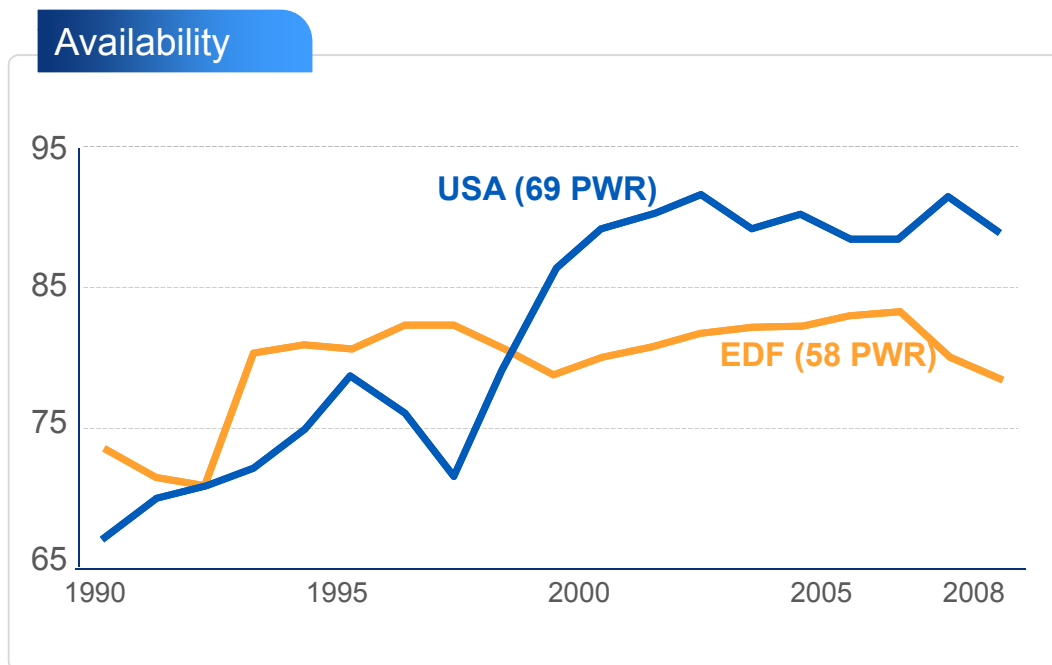
Annual Kp (load factor) of nuclear fleet



Net nuclear output (PWR fleet)



## Operating performance: Kd comparison with PWR US fleet



- Kd includes the impact of technical unavailability (planned and unplanned outages)
  - PWR US fleet operates purely under base-load generation
  - French fleet operates with seasonality of outages
- Key structural discrepancy  $\approx -6$  points
  - $\approx -2$  pts: fuel management method (fuel cycle)
  - $\approx -2$  pts: solicitation method (load monitoring in France)
  - $\approx -2$  pts: regulation and safety specificities

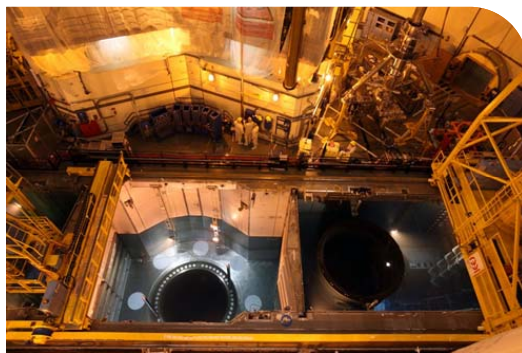
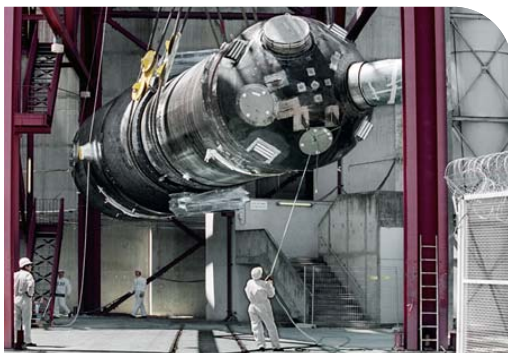


## Operating performance: the drivers

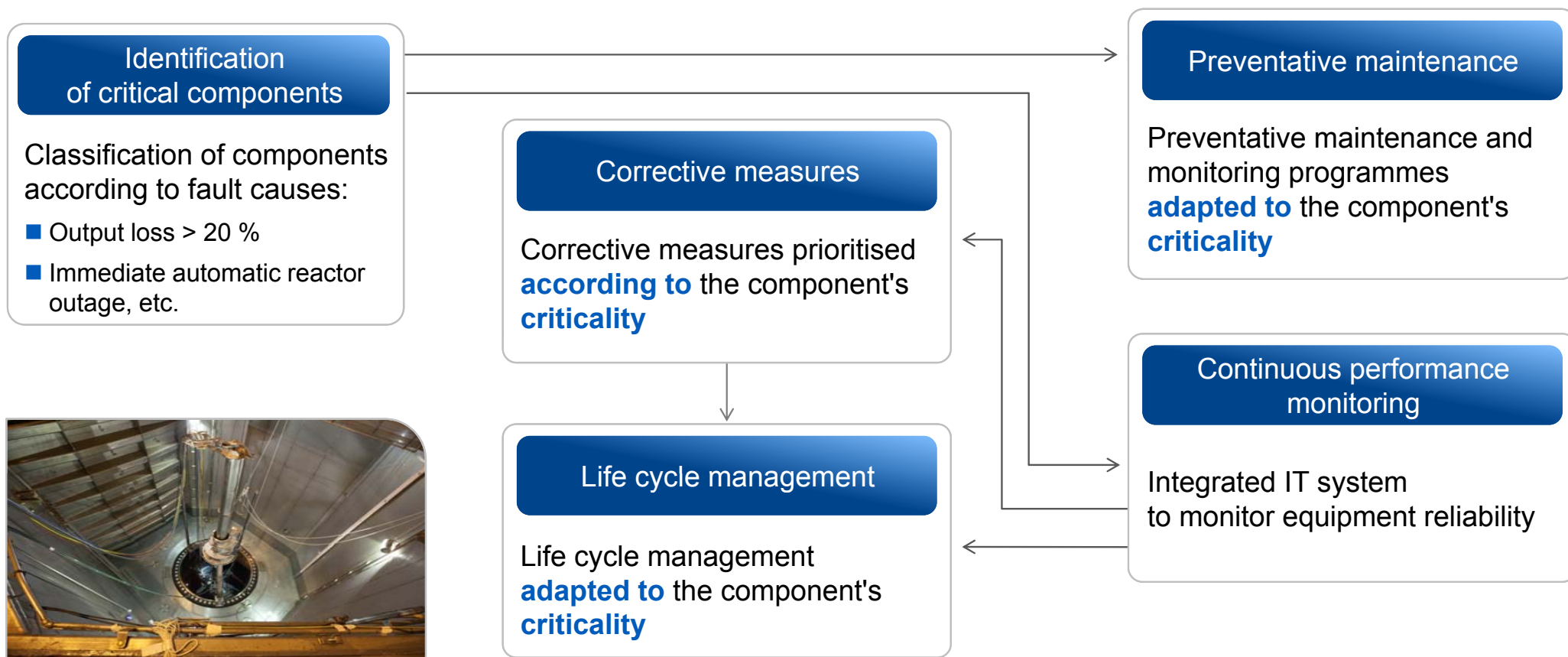
- Pursuing replacement of large components (steam generators, alternators' stators, main transformers)
- Reinforcing industrial management of planned outages to reduce outage extensions
- Improving the reliability of equipment through preventative maintenance to reduce unplanned unavailability

## Replacement of large components to continue

	Replaced at end 2011	Priority replacements
<b>Steam generators (3 SG/900MW reactor)</b>	21 900 MW-reactors	5 priority reactors by 2014 of which 2 in 2012
<b>Alternator stators</b>	27 reactors	21 reactors until 2017 of which 4 in 2012
<b>Main transformers (3 units / reactor)</b>	Programme ramped up starting in 2012: 4 reactors/year on average until 2020	



# Reducing the unplanned unavailability rate: the AP 913 approach<sup>(1)</sup>





## Reinforcing the control of unit outages to reduce their extensions

### The Operating Centre for Continuous Management of Unit Outages (COPAT):

- Continuous monitoring of critical outage activities and reactive processing of alerts to secure the outage period
  - Alerting COPAT after 30 minutes
  - Implementation of reactive maintenance teams on a continuous basis and creation of teams identified for the integration of feedback
  - Management process of important hazards



## EDF Energy nuclear fleet



### In a nutshell

- Generated 16% of UK output in 2010
- 15 reactors in operation
- 8 nuclear power stations
- 2 technologies (AGR and PWR), with a total capacity of 8.7 GW

### Did you know?

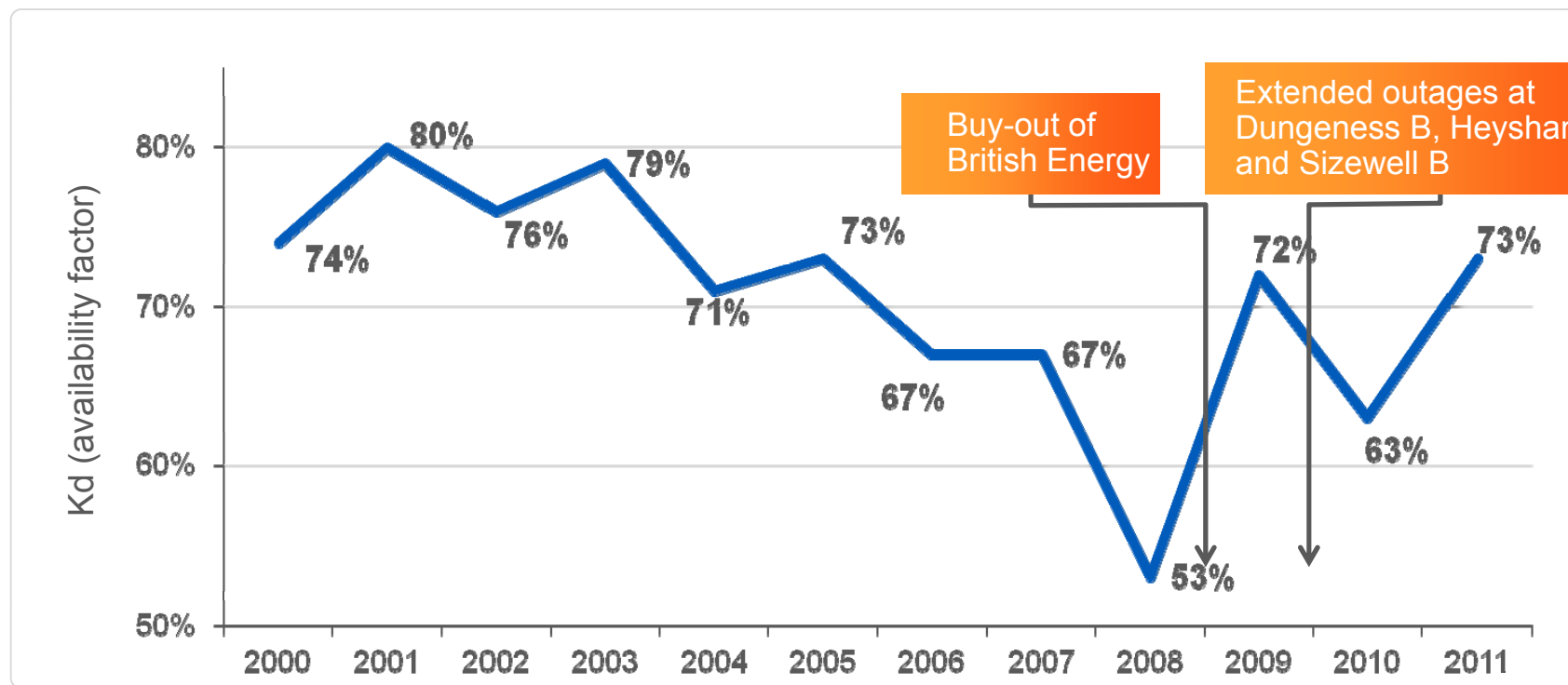
An **AGR** differs in many respects from a PWR. Whereas the AGR design is unique to the UK, the PWR design is the most common reactor type in the world.

An **AGR** has a graphite moderator helping 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 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 coolant and moderator. The fuel used is enriched uranium dioxide and is contained in zirconium alloy tubes.



## Key figures: Nuclear Generation in UK



	2006	2007	2008	2009	2010	2011
Output (TWh)	55,5	51,9	40,2	55,1	48,3	55,8
Kd (%)	67%	67%	53%	72%	63%	73%



## Key points of the EDF Energy nuclear fleet

### ■ A nuclear fleet with an average age of 28 years

- Total power generation of 8.7GW, of which 7 GW were introduced between 1983 and 1995
- Strong improvement of operational performance, with an output target of over 55 TWh per year

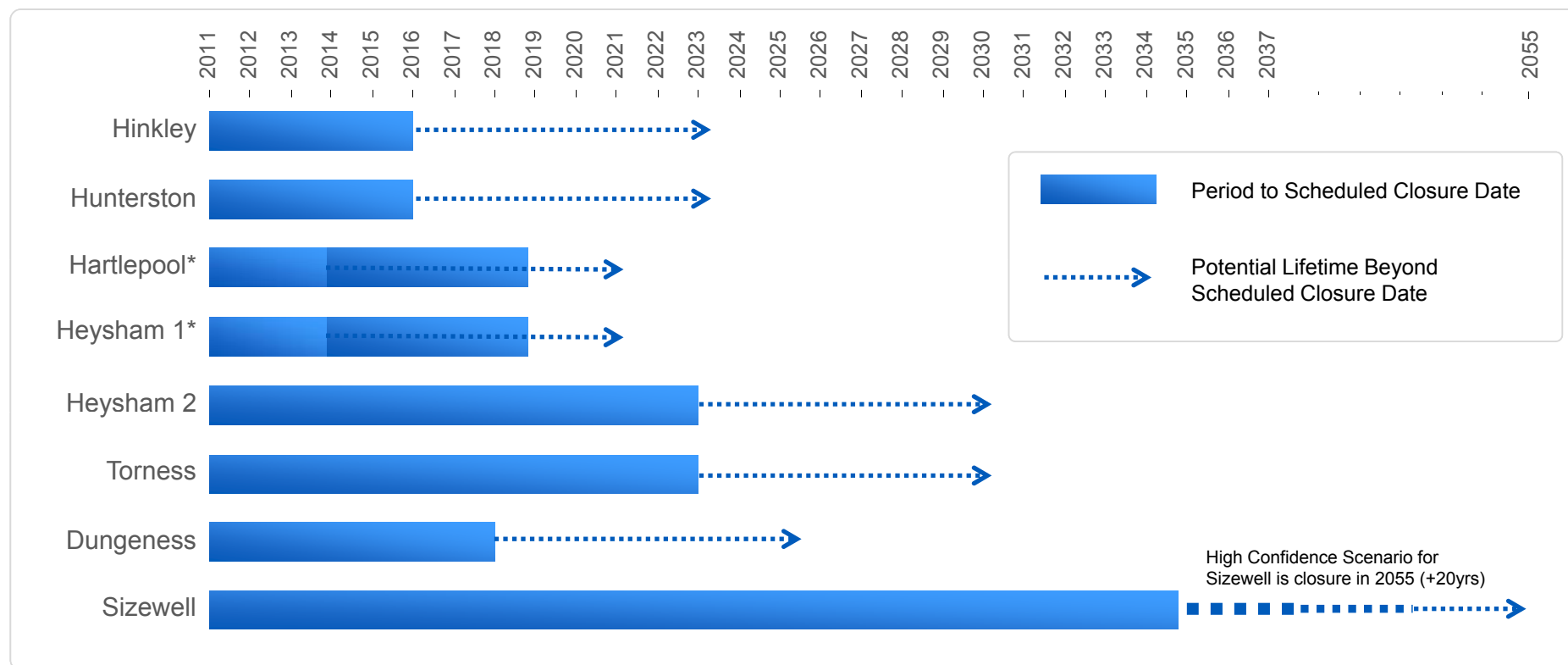
### ■ Safety is our over-riding priority

- Adequacy of each station confirmed at each statutory outage - Office for Nuclear Regulation (ONR1) has to provide consent to restart after each outage
- Periodic safety review (PSR) undertaken every 10 years, also requiring ONR acceptance
- Following events in Japan –
  - EDF Energy has completed evaluations required by WANO, responded to the ONR recommendations and responded to the EU Stress Test
  - No shortfalls in the operational safety cases for our existing stations were identified in the Stress Test examinations – nevertheless, a number of opportunities for resilience enhancements have been identified and additional safety investment to implement these is planned over the next few years

### ■ On track to deliver on life extensions target

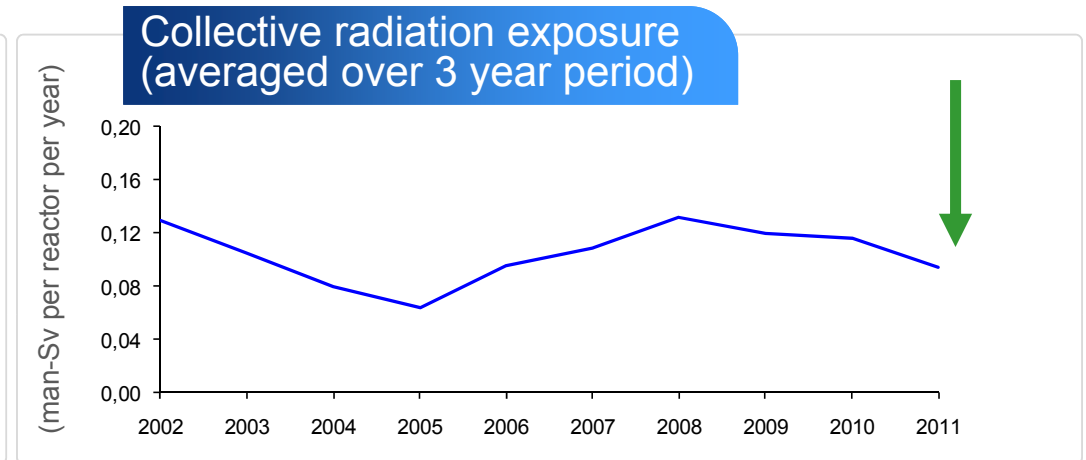
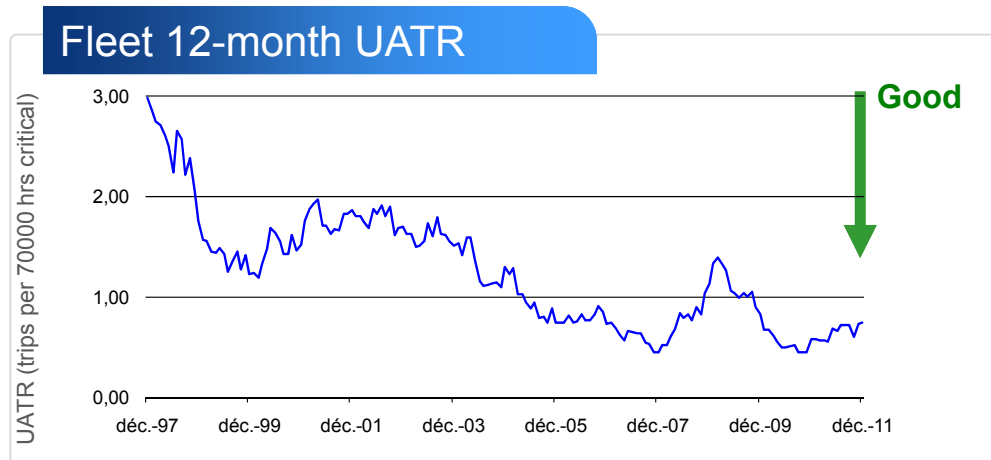
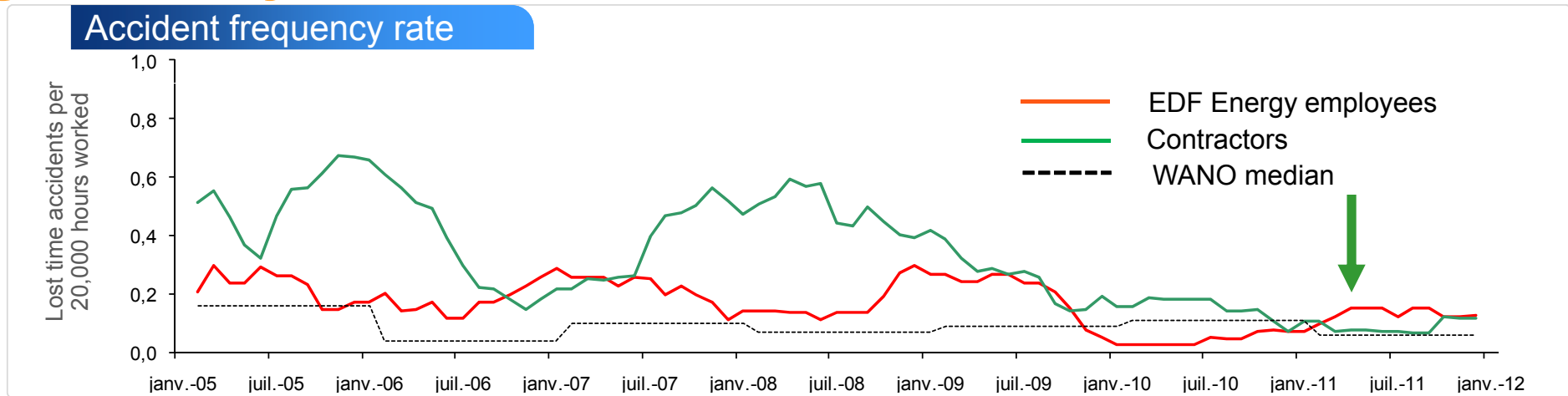
- Life extension subject to review of safety, technical and economic factors
- Target to extend the lives of the AGR by an average of 7 years, and Sizewell B by 20 years
- Expected cost per AGR: as a general guide approximately £10m per 1 year extension at one station
- Life Extension of 5 years for Heysham 1 and Hartlepool confirmed in 2010

## EDF Energy nuclear power station lifetimes



We are now targeting an average of seven years life extensions across the AGR fleet – \*including Heysham 1 and Hartlepool whose five year extensions were announced in December 2010 – and 20 years for Sizewell B (announced in February 2012)

# EDF Energy nuclear safety performance has improved significantly





## EDF Energy Nuclear Generation has a clear plan to maximize performance and long-term value

### Short to medium term

#### ■ Key Objectives

- Excellence in Safety – Safety is over-riding priority
- Achieve sustainable output of >55 TWh per annum; key focus areas identified
- Maintain adequate investments in plant including that necessary to support life extensions and post-Fukushima enhancements
- Maintain and develop skilled workforce to support UK new build program

### Long-term strategic target

#### ■ Ambition: Safe, reliable generation over extended life

- Zero harm
- Seek opportunities to further enhance output sustainably
- Deliver life extensions of an average of 7 years for the AGRs and 20 years for Sizewell B
- Closely aligns with the UKs ambition to achieve secure, affordable and low carbon electricity



## The strengths of EDF's nuclear fleet

### ■ Average age of 26 years

- 44 GW commissioned between 1980 and 1990 out of a total installed capacity of 63 GW
- Technical standardisation and continuous improvement in safety
- EDF: architect-assembler, owner and operator of its plants

### ■ Strict regulatory framework in France: safety assessments every ten years with the aim of strengthening the design of its plants

- A new safety guide and corresponding improvement programme implemented during 10-year evaluations for each technical series, after receiving approval from the ASN
- Systematic re-evaluation of safety standards building on national and international experience as well as scientific and technical developments

### ■ Investment programme for replacing large components after 30 years of operation (2010-2020)

- Obsolescence of some large components that must be replaced after approximately 30 years of operation (international benchmark)
- With a view to operating facilities for 60 years

### ■ Extending operations beyond 40 years

- Target consistent with trends observed around the globe for similar technologies (PWR)
- EDF proposes a re-evaluation of specific safety standards to the ASN for implementation during the 4th 10-year visit for 900 MW plants and the 3rd 10-year visit for 1300 MW plants





## Post-Fukushima's timetable in France

### ■ ASN complementary safety assessment:

- 1 June 2011: methodology report submitted to the ASN
- 15 September 2011: EDF submits reports on 19 nuclear plants (including Flamanville 3) to the ASN
- 8, 9 and 10 November: Permanent Group of experts requested to meet with ASN
- 3 January 2012: ASN gives recommendation to the Prime minister, who will pass it on to the European Commission
- 30 June 2012: EDF submits proposals for material and organisational safety measures in response to extreme situations to the ASN
- 15 September 2012: reports submitted to the ASN regarding facilities that are not as high a priority

### ■ UE stress tests:

- From January to June 2012: reports from all European countries submitted to peer review process
- 25 April 2012: European Nuclear Safety Regulators Group examines and approves report on findings of European peer reviews
- Autumn 2012: European Commission presents its report on stress tests to the European Council





# Post-Fukushima in France

## The ASN's findings

- Nuclear facilities have a sufficient level of safety in current state
  - The current seismic margins of EDF's nuclear reactors are sufficient
  - The overhaul following the flood at the Blayais nuclear plant in 1999 provide nuclear plants with a high level of protection against flood risk
  - The reinforced design of the EPR already safeguards against serious accidents
- Operators have been asked to step up facilities' ability to withstand extreme situations, beyond their current safety margins

The ASN deemed that "safety at the facilities was good enough not to require that they be immediately shut down"





## Post-Fukushima in France

### EDF will implement ASN requirements

- Reinforcing current protection of facilities and certain materials against earthquakes and floods
- Additional technical measures to protect against extreme weather events:
  - Identifying a list of equipment (i.e. "the core") enabling to guarantee the availability of a back-up water and electricity supply for each reactor in extreme weather events and reinforced protection against external events beyond current design (presentation to the ASN by June 2012)
  - Reinforcement of back-up water and electricity supplies (e.g. adding a last-resort emergency diesel generator for each reactor)
- Organisational measures:
  - Reinforcing the local and national emergency response organisation (competences, trainings, resistance of emergency management rooms)
  - Creation of an Emergency Intervention Task Force, fully operational at any site within 24 hours





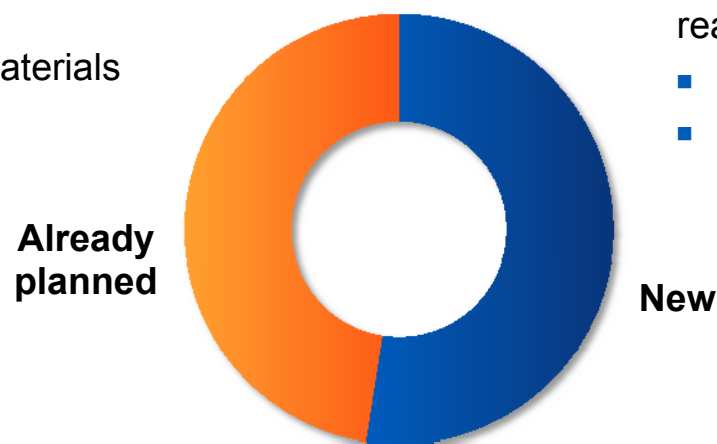
## Additional measures, including some that are already envisioned in our medium-to long-term guidance

**Safety improvements already accounted for in the extension of the operational lifespan of plants, including:**

- Additional resources for electricity and water supplies
- Emergency power removal systems in the event of multiple failures
- Improving filtration of radioactive materials in the event of a serious incident

**New improvements:**

- Increasing protection of sites beyond their design specifications (earthquake, floods)
- “Core” materials that can withstand the severity of this type of earthquake or flood
- Additional crisis resources in the event all reactors at one site are affected:
  - Local resources (crisis centre)
  - National resources (Emergency Intervention Task Force or FARN)



approx. €10bn total<sup>(1)</sup>



# Post-Fukushima in the UK

## Timeline of stress tests

- Information sent to the ONR<sup>(1)</sup> by EDF Energy between 15 April and 31 July 2011
  - ONR's interim report published on 18 May 2011, containing 26 recommendations
  - ONR's final report published on 11 October 2011, containing 12 new recommendations
- EDF Energy submits 8 additional safety reports to the ONR on 31 October 2011
  - The ONR releases its National Report on 4 January 2012 containing 19 observations
  - Some recommendations include observations already issued in the interim and final reports
- The ONR concluded that:

"Neither the reviews undertaken by the Licensees for the stress tests, nor the earlier national reviews has indicated any fundamental weaknesses in the definition of design basis events or the safety systems related to the stress tests to withstand them for UK NPPs"

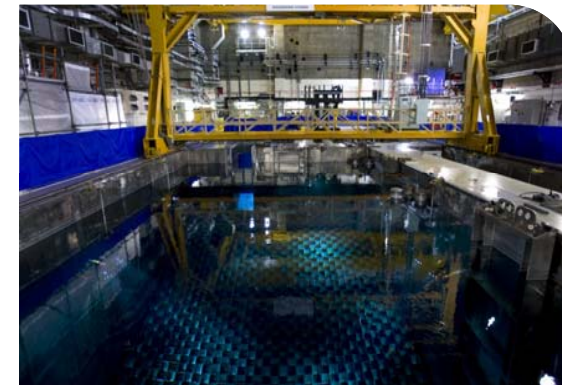




## Post-Fukushima in the UK

### Conclusions of the stress tests:

- For the entire fleet
  - Preparations for emergency plans will be stepped up to reflect a better understanding of the evolution of serious accidents and the availability of emergency equipment
- Sizewell B
  - Capacity to withstand a serious accident could be improved by installing passive hydrogen recombiners and by improving capacity to ventilate the containment building through filters used for serious accidents
  - Technical research on filtering is underway, in line with technical work being carried out in France
  - An emergency and rescue command centre near the site, which would be used for storing the rescue equipment and aiding the site in the event the main systems no longer function
- For the AGR reactors
  - Slower response times of AGR reactors require a different solution
  - Limited number of forthcoming modifications for flood protection
  - Focus on large range of equipment and safeguard buildings kept off site





## Post-Fukushima in the US

- Since the Japanese accident in March 2011, the NRC<sup>(1)</sup> has re-affirmed the safety of reactors in operation in the US
- It has rejected the possibility of a shutdown while there is no new risk
- US reactors have displayed capacity to withstand earthquakes and other external events for which pre-existing measures have been reinforced, including:
  - Significant reinforcement in the 1990s, in the wake of the Individual Plant Examination for External Events
  - Extra lines of defence added post-September 11th





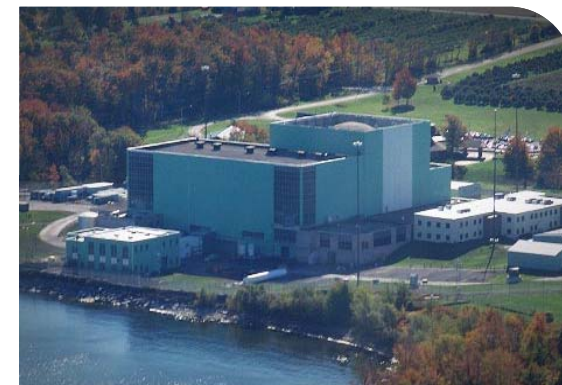


## Post-Fukushima reactions in the US

- Since the accident in Japan in March 2011, the task force put in place by the NRC (Nuclear Regulatory Commission) enacted 12 recommendations and planned together with the industry:

### SHORT TERM

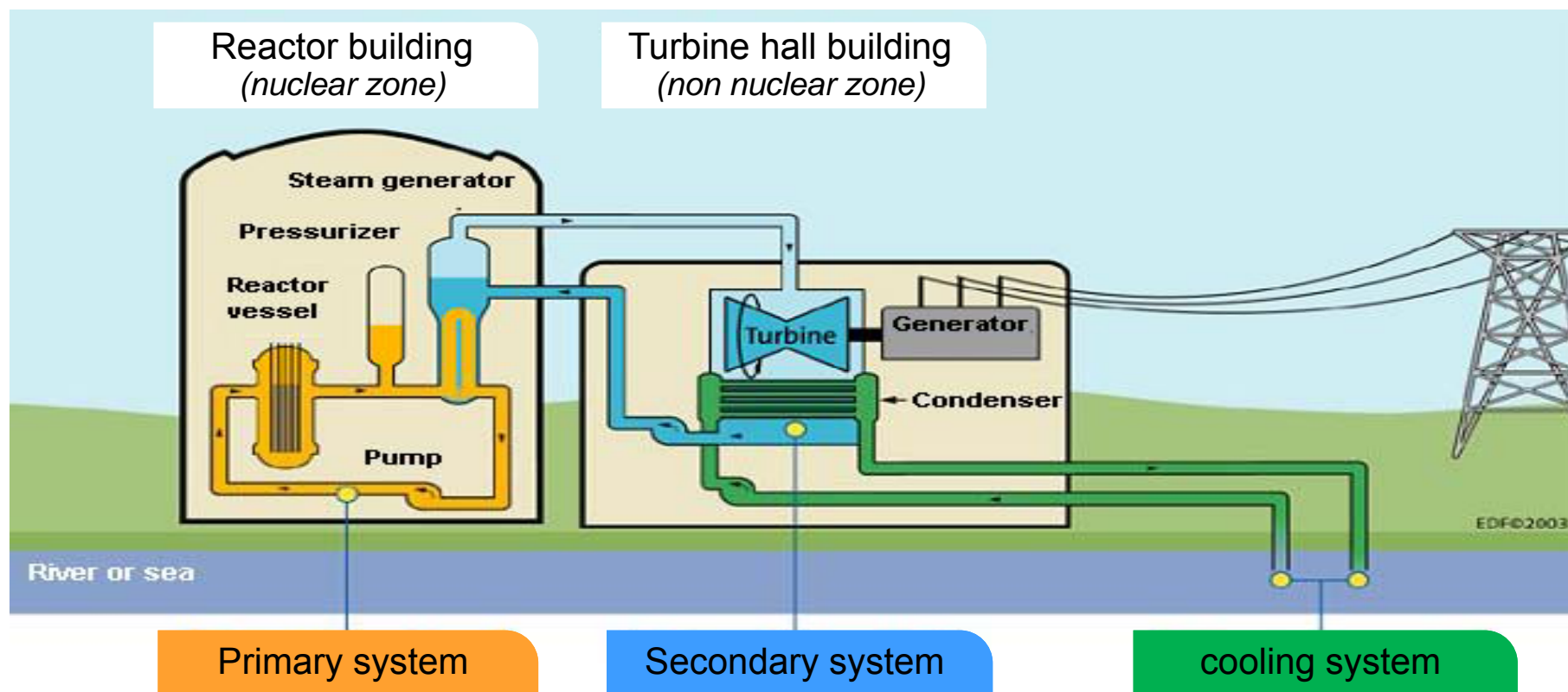
- Re-evaluating seismic and flood risks
  - New crisis-response systems in the event of an electricity outage
  - Adding mobile equipment to the sites
  - Reinforcing "venting" lines for boiling-water reactors
  - Improving instruments at spent-fuel pools
  - Bolstering communication tools for crisis response teams
  - Improving management procedures for serious accidents
- New regulatory constraints in the wake of Fukushima, which the NRC expects to be implemented by 2016



### LONGER TERM

- Reinforcement of temporary capacity for spent-fuel pools
- "Venting" capacities for pressurised water reactors
- Increase in filtration capacity of the "venting" lines of boiling- or pressurised-water reactors
- Increased control of hydrogen risk
- Control of situations in which cold water source is cut off

# PWR operating principles



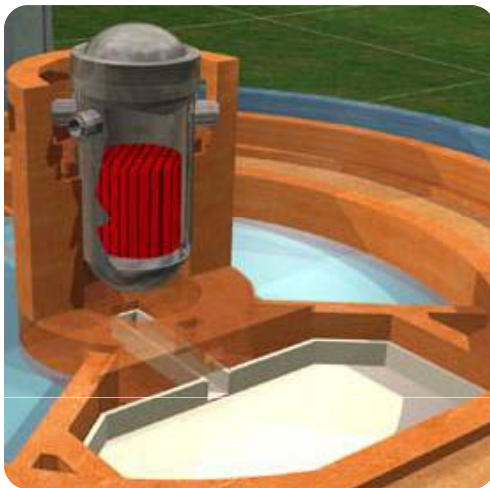


## EPR technological improvements made for:

- Safety:
  - Accident probability reduction (factor 10)
  - External hazard protection (aircraft shell)
  - Evolutionary design (core catcher)
- Performance:
  - Annual generation boosted over 36%
  - Thermal efficiency improvement (+ 3pts)
  - Increased availability (91%)
- Radiation protection:
  - 40% cut in present exposure
- Environment:
  - Very important reduction of radioactive waste and gaseous and liquid discharges



# EPR design improvements



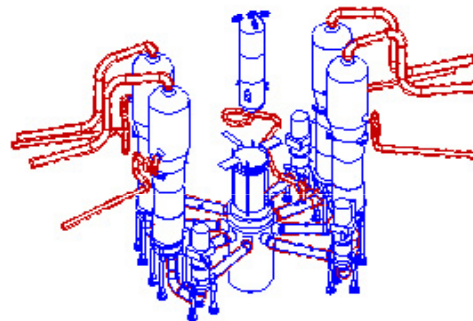
Core catcher in case  
of an accident



4 independant  
safeguard systems



Aircraft shell



systems and  
components  
improvement

## Flamanville 3 EPR: a first of a kind achievement, the feedback of which will benefit other projects

- Close cooperation with Areva teams on the French and Finnish EPRs
- Organisation designed to encourage Flamanville 3 feedback for the other projects
- An in-depth analysis of Flamanville 3 to improve scheduling for next EPRs:
  - 20 months of savings identified in Flamanville 3's first four years
  - Impact already seen at Taishan



# An update on the Flamanville 3 EPR project at the end of 2011

- First production targeted for 2016
- Construction costs of about €6 billion
- How far along is construction?
  - More than 88% of civil engineering completed
  - Engine room construction completed  
Turbo-alternator unit components being delivered
  - A full-scale simulator has been brought into service
  - Almost 21% of electro-mechanical assembly completed
- Project monitoring stepped up between EDF and its partners
- ASN review process:
  - Commissioning application currently being reviewed





## China (TNPJVC)

### Taishan 1 & 2 (EDF 30%)

- 2 EPRs under construction
- Construction work carried out in 2011:
  - Civil engineering work
  - Electro-mechanical assemblies
  - Dome installed on Unit 1 reactor building
  - Delivery of Unit 1 reactor vessel
- Commissioning of Unit 1 scheduled for 2014 and Unit 2 for 2015





## New Nuclear – Rest of the World

### United Kingdom

- The UK government re-affirms that it is continuing its nuclear programme
- July 2011: The "Nuclear Site Licence" for Hinkley Point approved by the nuclear safety authority.
- November 2011: Building permit approved by the Infrastructure Planning Commission (IPC)
- December 2011: The safety authority gives a preliminary green light to the design as part of the EPR certification process
- Preparation of main tender offers for the earthworks, civil engineering and the turbine room
- Second half 2012: EDF decides to invest in an initial pair of EPR reactors

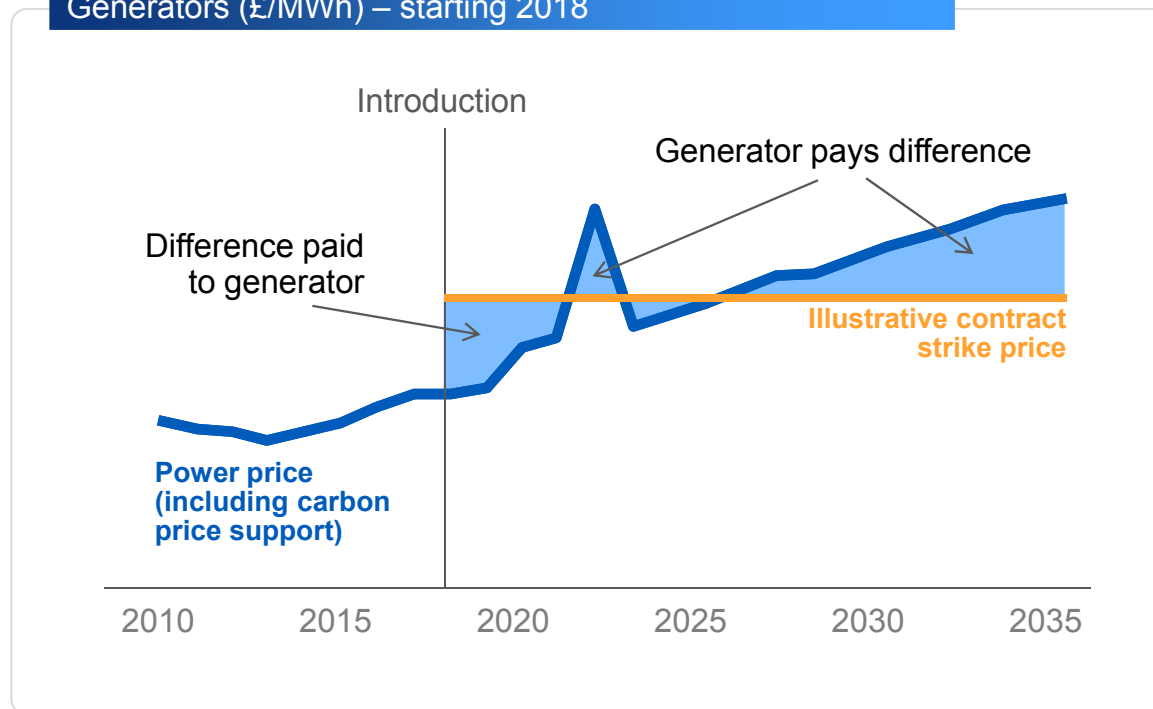
### United States

- Continued actions performed aiming to obtain a license for the EPR in the US



## In the UK, Contracts for Difference can provide the certainty investors need to build new low carbon plants

Illustrative Impact CfD on Revenues for Low Carbon Generators (£/MWh) – starting 2018



- Reduce market volatility and risks for investors
- Offers a fair deal for consumers
- Not a new mechanism
  - IPPs in the 1990s
  - Used extensively during the Pool
  - Common in commodities trading
- Can be tailored by technology
- Implementation issues manageable



## What are nuclear long term provisions?

- In France, EDF's provisions are calculated in accordance with the law of 28 June 2006 and relevant expenses are estimated based on the economic conditions of the year-end
- We may distinguish between two categories of provisions:
  - Provisions for back-end nuclear cycle expenses, covering
    - Provisions for burnt fuel management , including removal of spent fuel from EDF's generation centers and the processing (including recycling when possible)
    - Provisions for long-term radioactive waste management (see further for more details)
  - Provisions for decommissioning and for last cores
- Another way to look at it from a financial point of view is to separate them based on the necessity to cover the provisions with dedicated assets
  - Indeed, only provisions for decommissioning, for long-term radioactive waste management and a part of provisions for last cores are to be covered by dedicated assets (see financial section for more information on dedicated assets)
  - The rest of the provisions (mainly provisions for burnt fuel management) are part of the operating cycle and are accounted for above the EBITDA





## The plant dismantling cycle: 3 key steps



### ■ Final shutdown

- The first phase consists of unloading the fuel and draining all systems (after which 99.9% of on-site radioactivity has been eliminated), followed by decommissioning (dismantling of decommissioned non-nuclear installations)

### ■ Partial dismantling

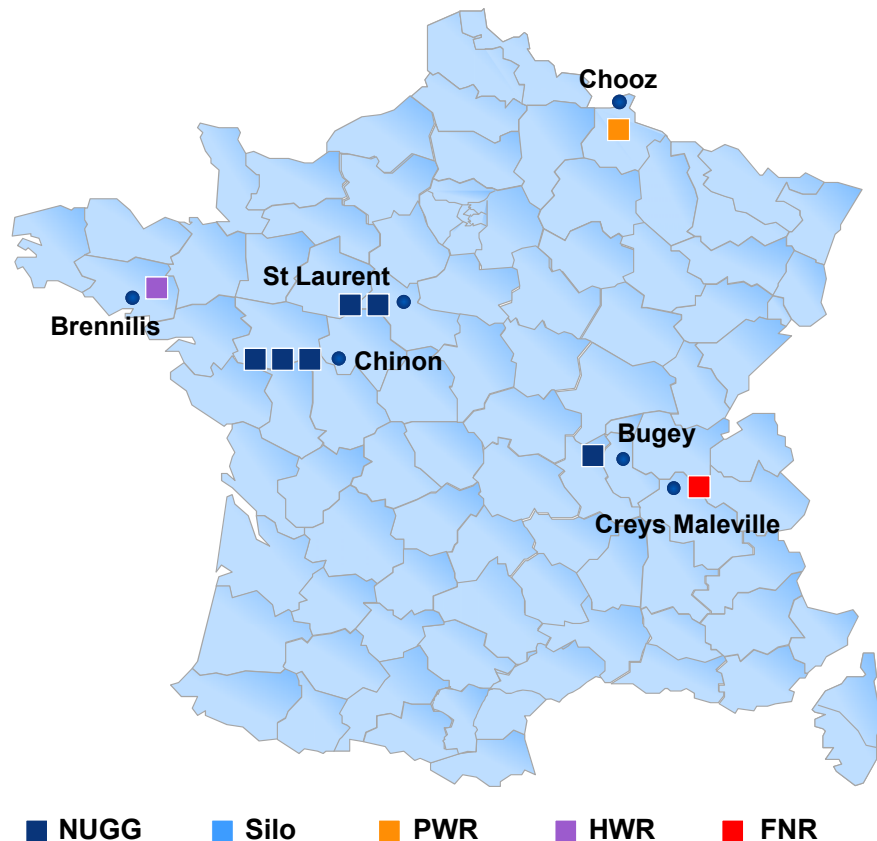
- The second phase consists in dismantling all equipment and buildings (with the exception of the reactor building), the packing and shipment of all waste to accredited storage and disposal facilities and monitoring of the reactor building

### ■ Full dismantling

- This final phase involves the full dismantling of the reactor building and of materials and equipment that are still radioactive, as well as the removal of waste produced in this phase 3

The duration and complexity of the three phases may vary according to the actual scope of the work that needs to be done

# EDF nuclear plants being decommissioned



In 2001, EDF decided to fully dismantle its nine mothballed plants over a period of 25 years instead of 50

- 1 pressurised-water reactor (PWR)
  - Chooz A (300 MW): 1967-1991
- 1 heavy-water reactor (HWR)
  - Brennilis (70 MW): 1967-1985 (EDF/CEA)
- 6 natural uranium / graphite gas reactors (NUGG)
  - Chinon A1 (70 MW): 1963-1973
  - Chinon A2 (200 MW): 1965-1985
  - Chinon A3 (480 MW): 1966-1990
  - Saint-Laurent A1 (480 MW): 1969-1990
  - Saint-Laurent A2 (515 MW): 1971-1992
  - Bugey 1 (540 MW): 1972-1994
- 1 fast-neutron reactor (FNR)
  - Creys-Malville (1,240 MW): 1986-1997



## International dismantling costs feedback

- An OECD-NEA study published in late 2003 listed all costs, in USD (as of 1 July 2001) reported by various PWR operators worldwide, with the following results:
  - Sweden: 93 USD / kW
  - Spain: 166 USD / kW
  - Belgium: 212 USD / kW
  - France: 225 USD / kW (with USD0.85 = 1 EUR)
  - Japan: 405 USD / kW
  - United States: 256 to 420 USD / kW
  - Germany: 270 USD / kW
  - Switzerland: 234 USD / kW
- Excluding extreme values (Sweden and Japan), reported costs are within the same order of magnitude, with France 10 to 15% below average, which can be explained by the series effect that may be reasonably expected for the PWR fleet
- EDF believes that the international benchmark published by the “Cour des Comptes” in January 2012 strongly underestimates the correction on the management of spent fuels and for the cost difference between the type of plants (especially UK reactors, which are more costly to dismantle), thus inflating its estimate of the dismantling costs

**A level of provisions in line with the international benchmark**



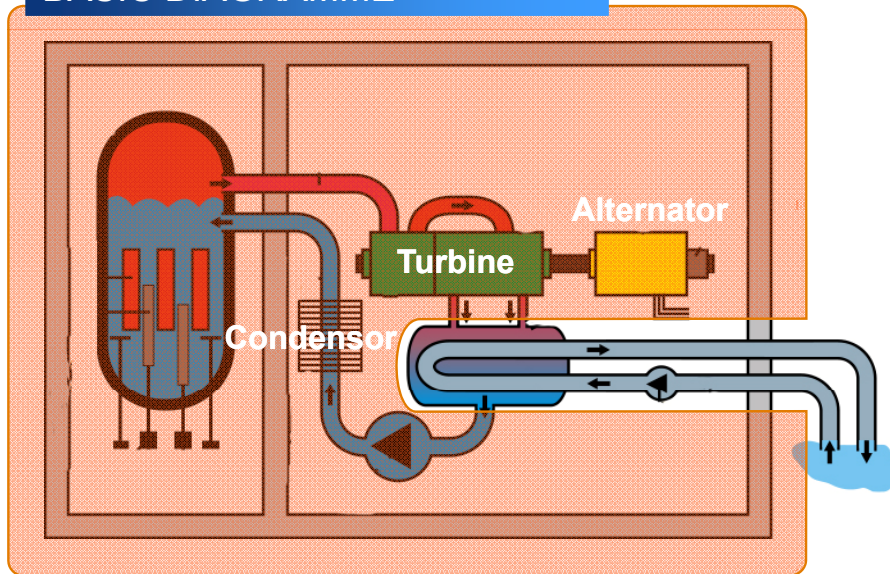
## Benchmarking vs. German plant operators

- A direct comparison of nuclear provisions (dismantling and downstream cycle) in EDF's accounts with German plant operators' provisions is hindered by the important provisions aggregation reported by German plant operators
- German plant operators' higher level of dismantling provisions, when compared to their installed base, may be due to several factors :
  - **The effect of discounting, as the French fleet is younger:** a 10-year time lag lowers provisions by 25%
  - **Differences in scope:** in Germany, dismantling costs include the costs of building and operating an on-site spent fuel storage building
  - **The effect of greater volumes and standardization of processes and a lower dismantling cost for PWR reactors than for all the other types of reactors**
  - **Structural differences in organization and industrial choices** (German reactors are of various types and are run in a decentralized manner, in contrast to the integrated and standardized fleet in France)

EDF's specific factors explain why its nuclear provisions are lower than some other operators

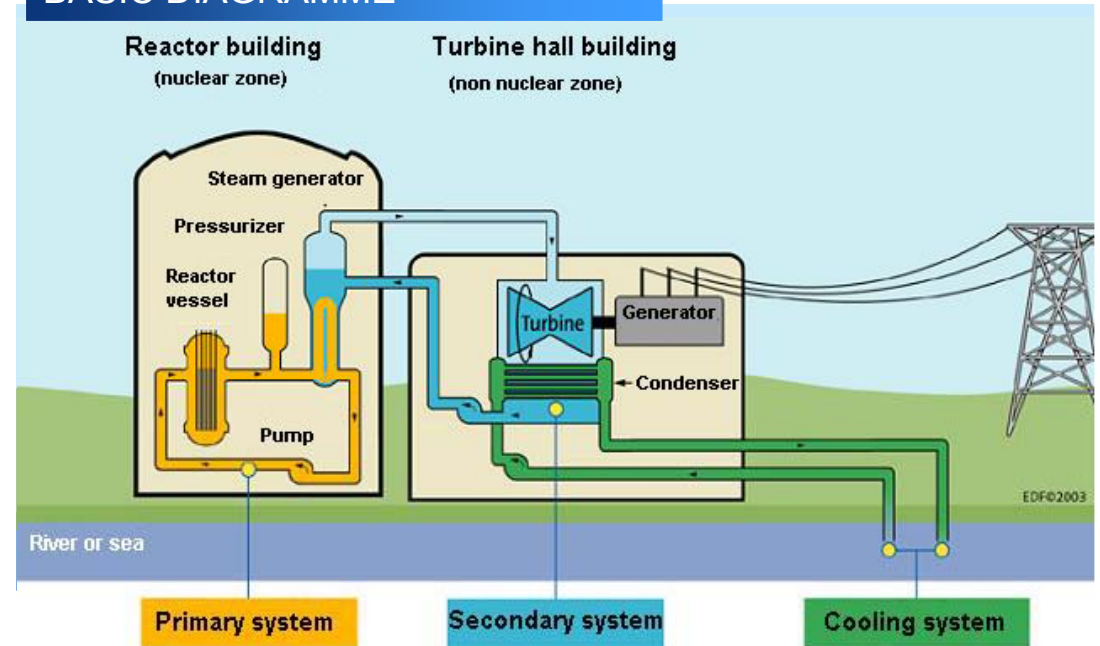
## BWR vs. PWR comparison

Boiling-water reactor  
BASIC DIAGRAMME



 Zone generating nuclear waste upon dismantling

EDF Pressurised-water reactor  
BASIC DIAGRAMME



A boiling water reactor (BWR) has more areas contaminated by primary circuit water and larger areas generating nuclear waste than a pressurised-water reactor (PWR)



## What is covered by long-term management of radioactive waste?

- Evacuation and storage of radioactive waste from the dismantling of nuclear facilities
- Evacuation and storage of radioactive waste from the treatment of spent fuel in La Hague
- Long term warehousing and direct storage not recyclable on an industrial scale in existing facilities
- EDF share of evaluation costs and costs of coverage, closure and supervision of storage centers:
  - Existing centers for very low-level, low-level and intermediate-level radioactive waste
  - Centers need to be created for long-lived radioactive waste



## Storage of long-lived nuclear waste (LLW)

- An initial project from 2005 (€14bn 2005) set up by the French Energy and Climate directorate serves as a benchmark, with regularly updated cost estimates
- Stepped up cooperation between ANDRA and nuclear operators
  - All task forces (Roussely, experts, Finance Ministry auditors, etc.) recommended that EDF, AREVA and CEA be partners in the project
  - A partnership agreement set up between ANDRA and producers, in order:
    - to call on nuclear operators' expertise in targeted areas
    - to organize detachments of skilled persons for the team project
    - to step up project governance interface in the role as clients, in light of their legal responsibilities
- EDF, AREVA and CEA have developed an alternative plan that ensures industrial-scale storage and cost control
  - Drawn up with construction professionals
  - Feasible with a tunnel-boring machine
  - Project start-up in 2017
  - Consistent with 2005 estimate

New estimates are expected beginning 2013. Until then, the benchmark remains the 2005 cost estimate



## EDF main businesses

### Generation

Nuclear

Hydropower & renewables

Key highlights

Hydropower

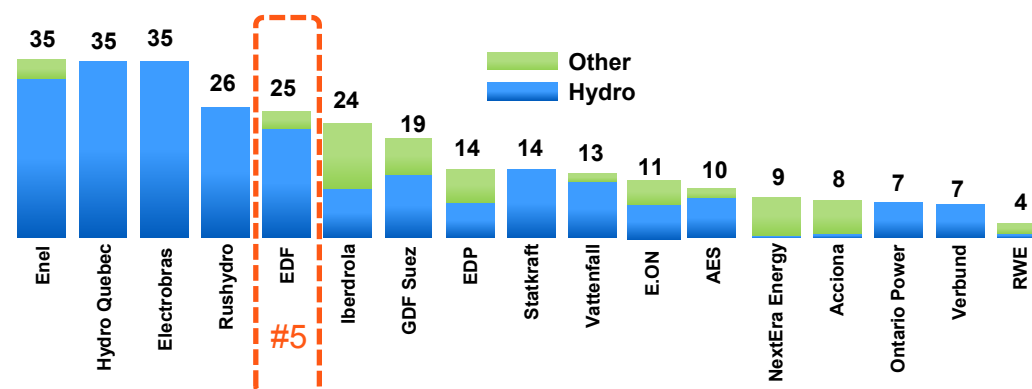
Other renewables



# A leader in hydropower and other renewable energies

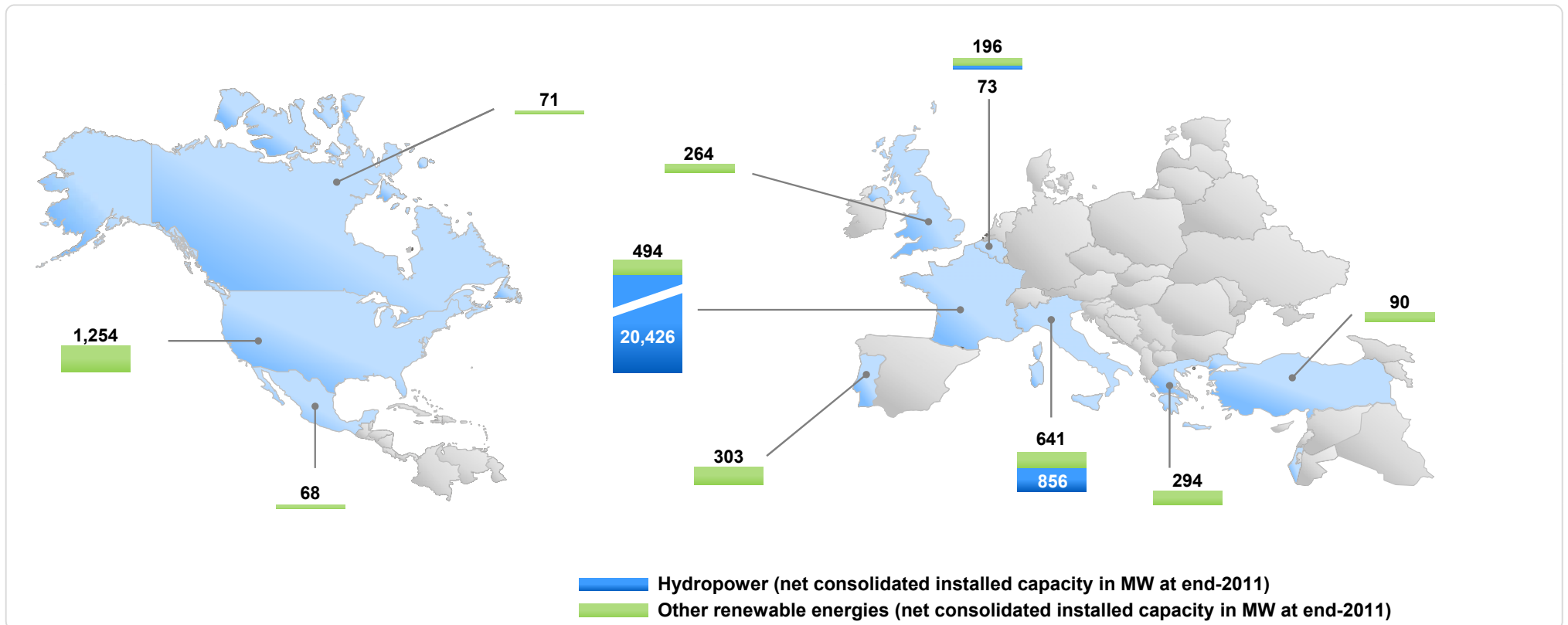
- Europe's leading hydropower producer
  - 239 EDF dams in France, 68 hydropower plants in Italy<sup>(1)</sup>
- Architect and lead contractor on international hydro projects
  - 1 large dam commissioned in Laos, feasibility studies conducted in Brazil
- A major player in the green energies market
  - EDF EN among the world top 10 leaders in wind and solar
  - EDF EN is expanding in Europe and North America
  - On 14 August 2011, EDF took over 100% of EDF Energies Nouvelles, its listed renewable subsidiary, after the squeeze-out of minorities
- Wind power and solar photovoltaic: supporting a growing industry
  - EDF EN is involved in the development of new offshore wind capacities (construction of a farm in the UK, participation in the creation of another in Belgium)
  - Research in new technologies (thin-film solar)

Renewable installed capacity (GW)



EDF bought out EDF EN in H1 2011, so as to strengthen the EDF Group's economic exposure to future value creation of renewable energies

# EDF: major positions in renewable energies



A diversified portfolio with over 25 GW in installed capacity, with 25 GW in ten countries

Source: EDF, EDF EN

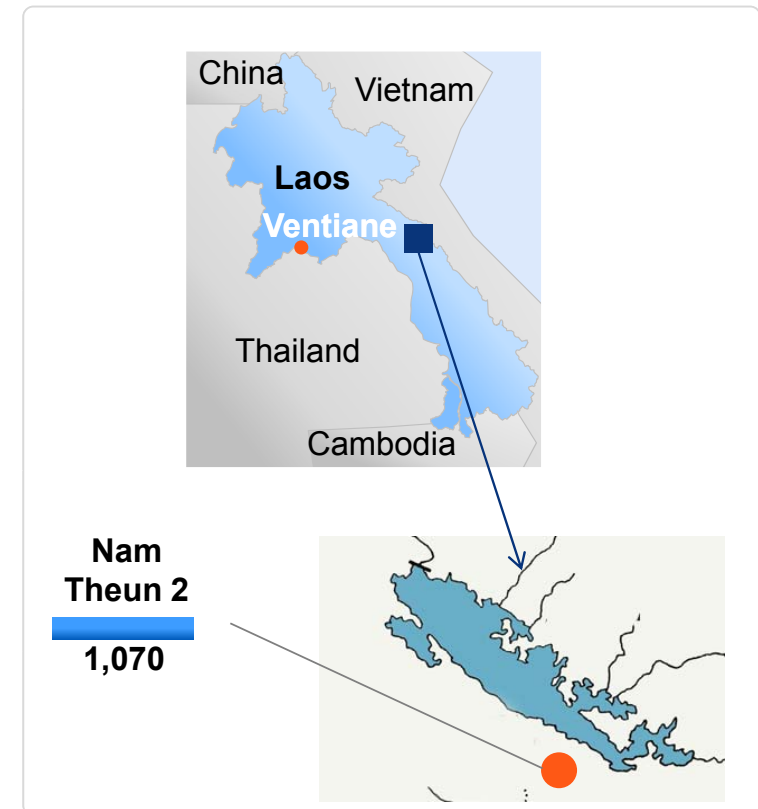
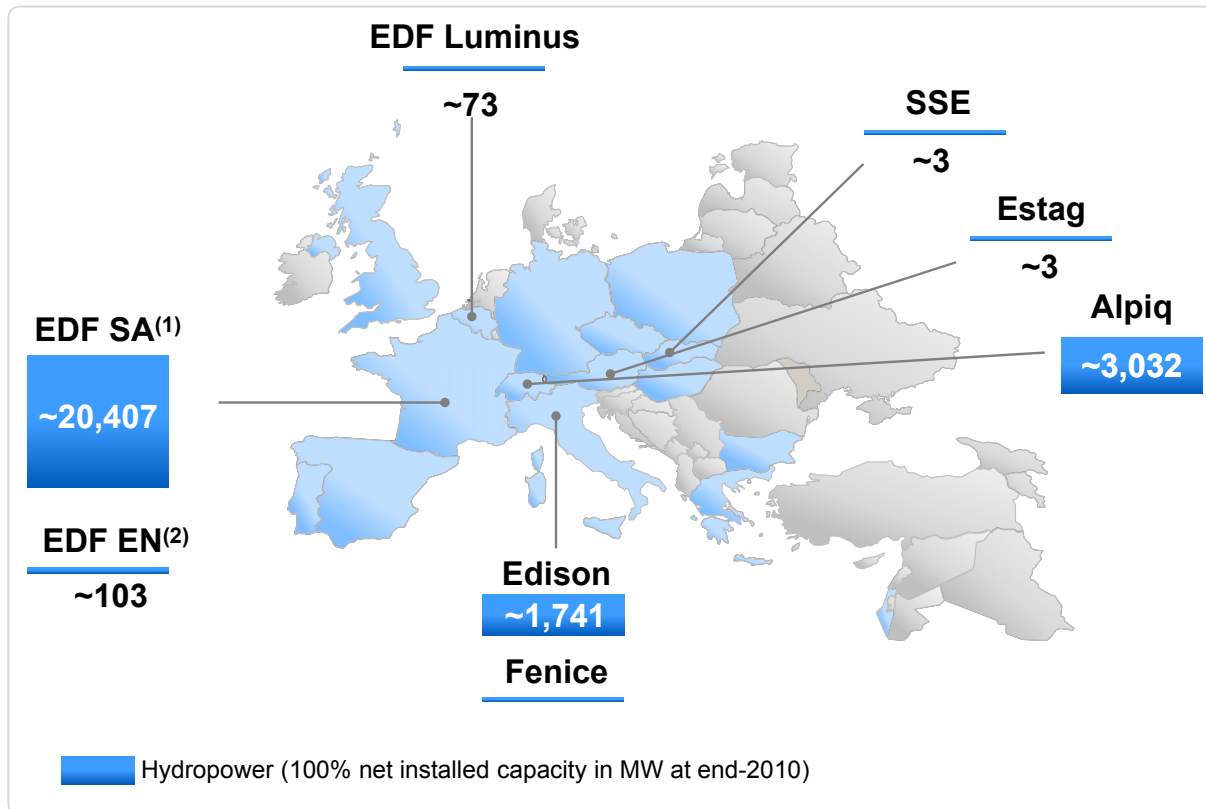
Note: These figures are consolidated figures, excluding any minority financial participations  
The pipelines are indicated for EDF EN

## Hydropower: 2011 Highlights

- Spring 2011: New concession in the town of Kembs commissioned French and Swiss governments. Increase in the water flow to flora and fauna; construction of a new 8.4-MW plant
- May 2011: Two 5-year approvals for EDF to reinforce the safety of hydropower facilities obtained from the Ministry of Ecology, Sustainable Development, Transport and Housing. These two approvals are genuine recognition of EDF's hydropower competency with regard to the construction safety
- 6 October 2011: Government approves EDF's proposed reconfiguration of the dam in Poutès (Allier). The current 17-meter high dam will be modified, becoming a 4-meter high structure equipped with a spillway enabling better fish migration. Cost of works: approx. €11 million
- October 2011-January 2012: Preliminary tests of the marine current turbine project under real conditions off the coast of Paimpol-Bréhat



# Hydropower in the EDF Group



(1) Including French Islands activities and excluding The Rance tidal power plant

(2) The EDF EN figure does include the whole installed capacity worldwide

Note: these figures are including minority financial participations

## Different types of hydropower facilities

**EDF boasts a variety of hydropower facilities, able to meet baseload and peak demand, designed to optimize the use of water resources**

- **Run-of-river**
  - No storage capacity
  - Energy generation depends solely on speed of water flow
- **Pondage water**
  - Average size water reserve (daily or weekly)
  - Generation is concentrated at peak hours
- **Reservoirs**
  - Large storage capacity
  - Influence on downstream plants, which calls for management of valley stations
  - Development of management strategy: trade-off between immediate gain and future gain to maximise the asset's value
- **Pumped storage (STEP)**
  - Water is pumped from a downstream reservoir to an upstream reservoir to create a reserve during off-peak hours
  - Water is turbined from the upstream reservoir to the downstream reservoir during periods of high demand
  - Grand-Maison, Revin, Montezic, Super Bissorte, La Coche, Le Cheylas, Lac Noir

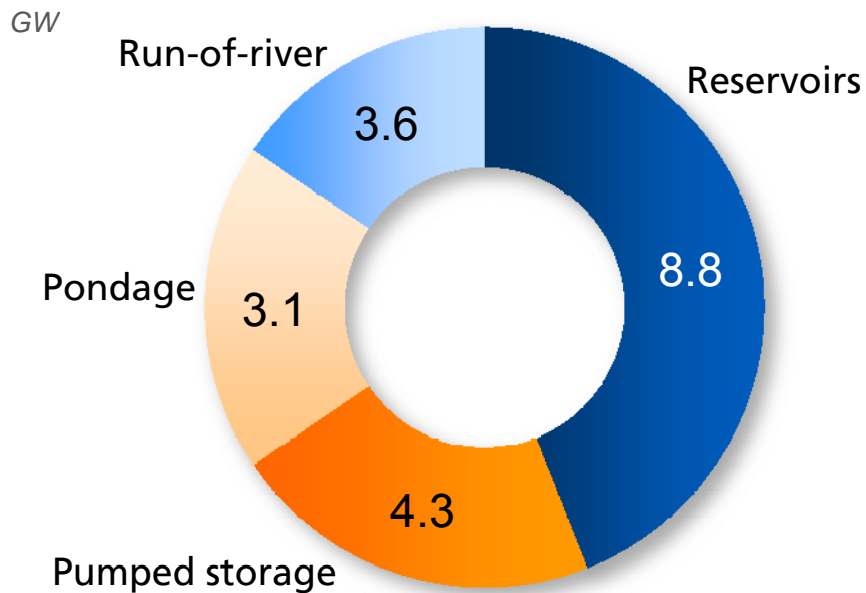
## EDF's hydropower fleet in France

- 2011 gross output (excl. Island Energy Systems) = 33.7 TWh(1)
- Benefits of hydropower
  - Speed, availability and flexibility
  - Renewable energy: annual savings of 13 million ToE (tons of oil equivalent)
  - Water storage capacity (peak energy, cold source for thermal and nuclear generation)
  - Able to provide system services to the network (adjustment of frequency and voltage)



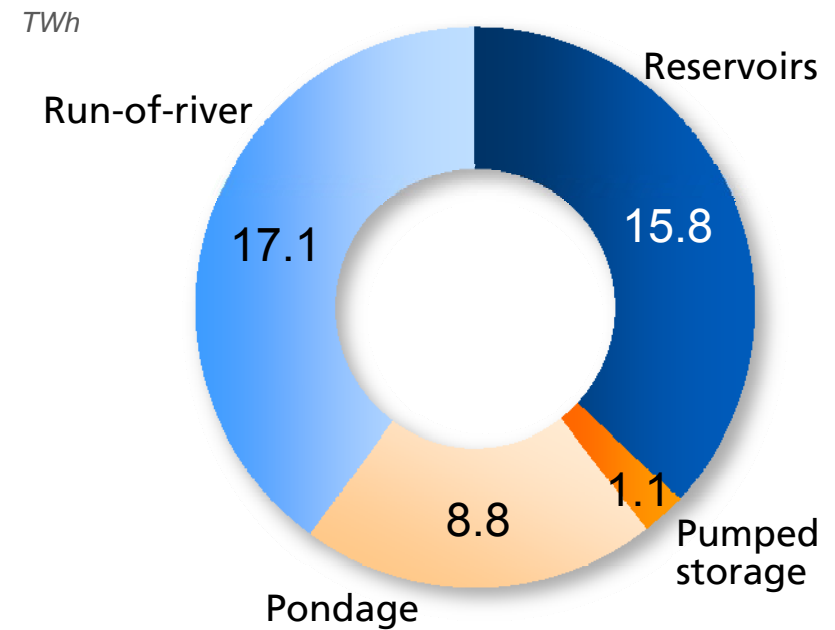
## EDF's hydropower fleet in France

Installed capacity ~20 GW



≈ 20% of the overall EDF generation capacity

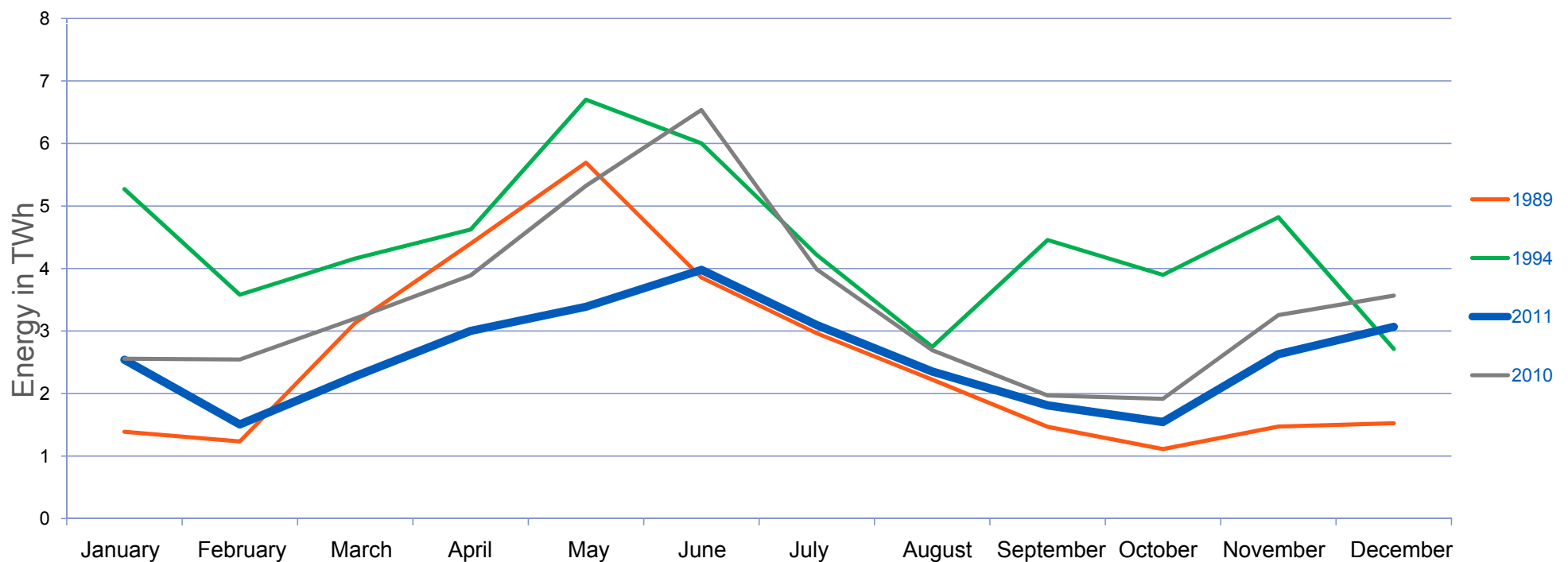
Theoretical maximum generation : ~45 TWh



≈ 9% of the average EDF output

# Hydropower: generation potential varies with weather

23 TWh difference between highest and lowest annual generation potential for the last 25 years



**Hydro generation potential: maximal energy that can be produced from water supply (rain, snow, tidal) over a given time period**



## Managing our exposure to water risk

- EDF Group's **exposure to water risk is significant** as it is closely linked to electricity and steam generation activities in France and worldwide
- EDF has clearly identified this risk and implemented organizational procedures along with improvement processes for relevant risk management
  - **France:** EDF has defined a water policy, established a dedicated department with a Water Coordinator and a Water strategic committee, along with local administrative authorities
  - **UK:** the main generation facilities are nuclear power plants and are located on the coast. The water issue has undergone a detailed analysis in the context of risk assessment in accordance to the definition of the climate change adaptation plan
  - **Italy:** facilities are located primarily on the coast. Most of the others are located in Northern Italy where water issues are less restrictive. No crisis has been observed over the past years, in spite of water and temperature constraints

# The Group's commitments towards public policies, current national and international thinking in the field of water

## ■ Some examples, but not limited to:

- Participation in the **WBCSD** (World Business Council for Sustainable Development) particularly in the topic of implementation of a water risk assessment tool for energy operators, within the Global Energy and Water Initiative, and membership in the Water Leadership Team
- Participation in the **World Energy Council** (whose chairman is the former EDF Chairman), with presentation of a research paper entitled “Water for Energy”
- Participation in the **World Water Council**, with substantial contribution to its working groups in preparation for the next World Water Forum focussing on Water and Energy; pending signature of a partnership agreement dedicated to Water/Energy issues
- In France, EDF contributes extensively to research and action programmes on water, in liaison with the Water Agencies and Water Basin Authorities, including in the context of “Competitiveness Clusters” on water and at the Mediterranean Water Institute.

## Investments in hydropower facilities

### ■ The Renewal project for modernising operations and maintenance

- Gradual deployment across all units from 2012 to 2018

### ■ Features of the project:

- Overseeing facilities and remote intervention via e-operations, modernising the control-command systems
- Substituting conditional and preventative maintenance to repair
- Optimising maintenance outages
- Modernising the information system by shifting to computer-aided maintenance
- Simplifying management of small hydropower structures

### ■ Gains expected in:

- Increasing output potential
- Making temporary power available at peak times
- Making additional system services available

2015 gains estimated > €90m

## Example of a hydropower replacement project: Romanche-Gavet (Isère department)

- Replacement of six hydropower plants by a single, underground facility
  - A €250m investment
  - 93 MW capacity
  - Construction begun in 2011; plant set to come on line in 2017
  - 155 GWh potential output gain
  - A 60-year concession



## Renewal of hydropower concessions

- Ten valley concessions opened to public procurement
  - Representing 49 hydroelectric plants (5,300 MW) and roughly 20% of the French hydropower capacity, mainly managed by EDF (4,315 MW), as well as GDF-Suez, in the Alps, the Pyrénées and the Massif Central
  - To put together these valley concessions, the French government decided that 13 of them are to be renewed early (c. 2,300 MW), of which 12 controlled by EDF. Outgoing operators will receive compensation for the lost income stemming from the early termination of the concession, in accordance with the terms of the concession agreement
  - The concessions held by EDF which are up for early renewal account for concessionary and average annual generation output of 6.8 TWh, i.e. 15% of EDF's total hydropower output
  - EDF filed by the end of 2010 nearly all the end of concession requirements needed before filing for renewal (with the exception of upstream Lot river & Maronne)

Depending on the concession, calls for tenders are scheduled to take place from H2 2012 with the contracts to be awarded from 2013 to 2015

## Scope of concessions open to public procurement (MEEDDM press release of 22 April 2010)

Given the complexity of the procedure, the French government should update in the first semester of 2012 the initial agenda published on 22 April 2010. As far as the concessions of Lac Mort and Drac are concerned, the planning has been reviewed and published by the DREAL Rhône Alpes with dates of award expect mid 2015

Valley	Date awarded	Concessions at term		Concessions up for early renewal	
	(announcement April 2010)	Capacity (Total max capacity in MW)	Concession end date	Total max capacity (MW)	Concession end date
<b>Lac Mort</b>	End 2013	10	2011		
<b>Ossau (SHEM)</b>	End 2013	303	2012		
<b>Têt (SHEM)</b>	End 2013	37	2012		
<b>Louron (SHEM)</b>	End 2013	56	2012		
<b>Drac</b>	Mid-2014	110	2011	108	2032
<b>Truyère/ Upstream lot</b>	Mid-2014	701	2012	1,213	2021 to 2035
<b>Bissorte-Super Bissorte</b>	End 2014	882	2014		
<b>Dordogne (EDF/SHEM)</b>	End 2015	286 (EDF)	2012	832 (EDF)	2020 to 2032
<b>/ Maronne</b>	End 2015	200 (SHEM)	2012	133 (SHEM)	2062
<b>Beaufortain</b>	End 2015	128	2015		
<b>Brillanne-Largue</b>	End 2015	45	2015		
<b>Total</b>		<b>2,758 (2,162 MW EDF)</b>		<b>2,286 (2,153 MW EDF)</b>	

Generation

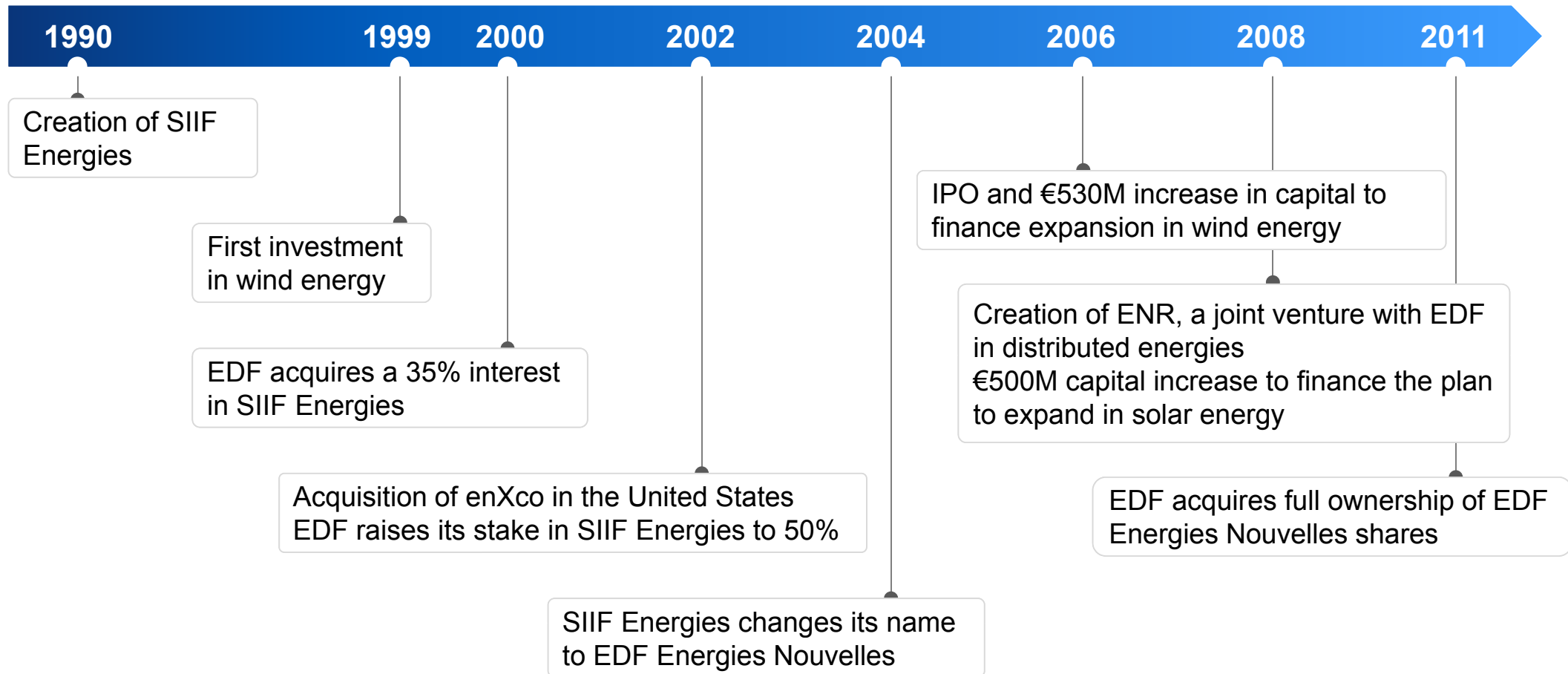
Hydropower & renewables

Key highlights

Hydropower

Other renewables

## EDF Energies Nouvelles: history in brief





## Strengthening of EDF/EDF EN's competitiveness in a shifting environment

- A logical industrial fit that continues to leverage the two companies' assets and expertise...
  - EDF's R&D and engineering expertise
  - EDF EN's developer know-how
- ... while strengthening the Group's positions to better meet the new challenges facing the sector:
  - Increase in the unit size of projects – utility scale solar power systems
  - Increased complexity – offshore wind power
  - Emergence of major global operators

The successful combination of the know-how of a major power producer and a renewable energy developer : integration within EDF will enable EDF EN to continue its targeted development strategy

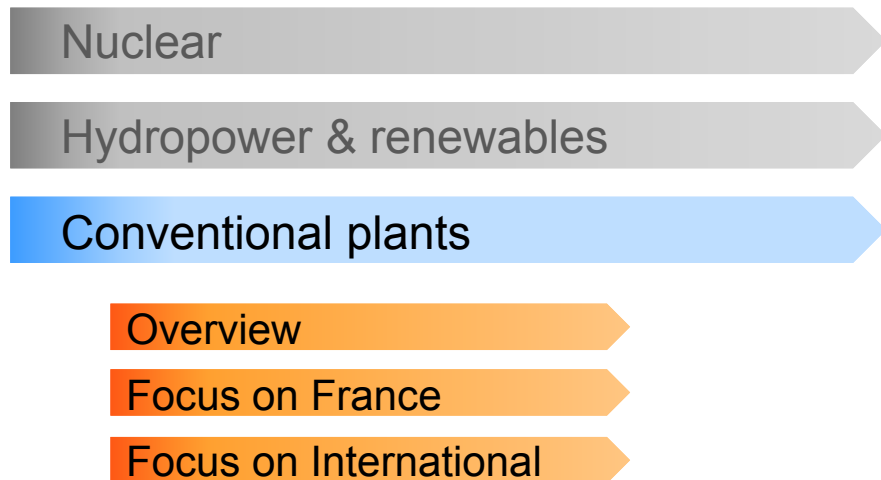
# EDF EN – installed capacity and capacity under construction by type, at end-December 2011 (excl. Hydro)

		Installed capacity				Capacity under construction			
		31 December 2010		31 December 2011		31 December 2010		31 December 2011	
		Gross	Net	Gross	Net	Gross	Net	Gross	Net
<b>Wind</b>									
	France	389.1	355.4	389.1	365.4	23.0	23.0	47.0	23.5
	Portugal	495.8	302.9	495.8	302.9	-	-	-	-
	Greece	251.4	232.1	314.7	288.3	112.6	111.2	45.0	45.0
	Italy	365.0	182.5	487.0	304.9	122.0	98.0	38.0	38.0
	UK	227.2	163.2	233.7	166.5	68.5	34.3	242.0	121.0
	Germany	7.6	7.6	7.6	7.6	-	-	24.0	-
	Belgium	30.0	5.5	30.0	2.7	295.2	54.0	295.2	27.0
	Turkey	128.2	51.8	219.2	89.8	91.2	38.1	114.9	28.7
	Mexico	67.5	67.5	67.5	67.5	-	-	164.0	164.0
	USA	961.1	878.1	1 276.9	1 193.9	205.5	205.5	140.0	140.0
	Canada	-	-	-	-	-	-	380.0	305.0
<b>Total Wind</b>		<b>2 922.9</b>	<b>2 246.6</b>	<b>3 521.5</b>	<b>2 789.5</b>	<b>918.0</b>	<b>564.1</b>	<b>1 490.1</b>	<b>892.2</b>
<b>PV</b>									
	France	70.2	69.4	158.4	129.1	112.5	64.6	270.7	137.4
	Italy	90.9	70.2	122.2	92.2	27.6	20.1	1.0	1.0
	Spain	35.3	22.7	46.0	32.3	-	-	2.2	1.9
	Greece	6.0	6.0	6.0	6.0	-	-	5.6	5.6
	USA	6.1	6.1	10.5	10.5	22.5	16.6	7.6	7.6
	Canada	58.7	58.7	70.5	70.5	-	-	-	-
<b>Total PV</b>		<b>267.1</b>	<b>233.2</b>	<b>413.5</b>	<b>340.6</b>	<b>162.6</b>	<b>101.3</b>	<b>287.1</b>	<b>153.5</b>
<b>Total Other Renewable</b>		<b>232.6</b>	<b>183.3</b>	<b>189.7</b>	<b>161.5</b>	<b>8.5</b>	<b>6.7</b>	<b>4.3</b>	<b>3.2</b>
<b>Total Group</b>		<b>3 422.6</b>	<b>2 663.2</b>	<b>4 124.7</b>	<b>3 291.6</b>	<b>1 089.1</b>	<b>672.0</b>	<b>1 781.5</b>	<b>1 048.9</b>

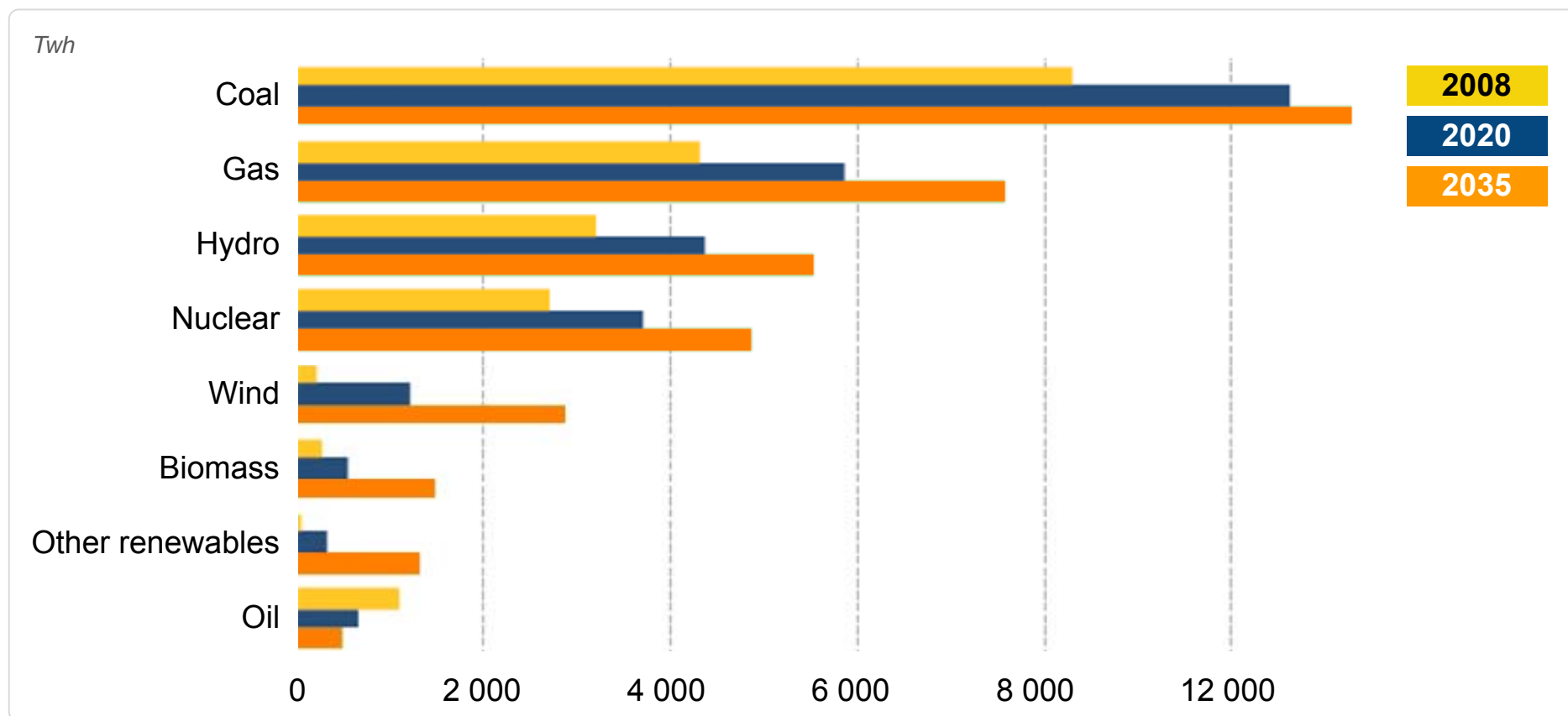


## EDF main businesses

### Generation



# Fossil Fired Generation is likely to remain the number one source of electricity generation in the world



# EDF is well positioned to meet new challenges of fossil-fired generation

- EDF experience in fossil-fired generation is reflected by existing assets and current investments in France and abroad
  - An important part of the energy mix for the Group (13%), varying between the countries (2.6% of EDF 2011 French generation, 84% in Italy)
  - Development of plants / IPPs in Asia (China, Vietnam), South America (Brazil) and Europe
  - Growing use of gas technologies : construction & operation of CCGTs\* (4 in France and 3 in the UK)
- Towards better environmental performance
  - Use of CCGTs and supercritical plant technology, more efficient and with better environmental performance (JV in China with Sanmenxia 2 supercritical power plant, RUDA project in Poland, CCGT with the Flex Efficiency 50 turbine of GE in Bouchain in France)
  - Research focusing on carbon capture and storage (pilot unit in Le Havre in France as far as carbon capture is concerned)
- Towards better technical performance
  - Target is to increase responsiveness and flexibility of fossil-fired plants to compensate for the increasing volatility of generation from renewable energies

Did you know?

**Existing fleet**  
**~34.5 GW<sup>(1)</sup>**  
Installed worldwide



**23.7 GW**  
made up of fuel-fired  
and coal plants

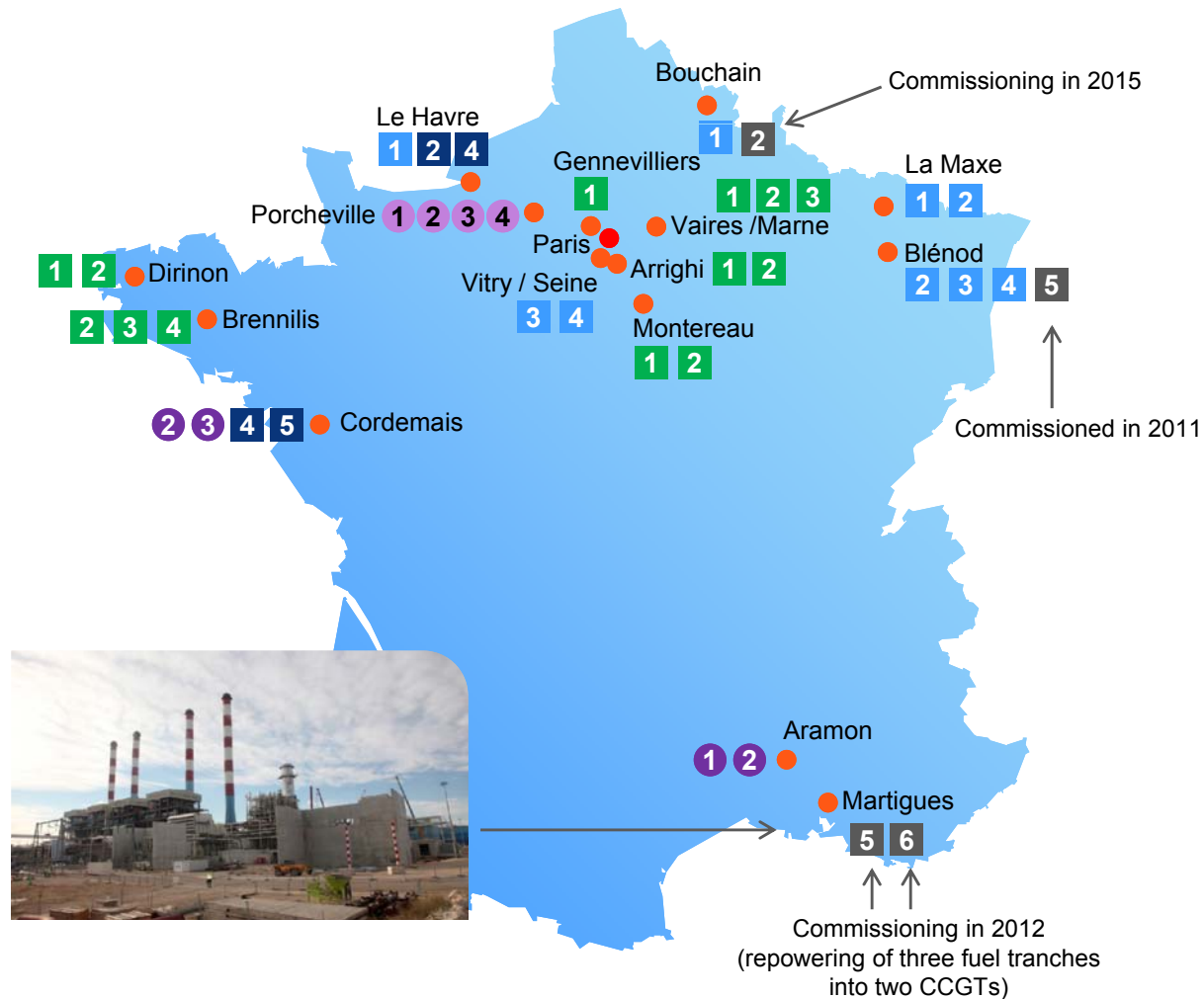
**10.7 GW**  
made up of gas-fired  
plants (*incl. cogeneration*)

<sup>(1)</sup>Net capacity installed

## EDF's fossil-fired fleet: 2011 highlights

- Throughout 2011, investments have been made to equip two oil-fired units (Porcheville 600MW and Cordemais 700 MW) with low Nox burners to cut Nox emissions by 50-70%. Investments will be completed end of 2012
- April: Decision to extend operations of 1,800 MW coal-fired tranches (Le Havre 4, Cordemais 4 and 5). €480m in investments for replacing and renovating strategic components
- June: combustion turbine in Gennevilliers (203MW) restarts
- October:
  - Gas-fired combined cycle plant in Blénod (430MW) comes on line
  - The two Montereau combustion turbines (2 x 185MW) can operate using natural gas or domestic oil
- December:
  - Investment decision for building a supercritical coal-fired plant (900MW) in Rybnik, Poland (approx. €1.8bn - commissioning expected in 2018)
  - Partnership inked with GE Energy for co-developing next generation of gas-fired combined cycle plant (510 MW), to be built on the Bouchain site. Commissioning expected in 2015

# EDF thermal plant fleet in France



## Coal fired plants

■ Nine 250 MW units

■ Four 600 MW units

## Fuel oil fired plants

● Four 600 MW units

● Four 700 MW units

## CCGTs

■ Three units under construction, one commissioned in 2011 (430 MW)

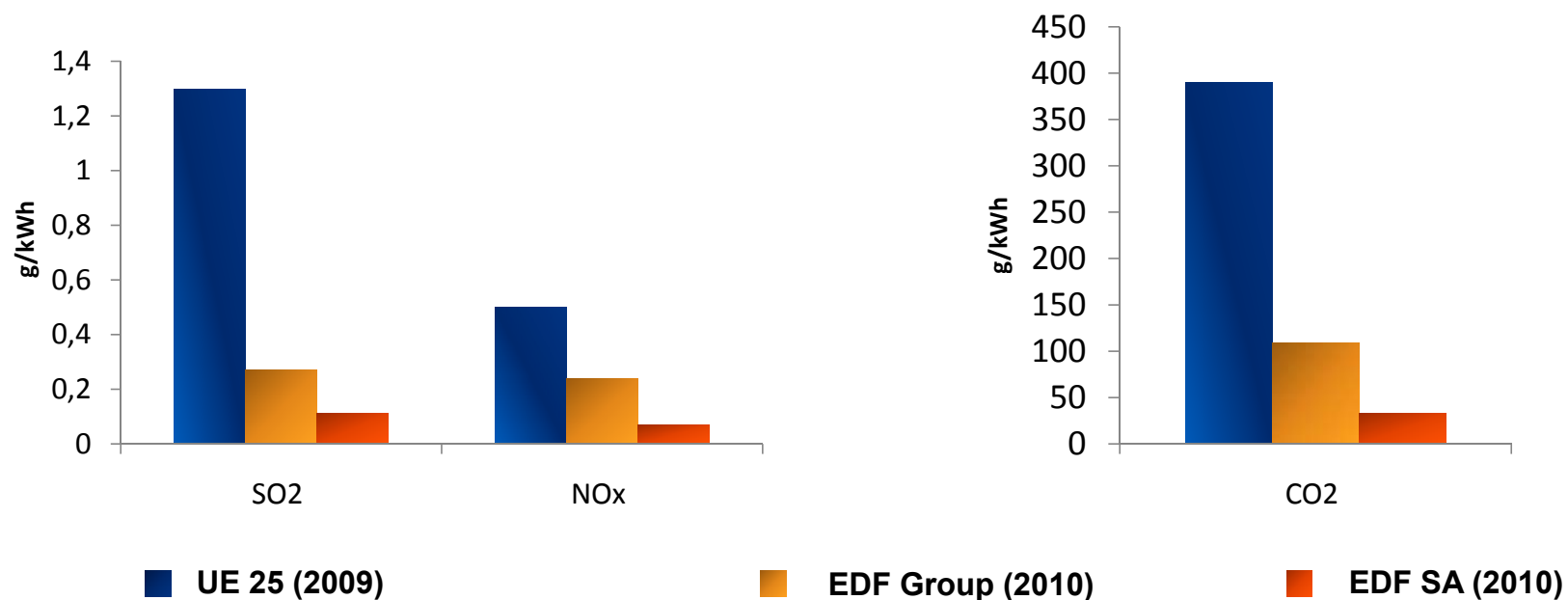
## Combustion turbines

■ 13 turbines totaling 1,856 MW



# EDF Group Air specific emissions compared to those of European sector

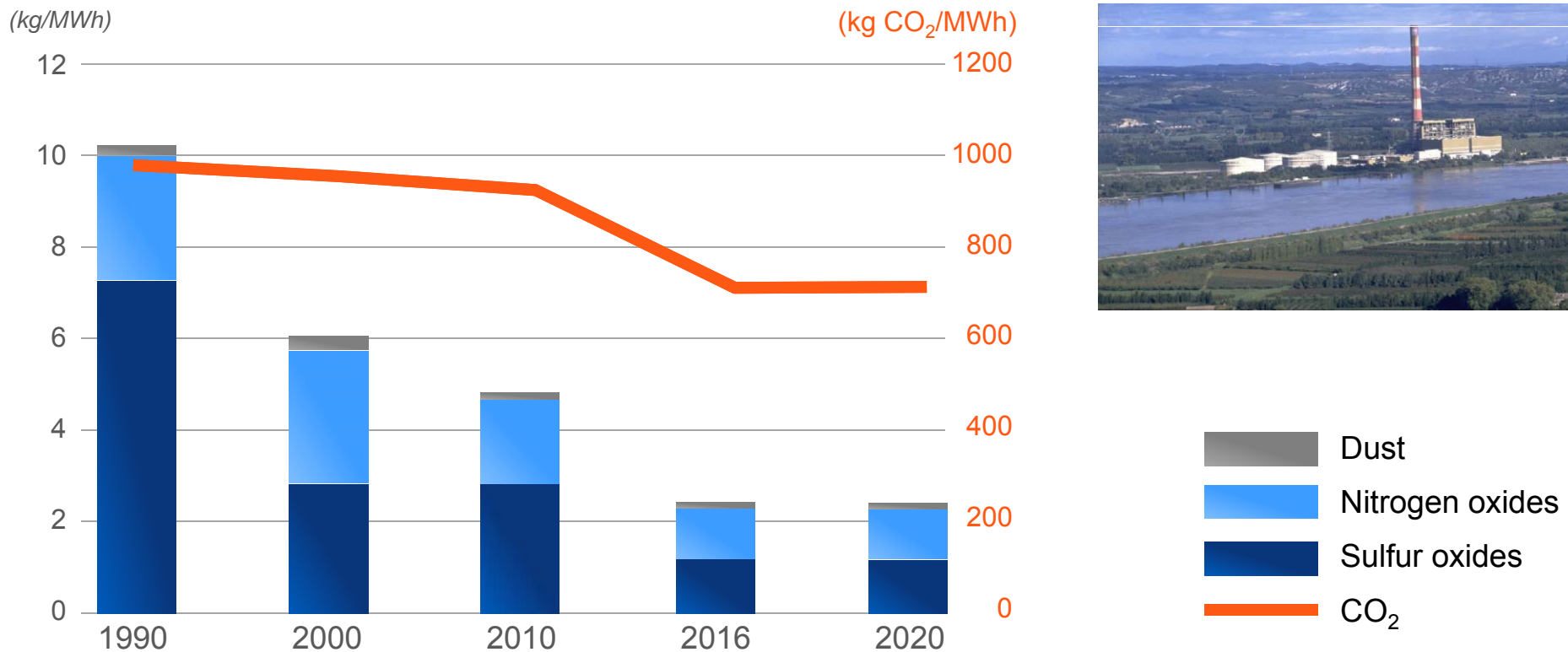
EDF specific emissions versus EU-25 Electric Industry emissions



Source: Eurelectric 2010

# An industrial project for better environmental performance

## Atmospheric emissions from fossil-fired plants in France



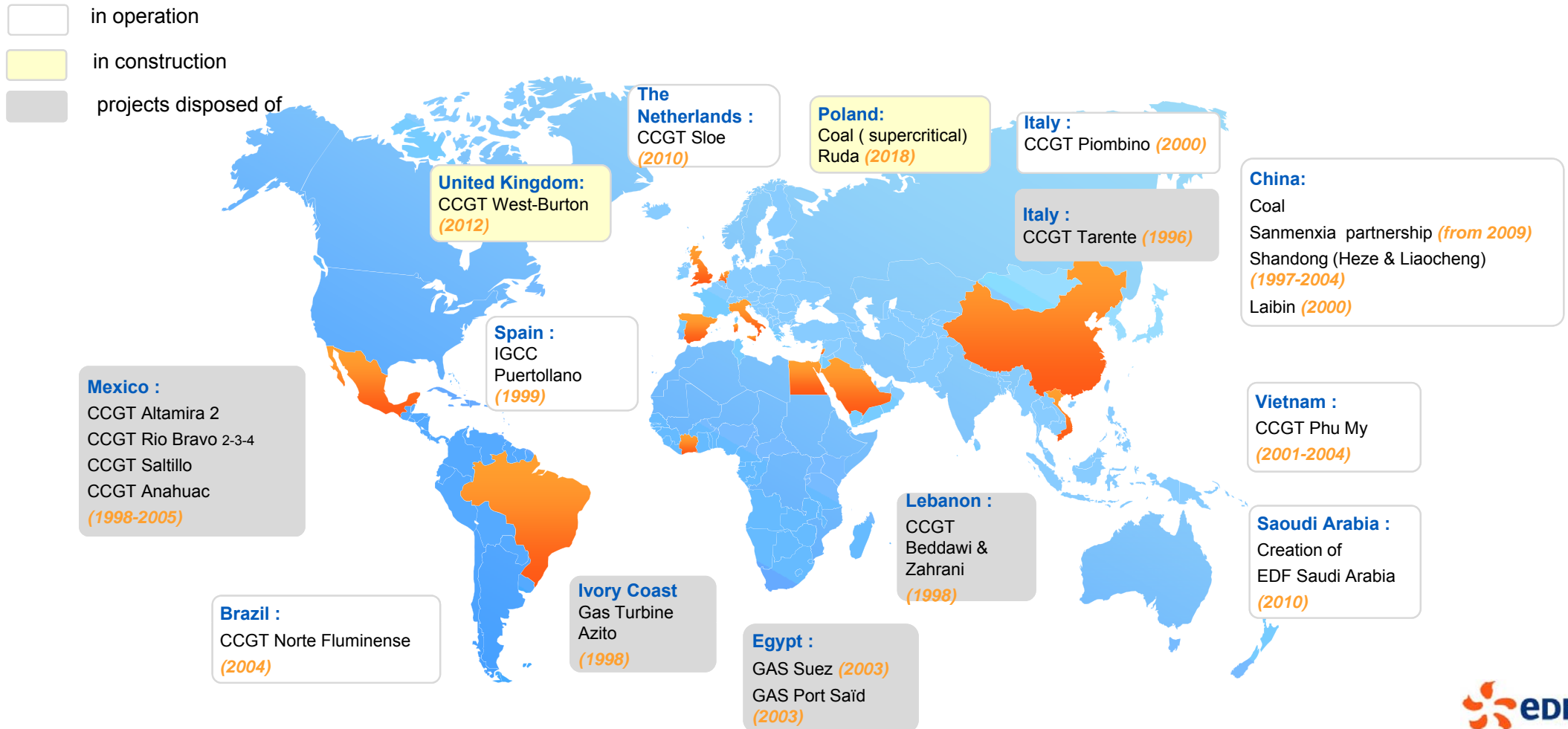
## Focus on RUDA: project for an advanced supercritical coal-fired unit (900 MWe) in Rybnik, Poland

- Financial characteristics:
  - Investment approx. €1.8bn
  - Project within the 2011-2015 capex plan meeting new investment criteria announced on 29 July 2011
- Technical specifications:
  - Replacement of 4 existing units: commissioning due in 2018
- Industrial plan:
  - EDF, architect-assembler for the project
  - Alstom will provide the power block (boiler island and turbine hall)
- Efficiency of 45% vs. 37% currently
- Environmental impact reduced:
  - 22% fewer CO<sub>2</sub> emissions (8% via biomass co-combustion)
  - 5-fold reduction in dust and sulphur oxide
  - Nitrogen oxide emissions cut in half



15% increase in the site's annual output, serving 6.4 million people in Poland

# International projects by EDF



EDF main businesses

Generation

Networks

Optimization – Trading Supply

Gas

## EDF main businesses

Generation

Networks - Transmission & Distribution

Overview

Distribution

Transmission



**RTE is no longer fully consolidated since 31 December 2010, but accounted for under the equity method**

## Key expertise in networks

### ■ Electricity transmission

- France: via RTE, with 105,000 km of lines and more than 2,600 substations and 46 cross-border lines
- Engineering projects outside France lead by EDF SA, in Vietnam and Senegal

### ■ Electricity distribution

- France: via ERDF, Electricité de Strasbourg, EDF IES (in France), with ~1.3 million km of lines
- Hungary and Slovakia: through Group subsidiaries which own high, medium and low voltage grids
- Increasing use of delegated management partnerships (e.g. agreement signed with the Russian power distributor MRSK and with the Chinese State Grid)
- Business model evolving to take into account various new decentralized generation solutions and allow consumers to manage their consumption more closely
  - ➔ smart grids (300,000 smart meters currently being tested in France – “Linky” project)

# The network tariff in France: the TURPE

- Multi-year predefined tariffs giving visibility (over 4 years until 31 July 2013 for the TURPE 3)
- General principle is to cover costs and to give a return on capital invested: mainly "cost +" type regulation
- Rate of return is computed on Regulated Asset Base (RAB) at a nominal pre-tax rate equal to 7.25% (for T & D)
- A regulatory account, the "Compte de Régulation des Charges et des Produits" (income and expenditure adjustment account), measures and compensates ex-post, differences between actual outcomes and forecast on specific items. "CRCP" in particular prevents ERDF and RTE from facing any volume risk.
- Evolutions between TURPE 2 and TURPE 3
  - Extension of CRCP scope and annual indexing
  - Implementation of an incentive regulation system (bonus/malus) on 4 items : manageable costs, quality of supply, quality of service management (distribution), network loss purchase



## TURPE 3 tariff yearly indexation

- Yearly indexation (CPI- X+ K). Tariff is adjusted each year on the implementation date of TURPE 3

### Transmission :

- 2.79% increase on 1 August 2012 ( CPI= +2.29%, -X = +0.4% and K= +0.1%)
- 2% increase on 1 Aug 2009 versus TURPE 2, 2.5% as of 1 August 2010 and 2.56% on 1 August 2011
- Annual indexing on 1 August based on the formula:  $CPI - X + K$ 
  - CPI = consumer price index of Year N-1
  - -X = 0.4% (cost factor: tariff-based costs evolve faster than inflation)
  - K = CRCP reconciliation term

### Distribution:

- 1.80% increase on 1 August 2012 ( CPI= +2.29%, -X = +1.3% and K= -1.79%)
- 3.4% increase on 1 August 2010 then 3.94% as of 1 August 2011
- Annual indexing on 1 August based on the formula:  $CPI - X + K$ 
  - CPI = consumer price index of Year N-1
  - -X = 1.3% (cost factor: tariff-based costs evolve faster than inflation)
  - K = CRCP reconciliation term

# Regulated asset bases in France



Electricity

## RAB end of 2011

## WACC

## Indexation

Transport NBV <sup>(1)</sup> = €11.4bn

7.25%

nominal before taxes

IPC+0.4%+CRCP

2.56% as at 1 August 2011

Distribution NBV <sup>(1)</sup> = €34.0bn  
Replacement value = €135bn

7.25%

nominal before taxes

IPC+1.3%+CRCP

3.94% as at 1 August 2011

<sup>(1)</sup> NBV = Net Book Value

## ERDF – Smart Grids project

### Project for the creation of a the future smart distribution network

- An evolution step by step, the first one being the implementation of smart meters (Linky Project)
  - Further steps tested through experimentation programs
- What are the main experimental project?
  - ERDF is the pilot of European GRID4U demonstrator, including the Nicegrid part in Nice
  - 10 others projects through France with industrial partners
- Benefits expected
  - Increased flexibility of networks
    - >> better detection of faults and repairs, better integration of green energy (solar and wind) & electric cars
  - Improvement in Group performance (load management, new services)

The total investment for the experimental period will be about 0,4bn€

## ERDF – Linky Project

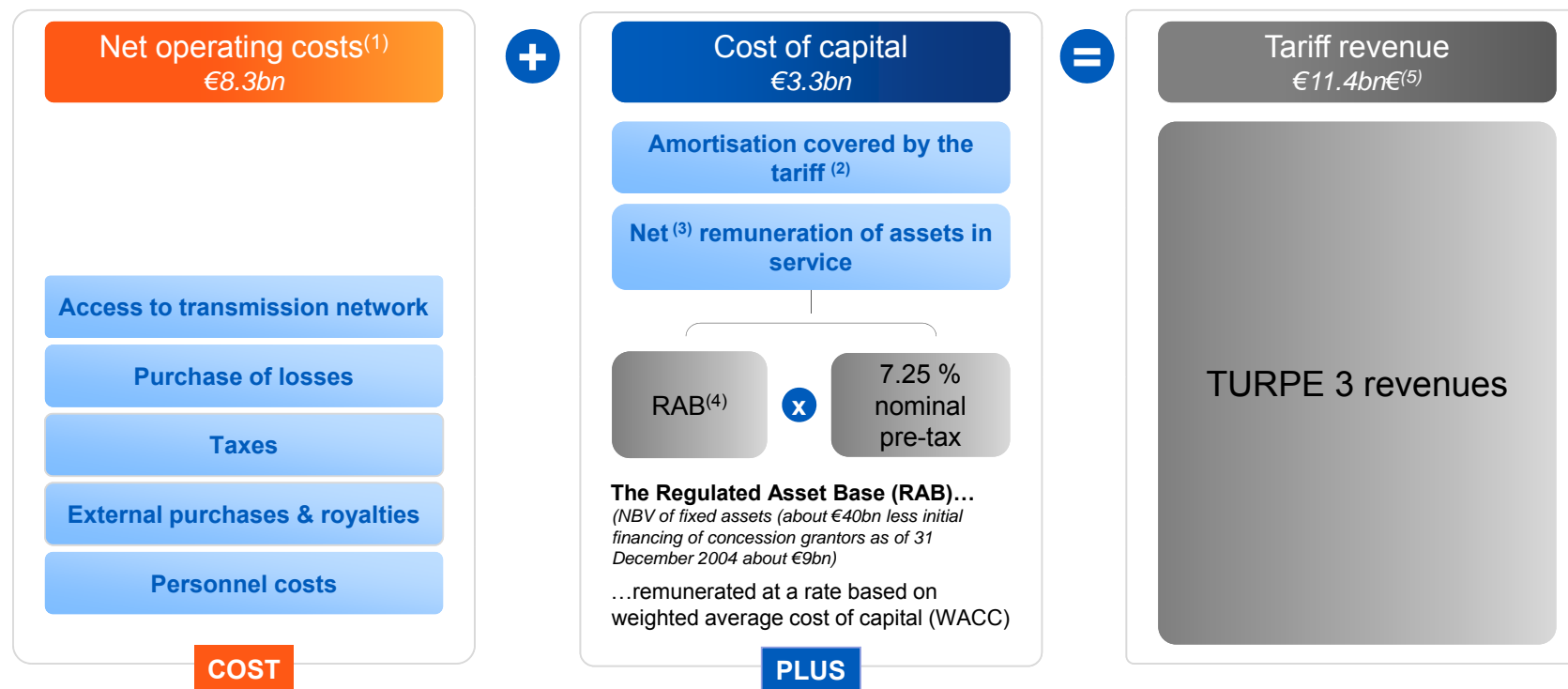
**Project for the creation of a smart metering system: replacement of 35 million meters in France**

- A successful experiment with almost 300,000 meters
  - CRE decision to implement smart meters : June 2011
- What comes next?
  - Secure financing
- Benefits expected
  - Improvement in customer service
    - >> remote operations, real-time billing, information, faster repairs
  - A key link in the networks of the future
    - >> smart grids: integration of LV renewable, electrical vehicles, ...
  - Improvement in Group performance (lower management costs, fewer on-site visits, reduction in non-technical losses)

The total investment for the roll out period will be about €4.5bn

# TURPE 3 rates: average amounts set for 2009-2013

- Tariffs are set on a “cost +” basis in the following manner:



(Amounts derived from the TURPE 3 tariff decision – average for the tariff period from 1 August 2009 to 1 August 2013)

(1) Net of non-delivery revenues

(2) Do not include amortization of historical contributions.

(3) Net of external financing included in RAB (cf. next page)

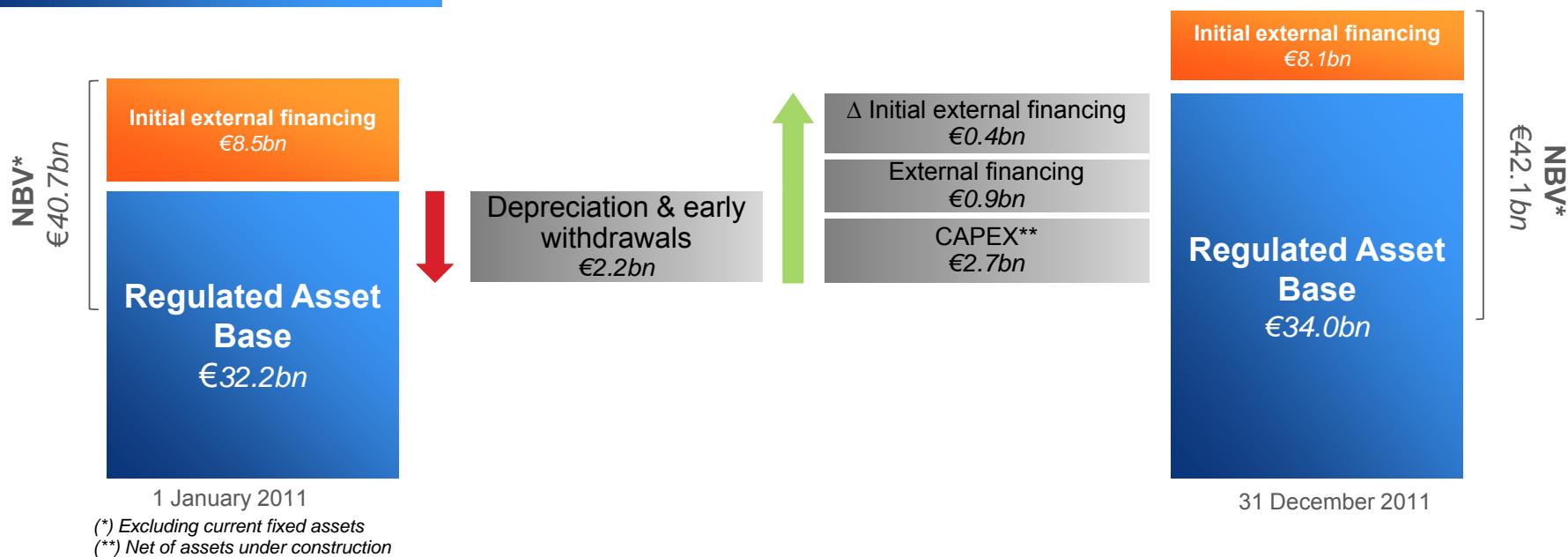
(4) The Regulated Asset Base excludes fixed assets in progress and working capital requirement from its scope and is decreased by the historical contributions.

(5) The CRCP (adjustment account for income and costs) of the previous tariff period (€0.2bn/year) is subtracted from the average tariff revenue during the TURPE 3 tariff period (€11.6bn/year)

# Distribution Regulation – RAB evolution

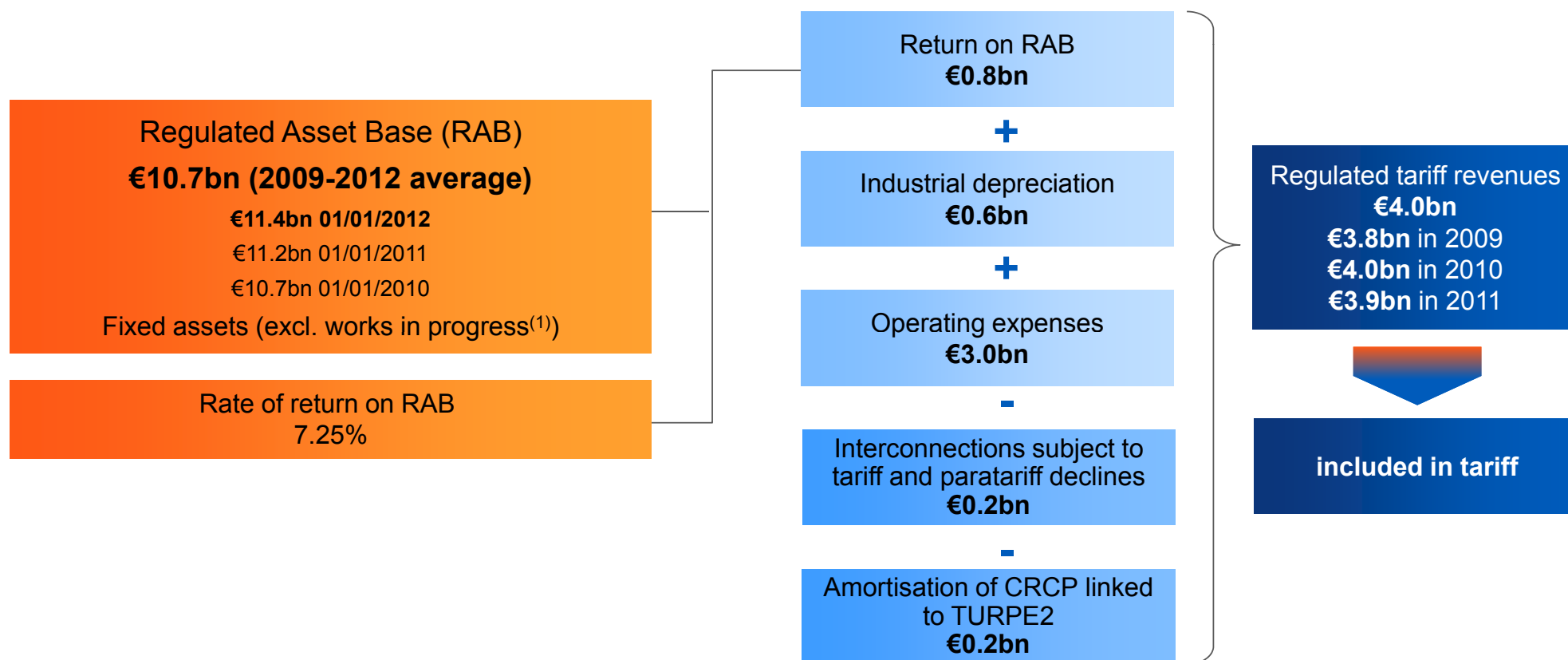
- The Regulated Asset Base depends on:
  - Industrial depreciation of fixed assets, which lowers value of RAB
  - ERDF investments (CAPEX) and assets granted to concession grantors and third parties (external financing)

## Annual evolution of RAB



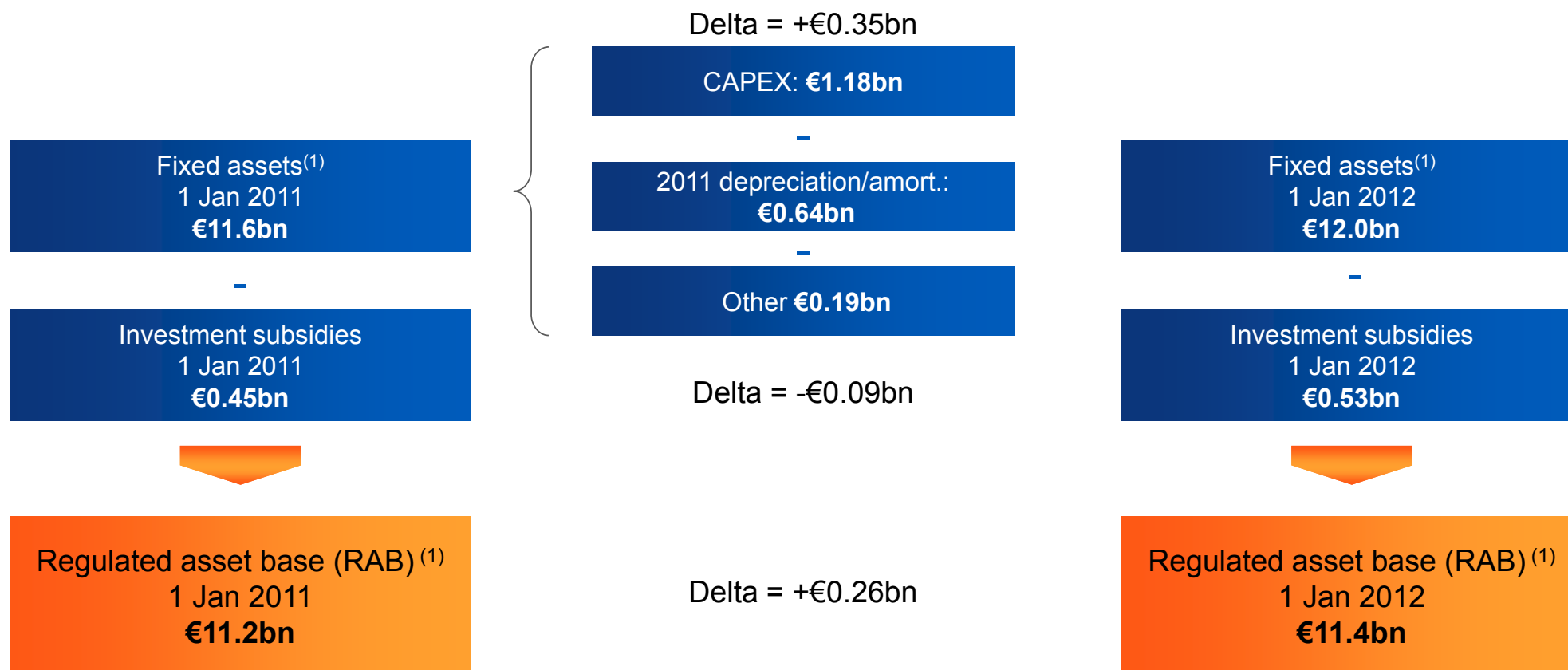
# Transmission Regulation

## Determination of average TURPE 3 over the 2009-2013 tariff period





# Transmission Regulation - Change in RAB





## EDF main businesses

Generation

Networks - Transmission & Distribution

Optimization - Trading - Supply

Optimization principles

Optimization at EDF in France

Supply in France

# Optimisation and Trading: leveraging the value chain

- **Main role of the optimizer:** ensure that the upstream resources are managed in a way that meet the commitments to the customers downstream (and other counterparties), while minimizing the cost of supply and maintaining an accurate representation of the downstream portfolio to ensure that the gross margin is maximized within a level of risk limited by the Group risk management policy:
  - upstream resources: generation facilities, long-term electricity purchasing contracts, bilateral purchasing agreements, purchases on wholesale markets, obligations to purchase from decentralized producers
  - downstream commitments: long-term supply contract, bilateral sales agreements, sales to end users, sales on wholesale markets
- **The optimizer looks after costs, manages stocks, and transacts (through EDF Trading) on the wholesale markets**
- The supply-demand balance is forecast over the different time horizons
- The upstream/downstream balance must be simulated at regular intervals, as there are many fluctuations and uncertainties

## Did you know?

EDF Trading is one of the most important energy traders in Europe and has strong positions in the US

## Trading figures for 2010:

3,957 TWh of electricity  
556 MBTU of gas  
495 MT of coal  
317 Mt of CO<sub>2</sub>

# Optimization-trading within the Group: towards full integration

	France	United Kingdom	Central and Eastern Europe	Belgium
Power				
Short-term assets optimisation	●	●	●	●
Flexibility on forward markets	●	●	●	●
Coal	●	●	●	NA
Gas	●	●	NA	●
CO <sub>2</sub> /biomass	●	●	●	●

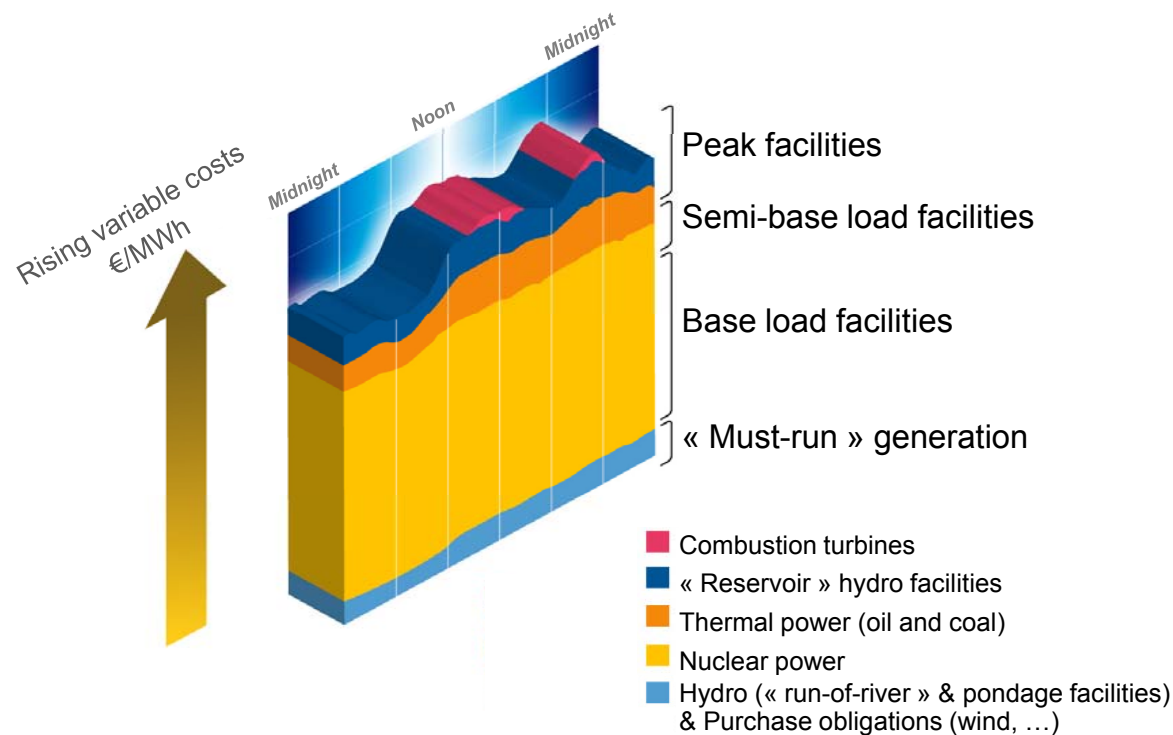
- Completed
- In progress (set for completion by the end of 2012)
- Scheduled by 2015

# Cost optimisation

## Scheduling of generation facilities based on variable costs

### Stack chart of generation facilities

Example of one high consumption day in winter



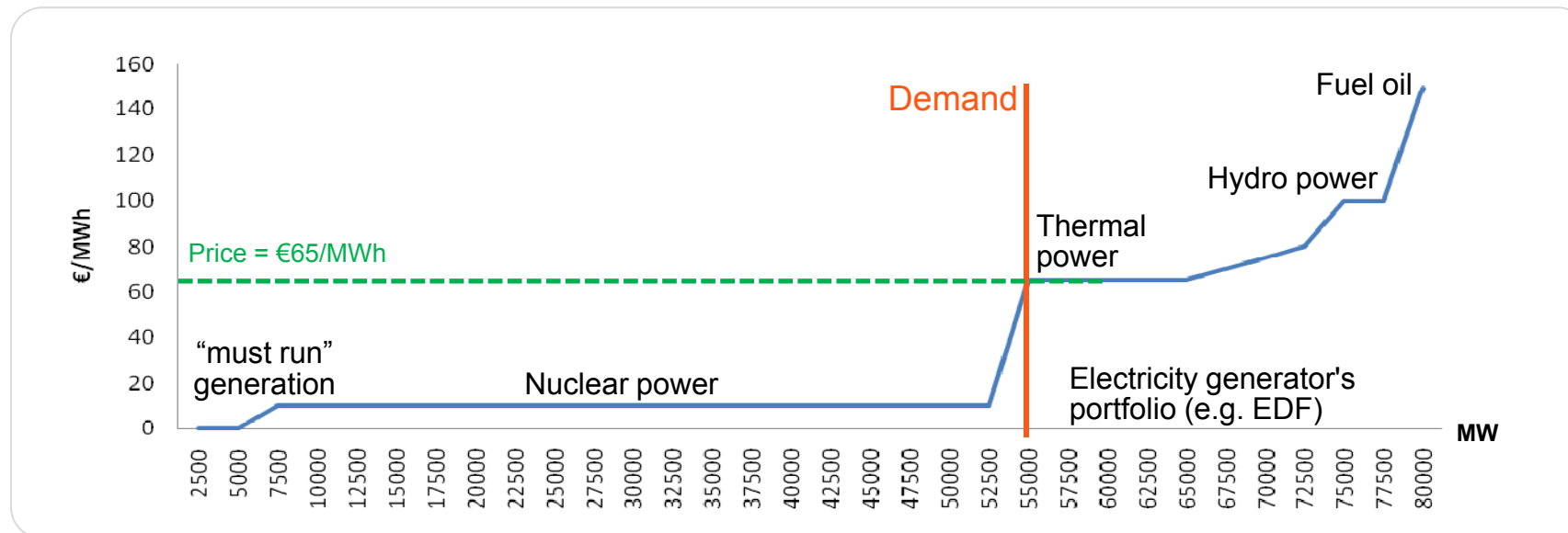
- The optimiser schedules the operation of generation facilities, ranking according to their merit order until the estimated demand is met.

### Did you know?

The merit order is a way of ranking available sources of energy, especially electrical generation, in ascending order of their short-run marginal costs of generation, so that those with the lowest marginal costs are the first ones to be brought online to meet demand, and the plants with the highest marginal costs are the last to be brought on line

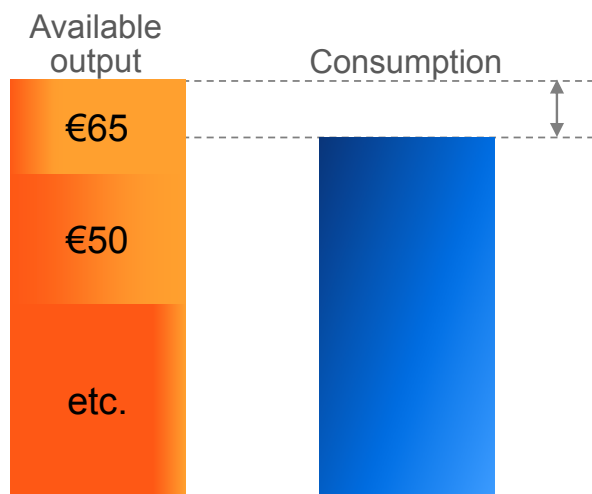
## Daily optimisation: preliminary optimisation by each producer

- Before the market, each producer determines the resources required to meet a given level of demand
- It classifies its available generation facilities from the least expensive to the most expensive
- It then determines the marginal cost of purchases/sales on the market to meet the supply-demand balance of its own portfolio:



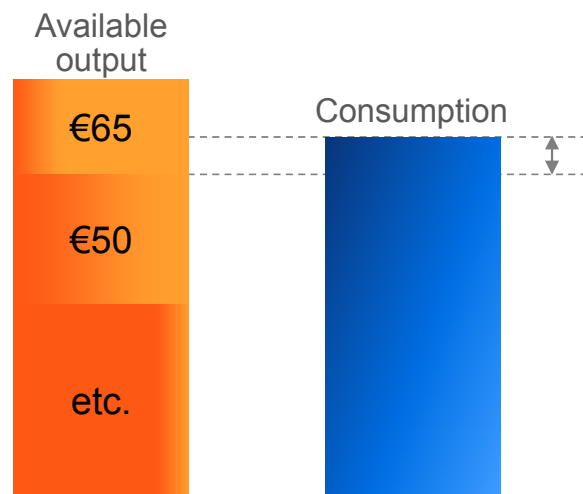
## Continuous adjustments with the wholesale market

- The optimiser then compares its marginal generation cost with the market price. This is used to determine a buy/sell strategy:

**Case N° 1**

Market price = €100/MWh

→ Output sold on the market

**Case N° 2**

Market price = €60/MWh

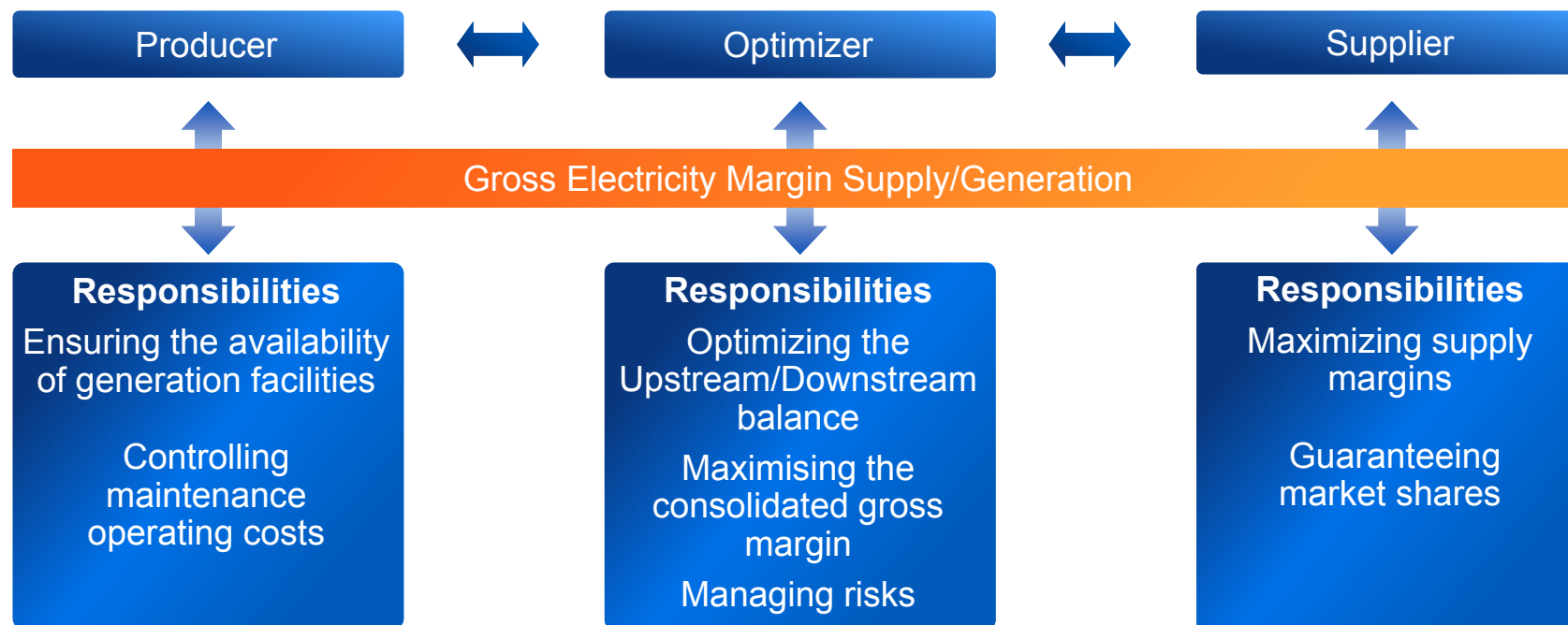
→ Purchase from market up to cost of substitution (€65/MWh)

OPTIMISATION with EDF Trading

# Maximising the consolidated gross margin

## ■ Structural diagram:

- The objective is to make the Producer, the Optimizer and the Supplier responsible for their own activities within an explicit mandate.
- There is a joint objective, to maximize the gross margin, driven primarily by the Optimizer





## Optimizer's interactions with the supplier and producer

- The producer undertakes to provide the optimizer with:
  - Its best estimate of the availability of generation facilities
  - Complete transparency on its constraints and costs
- The supplier undertakes to provide the optimizer with:
  - Its best estimate of the development of its customer portfolio and volumes consumed by its customers
  - Full transparency on products sold to its clients, including embedded optionalities with the associated risks
- The optimizer undertakes to provide the producer and supplier with:
  - Economic signals so that each entity will manage their portfolios in order to maximize the gross margin

## The upstream/downstream balance is fairly volatile over different time periods

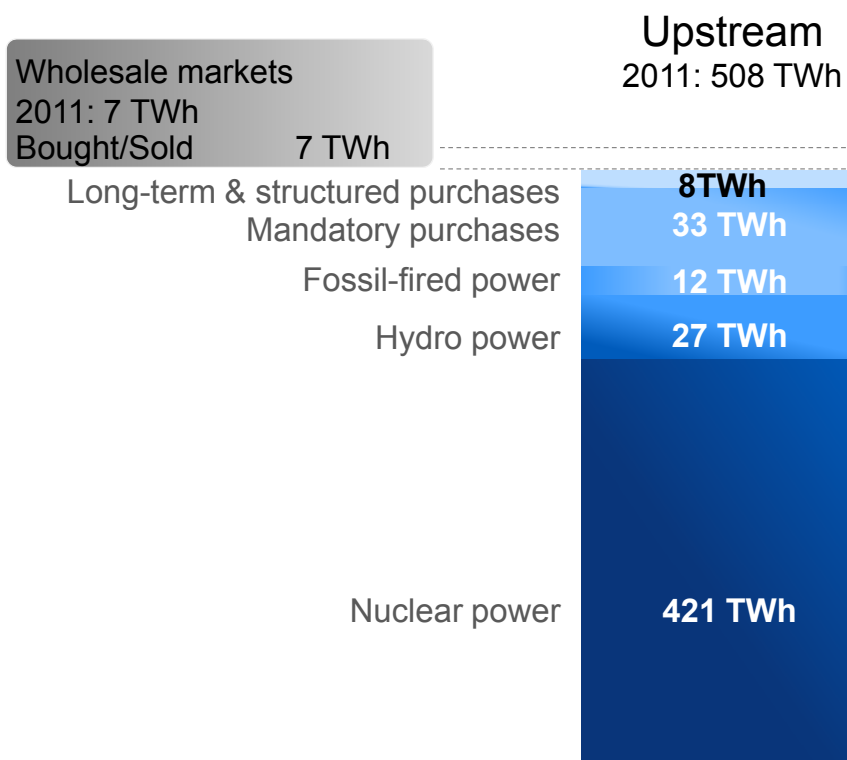
- Thermo-sensitivity of consumption: temperature has a strong influence on demand: in winter, one degree less equals to 2,300 MW of higher consumption in France
- Variations in water levels → major variation in generation potential from year to year (typically 10 to 15 TWh between a dry year and a rainy year)
- Unplanned unavailability of generation facilities (nuclear power, fossil-fired power, ...)
- Mandatory purchases from smaller producers (decentralised): strong fluctuation in contribution of renewable energies (up to 4,000 MW from one day to another on the French wind power generation)
- Sales on the wholesale markets: optionalities at the hand of our counterparties

## Use of the wholesale market

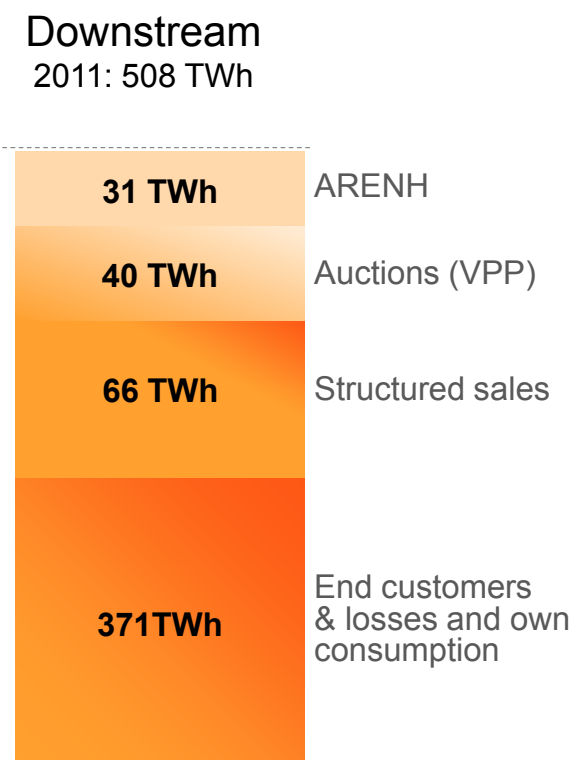
- The optimizer balances the difference by transacting on the wholesale market, either when there is a difference between the sum of the upstream and downstream positions, or when profitable arbitrage opportunities arise
- It is possible to transact different products over different time periods
  - Medium term: purchases or sales of annual products for the year  $N+1/N+2/N+3$
  - Short term: same principle with purchases/sales today for the next day (spot) or over the next few hours of the day
  - Intermediate products (quarterly products over two to three coming quarters and weekly products over two to three coming weeks) also exist
- The optimizer can directly contact its potential counterparties or go through the organized markets
  - OTC (over the counter) bilateral agreement: direct trade with counterparty
  - Regulated exchanges: pooling of supply and demand by a market organizer and settlement of trades (Epexspot in France, Belpex in Belgium, etc.)
- The optimizer for France accesses the market exclusively via EDF Trading

## France: 2011 upstream/downstream balance (excl. French Islands business)

### Output/Purchases



### Sales



(1) VPP: capacity auctions resulting from a commitment by EDF to the European Union in the context of EDF's acquisition of EnBW shares, to encourage competition on the French market

## EDF's 2011 electricity business in France

### Sales to end customers

**Companies and professionals**  
(out of historic tariff)

**61.3 TWh**

Of which TaRTAM:

**15.3 TWh**

**Companies and professionals**  
(at historic tariff)

**169.9 TWh**

**Residential  
customers**

**132.4 TWh**

**Eurodif**

**7 TWh**

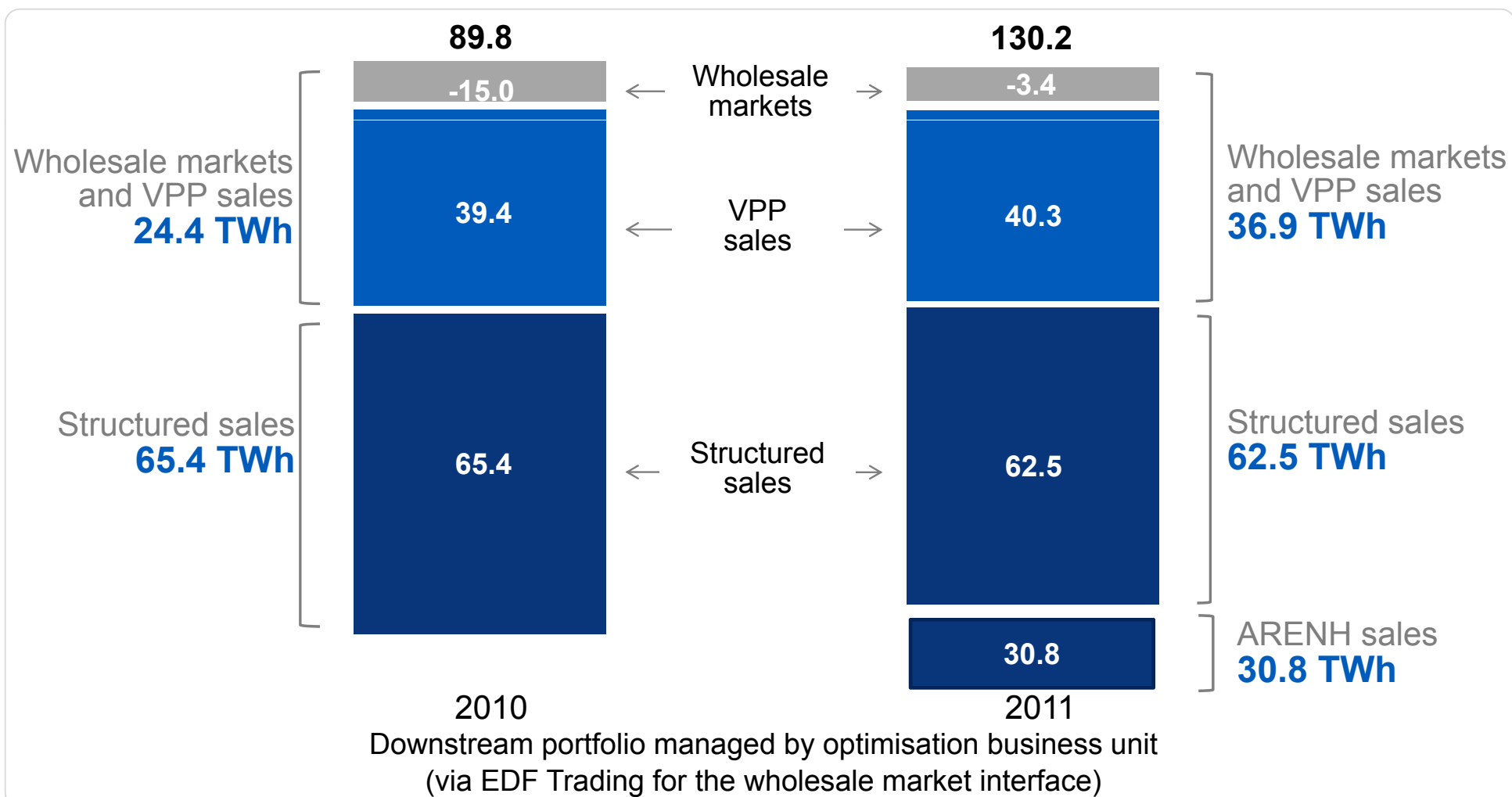
**17.1 TWh**  
ELD transfer price

**81.1 TWh**  
Green tariff

**37.8 TWh**  
Yellow tariff

**166.3 TWh**  
Blue tariff

## EDF's downstream portfolio - 2011



## Regulated tariffs in France

- The tariff structure includes a range of regulated electricity tariffs, depending on the type of consumers (blue for residential and small professionals, yellow and green for companies)
- Changes in tariffs are determined by the Economy and Energy ministers, after consultation with the CRE (Commission for the Regulation of Electricity)
- The tariff is called an “integrated” tariff as it covers all the following elements
  - The supply portion (approx. 60% excl. taxes for residential customers), which can be split into the “energy” portion based on generation costs and into “commercial” costs (client management and marketing)
  - The network portion (approx. 40% excl. taxes for residential customers), including the cost of using the public transmission network operated by RTE and the public distribution network operated by distribution network operators (95% of volume distributed by ErDF). The network cost portion is based on the tariff for use of the public electricity transmission and distribution networks (TURPE)
- Since 1 July 2007, all customers in France can freely exit the regulated tariff structure

## Change in tariffs in France

	2005	2006	2007	2008	2009	2010	2011
Inflation ( <i>July N / July N-1</i> )	1.6%	2.0%	1.1%	3.6%	-0.7%	1.6%	2.1%
Average	0%	1.7%	1.2%	3.6%	2.7%	3.8%	2.2%
<i>o/w:</i>							
Blue	0%	1.7%	1.1%	2.0%	1.9%	3.2%	1.7%
Yellow	0%	1.7%	1.5%	6.0%	4.0%	4.5%	3.2%
Green	0%	1.7%	1.5%	8.0%	5.0%	5.5%	3.2%
TaRTAM			1.5%	8.0%	0%	0.6%	-
Increase incl. TaRTAM			1.3%	4.1%	2.3%	3.4%	-
Non-nationalised distributors		0%	0%	0.8%	5.6%	10.0%	1.3%



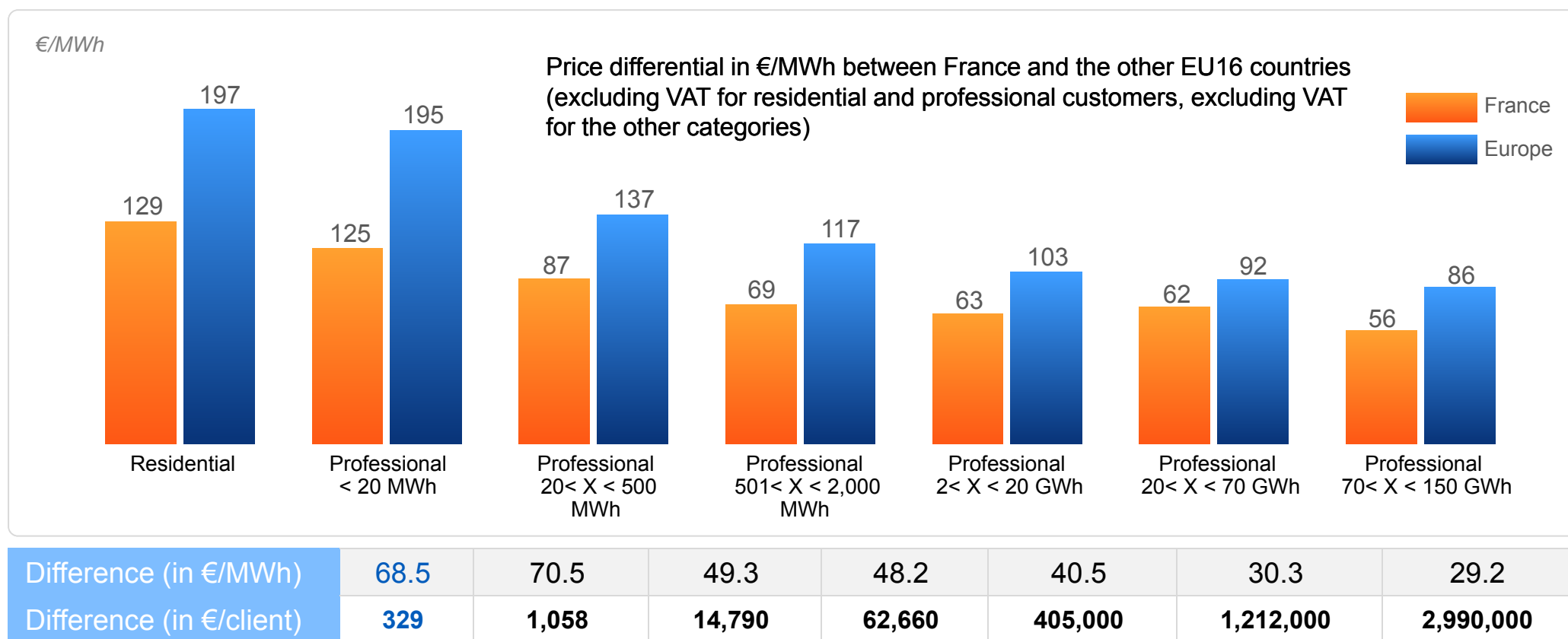
# ARENH implementation within the NOME law framework

		2011	2012
Price (in €/MWh)	1 <sup>st</sup> half	N/A	42
	2 <sup>nd</sup> half	40	-
Maximum volume (in TWh)			100 <sup>(1)</sup>
Allocated volumes (in TWh)	1 <sup>st</sup> half		~30
	2 <sup>nd</sup> half	~30	~31

source CRE

- Competitors make their requests on the basis of sales projections, as they can only request a n ARENH volume backed by the demand of their final customers
- The margin generated on a possible over-allocation of ARENH (i.e. sales projections above the year's actual sales) will be given back to EDF in July of N+1
- Beyond a 20% difference (for the first window, then 10 %), a penalty is applied by the regulator

# Impact of ARENH on tariffs in France: their competitiveness will not be undermined



EDF main businesses

Generation

Networks

Optimization – Trading Supply

Gas

## EDF main businesses

Generation

Networks - Transmission & Distribution

Optimization - Trading Supply

Gas

Inputs on gas sector (European focus)

EDF strategy

Key highlights on EDF gas business

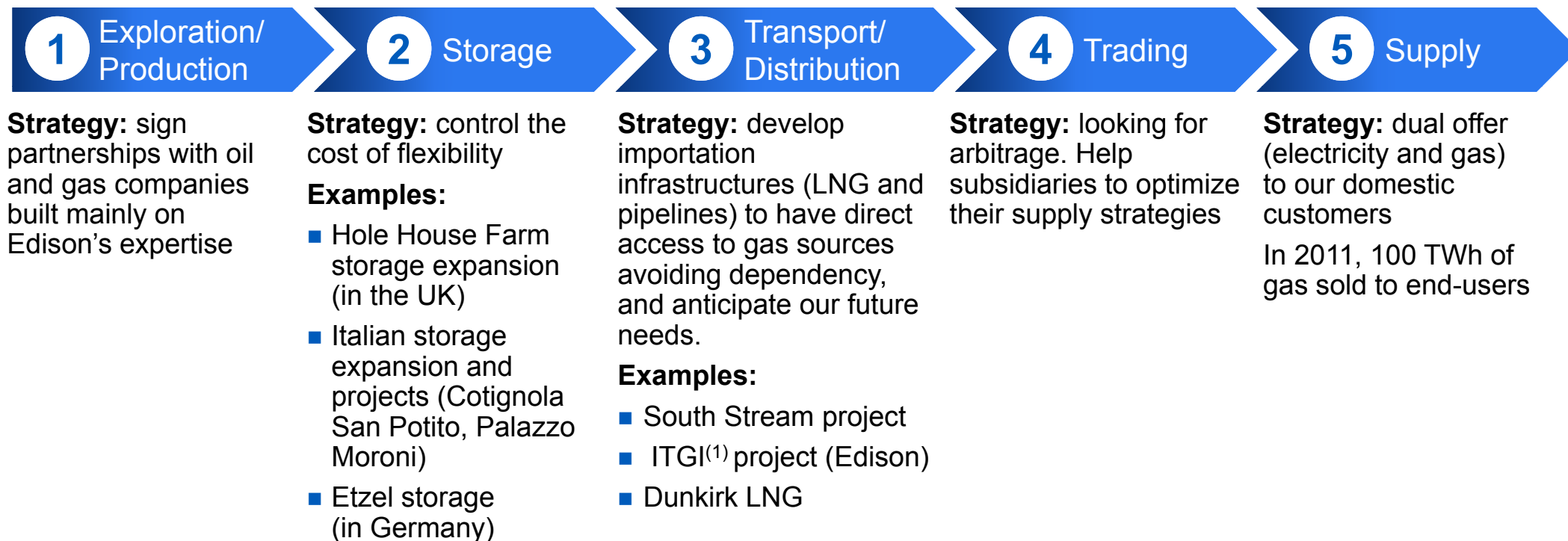
## The growing importance of gas

- Uncertainty on the demand side: role of gas in decarbonization of European economies
  - Gas-fired plants do emit far less CO<sub>2</sub> than coal-fired plants
  - This upward pressure on gas consumption is currently moderated by the economic difficulties, especially in Europe
  - Long-term trend will therefore depend primarily on economic parameters and implementation of European Energy policies (renewable energy, greenhouse gas emissions, energy efficiency...) but should be moderate until 2030 and probably decrease from 2030 to 2050
  - But whatever the consumption scenario in Europe may be, given current depletion of European reserves, Europe will rely more and more on imports in the future. This emphasizes the importance for energy companies to have access to gas infrastructures
- Uncertainty on the supply side
  - Indigenous gas production of European countries (UK, Netherlands) will continue to decline.
  - Shale gas in the US has been a game changer for the demand-supply balance triggering a drastic reduction in LNG imports. But Europe has more limited shale gas reserves, which are also likely to be more difficult to extract and expensive to produce.
  - In addition, some European countries implemented moratorium on unconventional gas development and others face environmental issues.
  - Therefore Europe will have to rely on more pipeline and LNG supply for its growing import requirements.
  - However the growing consumption of emerging countries in other regional gas markets brings the risk of enhanced competition for the gas resource
  - Hence, access to reliable gas sourcing in the future will be key for energy groups

Did you know?

**Rule-of-thumb:**  
gas-fired plants emit  
approx. 3 times  
less CO<sub>2</sub> than coal-  
fired plants

## EDF's gas strategy along the gas value chain



### GAS STRATEGY IN A NUTSHELL:

- Offer a dual offer electricity/gas to final customers
- Supply EDF's gas-fired power plants worldwide
- Benefit from arbitrage opportunities

# Natural gas end markets for EDF

## End consumers:

### ■ Group's gas sales in 2011: ~100 TWh

- France: ~ 713,000 residential and key accounts customers<sup>(1)</sup> (~ 18 TWh), ~ 3.7% market share
- Italy: ~524,000 customers (~40TWh)
- UK: ~1.9 M customers (~26 TWh), ~5.1% market share
- Belgium: ~540,000 customers (~16 TWh), ~12.5% market share

### ■ Electricity generation

- Growing role of gas in electricity generation, because of lower CO<sub>2</sub> emissions, relatively low investment costs and construction lead time, and high flexibility
- At the end of 2011, EDF had approx.11 GW of gas fired assets (combustion turbines, cogeneration power plants, CCGTs) in France (557 MW), Italy (6.5 GW<sup>(2)</sup>), the UK (819 MW), Belgium (1.15 GW) and the Netherlands (435 MW)
- In Q4 2011, power generation from the 430 MW CCGT in Blénod-lès-Pont-à-Mousson started
- Additional CCGTs are currently under construction in France (2x465 MW), in the UK (1x1,305 MW), and under development in Belgium (2x890MW +1x920MW).

(1) in 2012, gas customers portfolio in France will be enhanced due to the acquisition of Enerest by Electricité de Strasbourg, a 100% EDF subsidiary, in November 2011. Enerest is a leading gas distribution company in the region of Strasbourg.

(2) Before sale of Edipower stake in 2012 ; in addition, EDISON holds a 50% stake in Elpedison, which operates two CCGT in Greece (810 MW)

# Edison's hydrocarbons activities

## Exploration & Production (E&P)

- Strong position, mainly as an operator:  
Italy, Egypt, Norway
- Significant growth potential through exploration in core zones and to a lesser extent in new zones
  - Successful reserves replacement of 143% in the 5 past years
  - E & P engineering track record with operator experience in expansion zones.
- Hydrocarbon reserves as at end-2011: 49.8 Bcm
- 2011 gas production: 2.2 Bcm
- 2011 crude oil production: 3.5 MBoe

Exploration: a fundamental axis of the growth strategy of Edison in E&P



Current zones



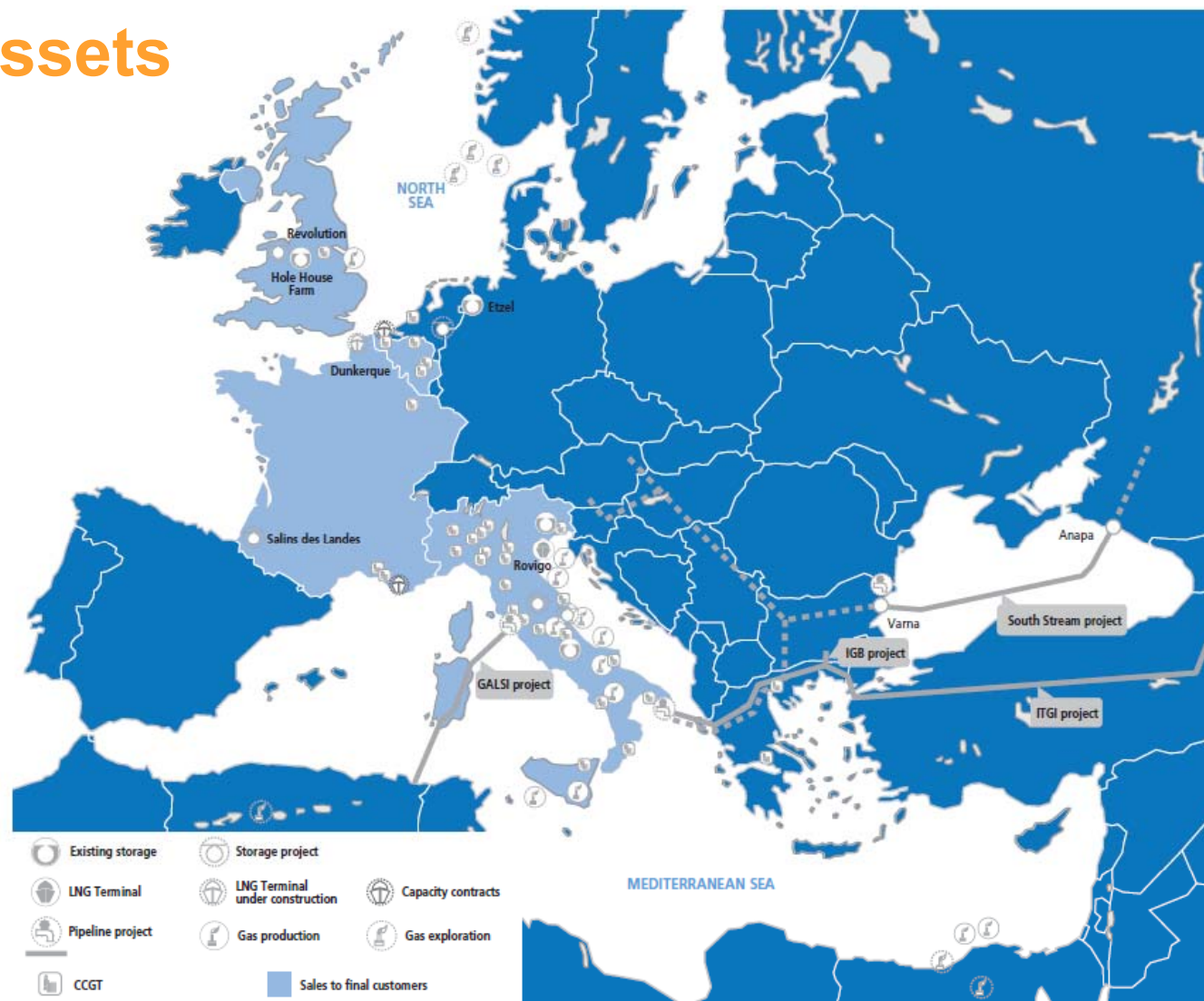
Expansion zones

## Focus on Dunkirk LNG (Liquefied Natural Gas) project

- The Dunkirk LNG (Liquefied Natural Gas) receiving terminal, in operation in 2015, will be made up of the following installations:
  - An entry point for around 120 methane tankers a year for a capacity of 13 bcm per year
  - A liquefied natural gas (LNG) unloading system
  - Three LNG storage tanks holding 190,000 m<sup>3</sup> (each tank is around 50m high and 90 m in diameter)
  - A regasification unit (from -160°C to 0°C)
  - A sea water intake for heating the LNG. For this project, part of the cooling waters from the nearby Gravelines nuclear plant will be used to reheat the LNG
  - Connection to the French gas transport network, and potentially to the Belgian one
- Three project managers will be involved in the project:
  - The Grand Port Maritime of Dunkirk will build the port infrastructure consisting of a dock, unloading platform and a platform for the industrial infrastructure covering around 50 hectares partly reclaimed from the sea
  - EDF will, via its subsidiary Dunkirk LNG (65% EDF, 25% Fluxys, 10% Total), build the industrial infrastructure for unloading, storage and regasification of LNG as well as the roadways and facilities needed for the terminal's operations (totaling €1bn)
  - GRTgaz will lay down the pipes that will carry the revaporised gas to the gas transport networks
- Overall terminal capacity will be 13 Gm<sup>3</sup>/year, representing 20% of France LNG imports capacities. EDF will be one of the main users, with other partners such as Total



# EDF's key gas assets and projects in Europe<sup>(1)</sup>



# Year 2011

# Facts & Figures



**EDF within the energy sector  
and derived strategy**



The EDF Group

EDF main businesses

**EDF within the energy sector  
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## EDF within the energy sector and derived strategy

Key facts on the energy sector

Challenges of the energy sector

EDF is well-positioned to tackle these challenges

Strategy

## Energy key figures

- **~4,000 M tons of oil** consumed worldwide, approx.  
half in OECD countries, half in non-OECD countries
- **~3,200 bcm of gas** consumed worldwide , approx.  
half in OECD countries, half in non-OECD countries
- **~7,270 M tons of coal** consumed worldwide, approx.  
1/3 in OECD countries, 2/3 in non-OECD countries
- **~21,000 TWh of electricity** generated worldwide,  
half in OECD countries, half in non-OECD countries

Did you know?

### Energy is a quantity.

There are a lot of units to quantify energy. The international standard of energy measurement is the Joule (J). However, there are many other units used, according to industry practices (the watthour (Wh) for electricity companies, the ton of oil equivalent (toe) in the oil industry etc...)

### Main units include

1 kwh = 3.6 MJ

1 toe = 41.868 GJ

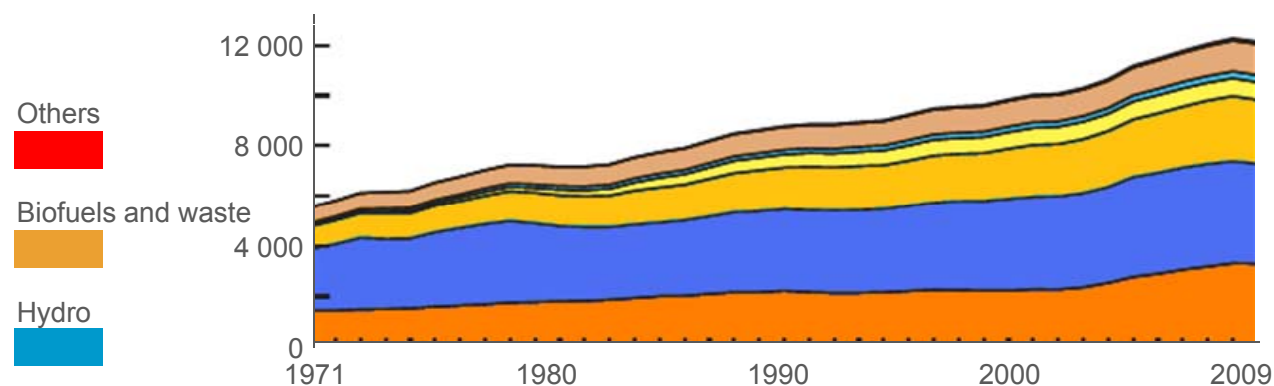
1 cal = 4.18 J

1 btu (British thermal Unit) = 1055.1 J

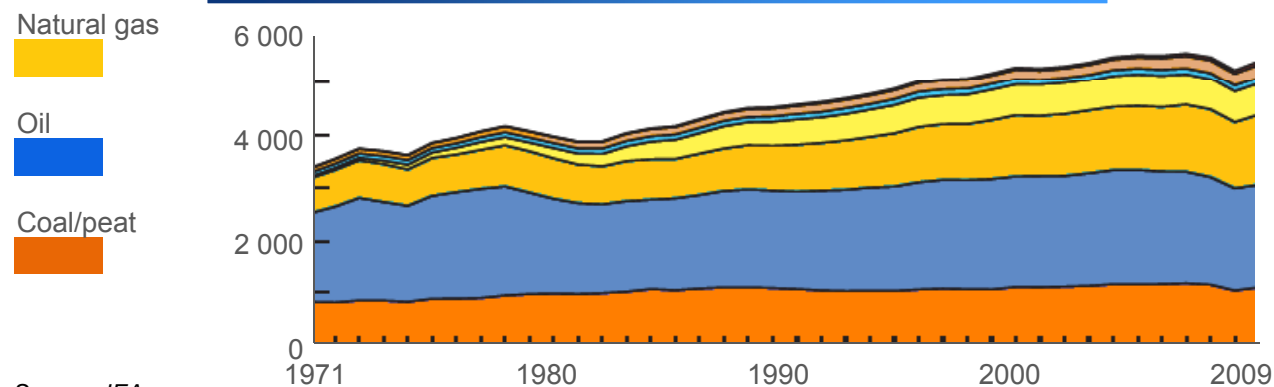
1 cm (cubic metre of natural gas) = 39 MJ

# Total primary energy supply since 1971 (in Mtoe)

World total primary energy supply from 1971 to 2009



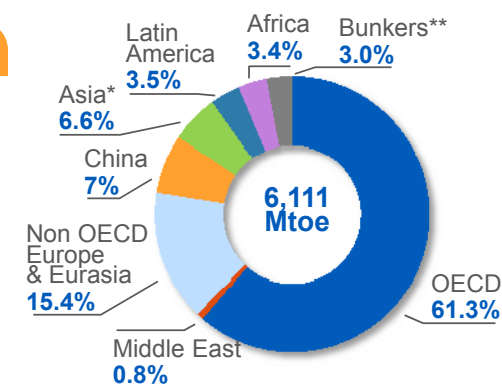
OECD total primary energy supply from 1971 to 2010



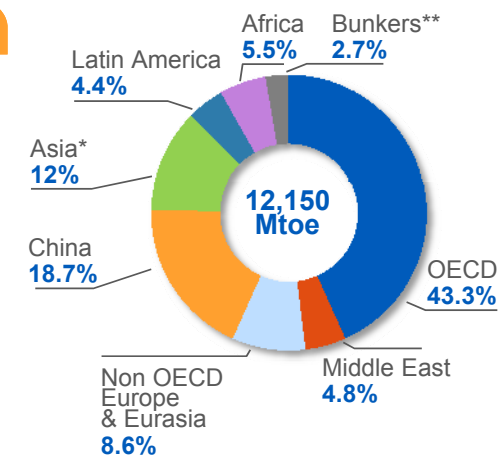
Sources IEA

World total primary energy by geography

1973



2009



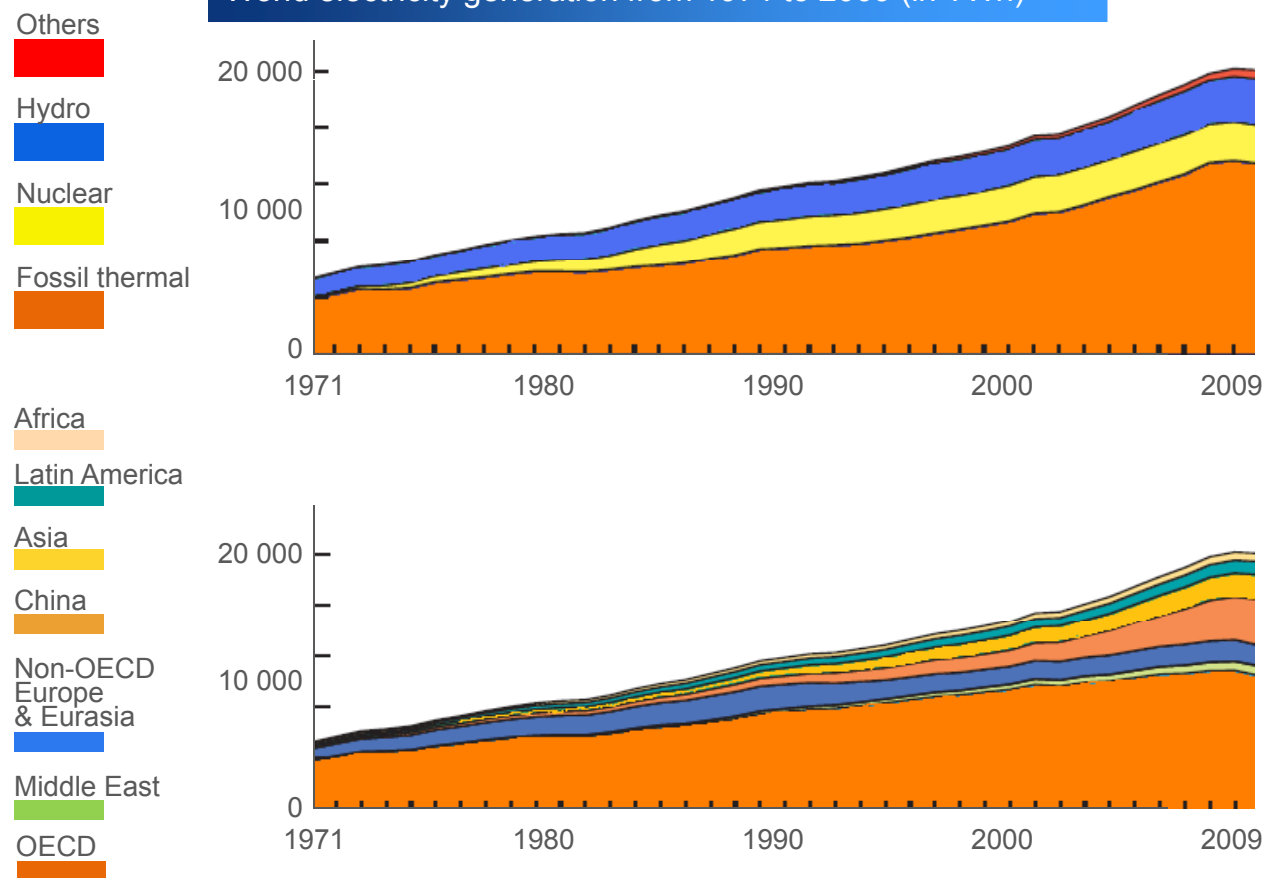
Sources IEA

\* Asia excludes China \*\* includes international aviation and international marine bunkers



# Electricity generation by fuel

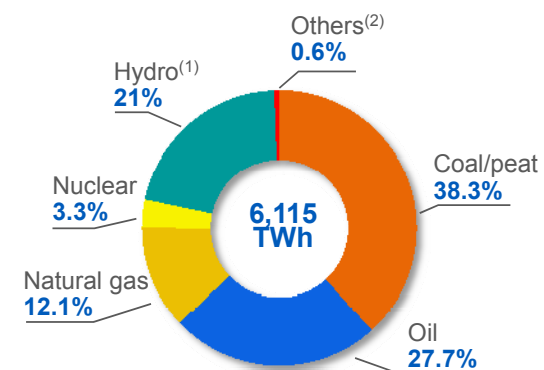
World electricity generation from 1971 to 2009 (in TWh)



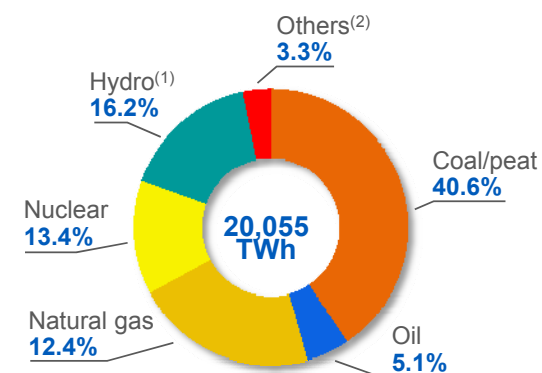
Sources IEA

1973 and 2009 fuel shares of electricity generation

1973



2009



Sources IEA

<sup>(1)</sup>Excludes pumped storage <sup>(2)</sup>Other includes geothermal, solar, biofuels and waste and heat

# A sector facing a complex regulatory framework - main regulations impacting EDF (1/3)

## France

### ■ Market Structure - French electricity market transformed by the NOME Law:

- ARENH promotes an access to competitors to baseload power produced by EDF existing nuclear power plants depending upon end-customer consumption (up to max 100 TWh)
- Yellow and Green tariffs (I&C customers / 120 TWh) will disappear by 31 December 2015. Blue tariffs (residential and small business customers / 186 TWh) will continue
- Target of convergence of tariffs to ARENH level by 2015 at the latest
- Indexation formula expected, but timing uncertain
- Introduction of a mechanism, across market suppliers, to share the French power system's security of supply costs

### ■ Renewables - CSPE (Contribution to public electricity service):

- Set up pursuant to the Law of 10 February 2000 (now ,articles L121-6 and following of the Code of Energy) to allow EDF to offset certain expenses related to certain services of public interest
- Charged to end users via an "other services" line on their energy bill
- Collected by network operators and electricity suppliers

### ■ Supply - CEE (energy savings certificates)

- The mechanism of energy saving certificates, set up by the Law of 13 July 2005, and amended by the law of 12 July 2010 (now articles L221-1 to L221-11 of the Code of Energy), put energy saving obligations on energy suppliers, based on their energy sale volume. To fulfill their obligations, the companies have to produce energy saving certificates equivalent to the amount of energy savings they have to achieve or to purchase certificates from the other relevant parties of the mechanism.

# A sector facing a complex regulatory framework - main regulations impacting EDF (2/3)

## United Kingdom

### ■ RENEWABLES – ROCs

- Renewables Obligation (RO) is the current main mechanism for supporting large-scale generation of renewable electricity by placing an obligation on electricity suppliers to source a specified and annually increasing proportion of their electricity sales from renewable sources, or pay a penalty, the “buy out” price
- RO is administered by Ofgem\*, which issues Renewables Obligation Certificates (ROCs) to renewable electricity generators
- From April 2017, the RO will be replaced by a long-term feed-in tariff with contracts for difference (CfD)

### ■ GENERATION – Carbon floor

- Carbon price floor will be introduced in April 2013, as legislated for by the Finance Act 2011. It is a hybrid instrument linked to the ETS\*
- Fossil fuel supplies will be charged at the relevant carbon price support rate, reflecting the average carbon content of the fossil fuel
- The floor will begin at around £16/tCO<sub>2</sub> in 2013 and will follow a straight line trajectory to £30/tCO<sub>2</sub> in 2020 (all in 2009 prices)

### ■ GENERATION – “Contracts for difference”

- The CfD is a financial instrument that provides long term certainty to investors whilst protecting consumers from volatile commodity prices
- The terms of the contracts for baseload (nuclear) and intermittent plant (wind) will be different

### ■ THERMAL PLANTS – IED (Industrial Emissions Directive)

- IED recasts seven existing Directives relating to industrial emissions into a single coherent instrument
- Implementation is from 2016 and covers large combustion plants already in existence before 2013 and provides operators with 3 methods of compliance:
  - After 2016 – to install appropriate abatement equipment (i.e. Selective Catalytic Reduction)
  - Limited hours derogation (“opt-out”) of 17,500 hours with an end date of 31 December 2023
  - Transitional National Plan of 4.5 years to 30 June 2020. Implementation of a CO<sub>2</sub> emission cap for plants



# A sector facing a complex regulatory framework - main regulations impacting EDF (3/3)

## Italy

### ■ Robin Hood tax

- Already implemented for the oil industry, enlarged to electricity grid operators and renewable energy in August 2011

### ■ Renewables

- For wind energy, system of green certificates, to be replaced by feed-in tariffs by 2016 (for facilities commissioned before 2012, from 2011 for facilities commissioned after 2012)
- For solar energy, system of added-on subsidies on top of the electricity price (sort of feed-in tariffs)

## Belgium

### ■ Nuclear tax

- Implemented in 2008, €550M amount expected for 2011
- Legal phasing out of the older nuclear power plants by 2015 if no extension voted

### ■ Renewables

- System of green certificates to favour wind energy

## United States

EDF's businesses in the US are subject to regulation at both the federal and state levels, by multiple regulatory bodies. This include:

### ■ Nuclear

- Post-Fukushima: The NRC (US Nuclear Regulatory Commission) will published in March 2012 the new requirements for US nuclear plants
- Foreign Ownership Control and Influence: CENG and UniStar are subject to NRC restrictions on Foreign Ownership Control and Influence (FOCI)
- Department of Energy (DOE) loan guarantee program (see below in renewables section)

### ■ Environmental protection

- The US Environmental Protection Agency (EPA) is in the process of introducing **four major regulations impacting the power sector** (CSAPR, Air Toxics Rule, Coal Ash Rule, and Cooling Water Intake Structures Rule)

### ■ Renewables

- Renewable Portfolio Standards in 29 States and D.C. mandate a percentage of an electric provider's energy sales or installed capacity to come from renewable resources
- Production Tax Credit for wind projects, set to expire at end of December 2012 and Investment Tax Credit for solar projects until end of 2016
- Department of Energy (DOE) loan guarantee programs: one program authorizes the DOE to support innovative clean energy technologies (among other biomass, solar, wind/hydropower). Another temporary loan guarantee program was set in 2009 for projects started before 30 September 2011

### ■ Energy Trading

- **Dodd-Frank Wall Street Reform Act** implementation by the Commodity Futures Trading Commission will significantly impact commodities market participants and trading businesses

# Key challenges facing the electricity sector

## Strong growth in needs by 2035-2050

Worldwide population

**+2.3bn**

inhabitants by 2050

Electricity demand

**X 2**

in 2050, despite a better  
use of energy

Investment needs by 2035

**+ 4,000 GW**

To maintain the growth of non OECD  
countries

**+ 2,000 GW**

To renew capacities in OECD countries

## Security of supply

- Constraint on resources
- Growing cost of the energies
- Key role of networks

## Climate Change

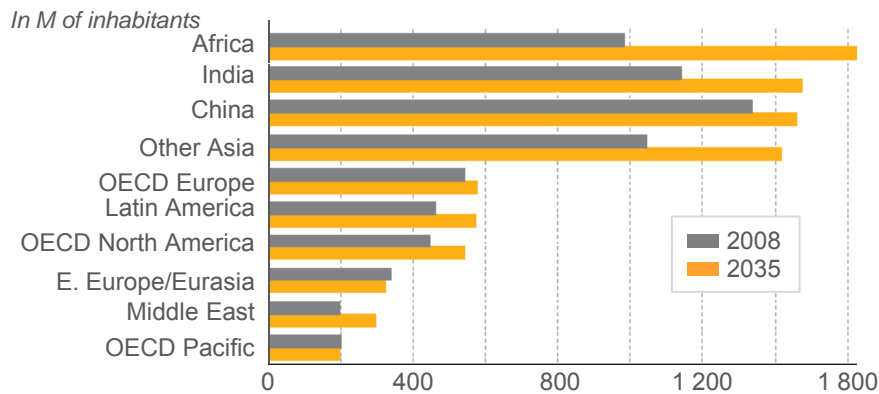
- A real climate challenge
- Important investments needed to mitigate climate effects. How sustainable in times of economic slowdown?
- How to reconcile climate and growth?

## Social welfare

- Importance of energy for the economic development and social welfare
- Hence, the importance of the competitiveness of energy to make it affordable to the greatest number of people

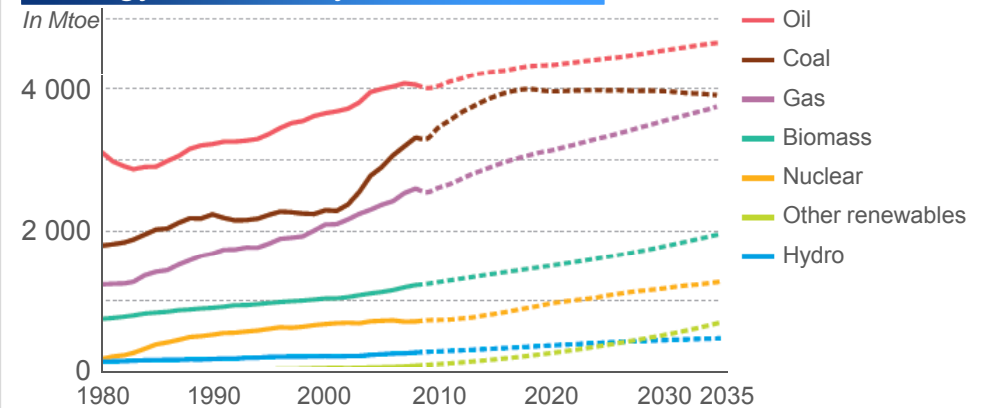
# Key challenges: higher demand, costlier resources

## Population by major region



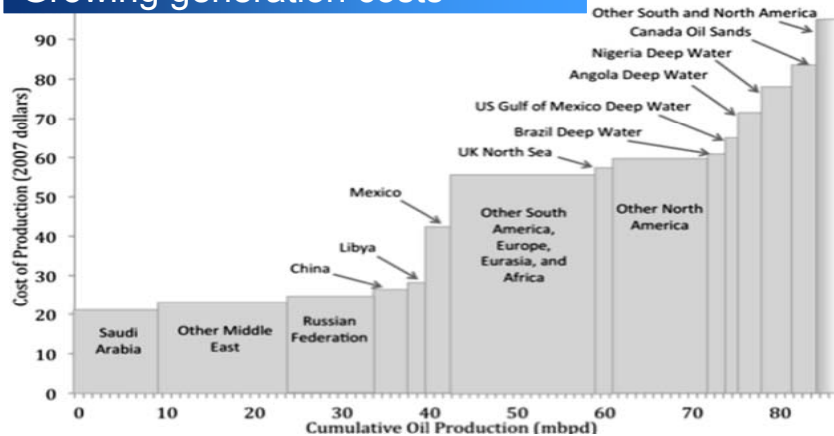
Sources UNPD and World Bank databases, IEA analysis

## Energy demand by fuel



Source: Word Energy Outlook – IEA. New policies scenario

## Growing generation costs



Source CERA

- The developing countries will need more capacities in the near future  
→ Capacity growth
- The OECD countries need to renew their capacities, to reduce their CO<sub>2</sub> emissions  
→ Capacity renewal
- More demand on fuel resources implies tensions on supply side, with increased costs to access the resources (environmental and technical constraints)  
→ Increased costs to access to energy

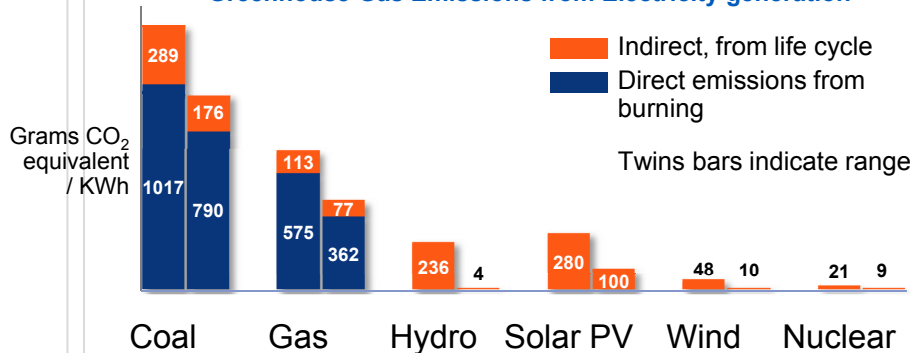
# Key challenge: need for low-CO<sub>2</sub> energy to decarbonize the economy

To keep the climate change under control, importance of limiting the greenhouse gas emissions, both from a supply point of view (decarbonized generation) and from a demand point of view (consume less and more efficiently)

## From a supply point of view:

- Nuclear, hydro and renewable energies are key components for a decarbonized energy mix. For both developed and developing countries
- However, mature energies (coal), allied with new technologies (supercritical coal plants, CCS) are still key solutions to answer the needs of rapid developing countries

Greenhouse Gas Emissions from Electricity generation



Source: IAEA

## From a demand point of view, with the key role of networks

- Energy demand management will have to play a key role to decrease CO<sub>2</sub> emissions. As an example, the EU commission targets a 20% increase in energy efficiency by 2020
- This energy demand management will also be supported by networks through smart-metering systems, enabling a better demand-supply management
- Moreover, as renewable energies will represent an increasing share in tomorrow's energy mix, they will create constraints on networks management because of intermittence problems, hence the necessity to invest in networks and R&D

## Did you know?

### Worldwide

**2010:** 2/3 of electricity generated with fossil-fuels

### 2050 UN target:

2/3 of electricity generated with carbon-free energies

### European Union:

The 2050 roadmap of the EU targets forecasts a 80-95% greenhouse gas reduction by 2050 vs. 1990, with milestones in 2020 (-25%), 2030 (-40%) and 2040 (-60%)

## Changes in the energy sector brings a new dimension

### ■ Opportunities:

- High investments expected in the medium term
  - Growth in developing countries, capacity renewal will begin shortly in developed countries
  - Implementation of policies favourable to investment in some countries (Energy Market reform in the UK, NOME Law in France)
- Change in the paradigm: from fossil-fuel dependent electricity generation to low-CO<sub>2</sub> generation means:
  - Creation of opportunities for decarbonized generators
  - Opportunities to leverage R&D and technology (generation, networks, trading...)
- Capital-intensive industries: barriers to entry for incumbents on a large part of the value chain (excepted Supply)
  - High technology industry
  - Importance of experience

### ■ Constraints:

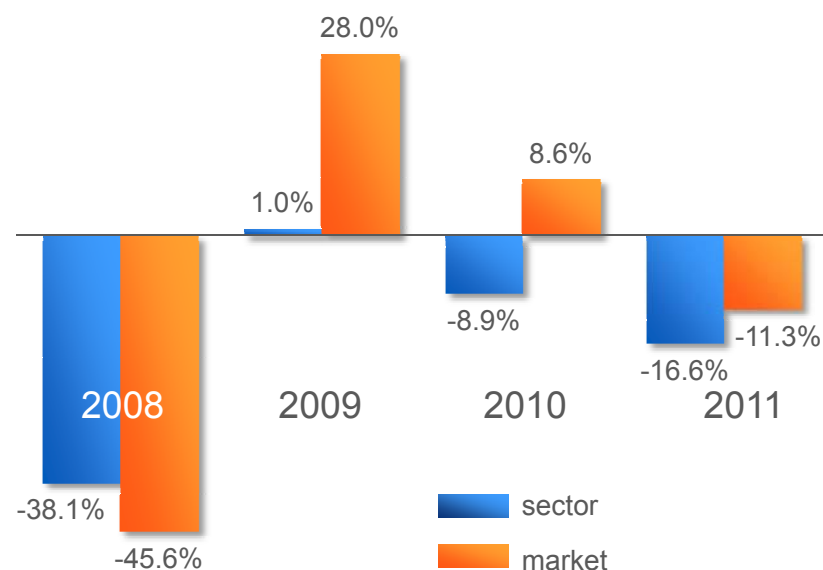
- Environmental constraints
  - Decarbonization often implies higher costs
  - Increased difficulties in building greenfield infrastructures, and more generally, lower acceptance from societies for new infrastructures
- Political environment witnessing increased state interference
  - Cost of energy is a major social challenge
  - Utilities often considered as “cash cows” (Robin Hood tax in Italy, Nuclear tax in Belgium and in Germany ...)
- High correlation to volatile commodity markets and economic cycle

## Governments facing a triple challenge: « climate, economic crisis and energy cost»

- New divergent post-Fukushima energy policies
  - Germany: phasing-out of nuclear energy with a potential cost of the « Energie Konzept » estimated at €250bn, although energy prices in Germany are already among the highest in Europe
  - UK: support of nuclear energy with the implementation of the Energy Market Reform with a floor for the CO<sub>2</sub> price and guaranteed prices for decarbonized energies
- Taxes: rumors/realities
  - Belgium: nuclear tax
  - Germany: nuclear tax of €2.3bn
  - Italy: Robin Hood 2 tax

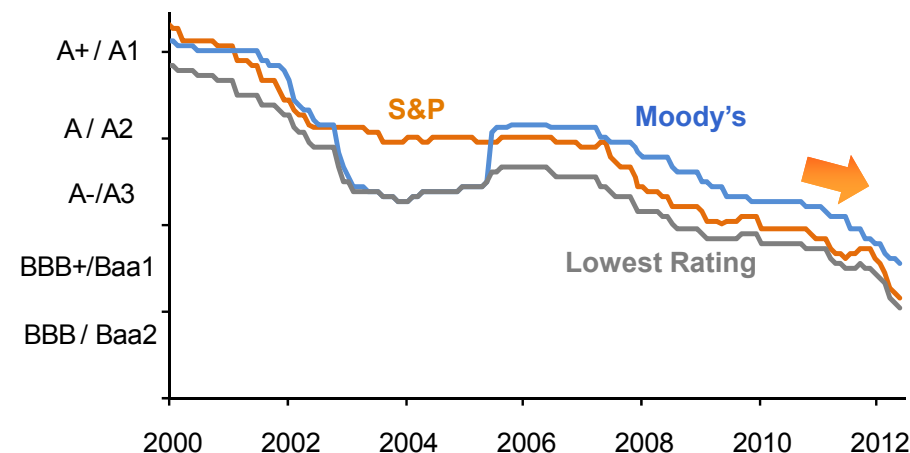
# The fundamentals of the sector have changed significantly between 2008 and 2011...

The utilities sector has been very volatile since the crisis



Sources Bloomberg

... and is getting worse on the credit side

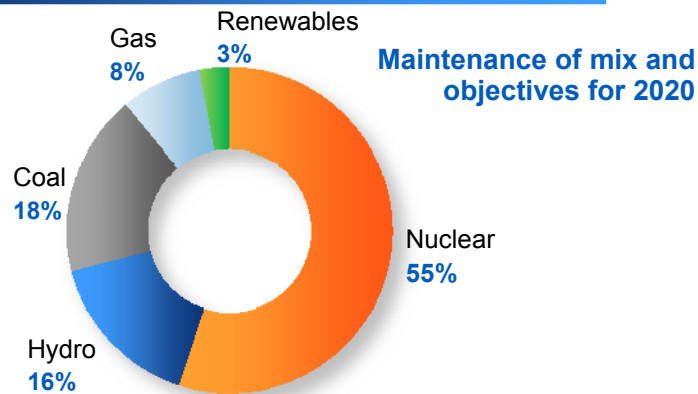


Sources Crédit Suisse

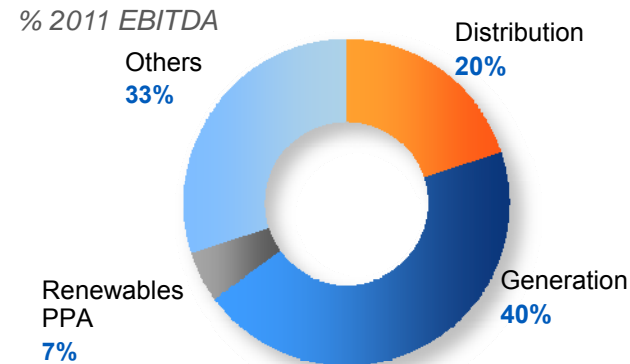
The utilities sector is no longer uniformly considered as « defensive » due to its exposure to commodity risks, increasing its sensitivity to economic cycles and reduced exposure to “regulated” assets

# EDF is well-positioned to meet the challenges of this new environment through its hybrid model...

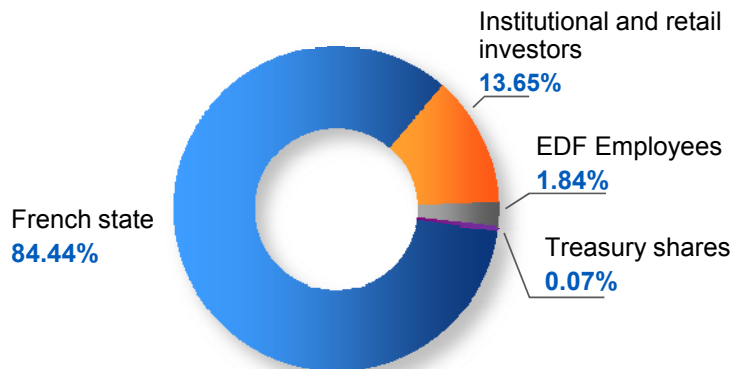
## A EDF: a 75% low carbon energy mix



## B ... little driven by changes in commodity prices because of highly visible activities

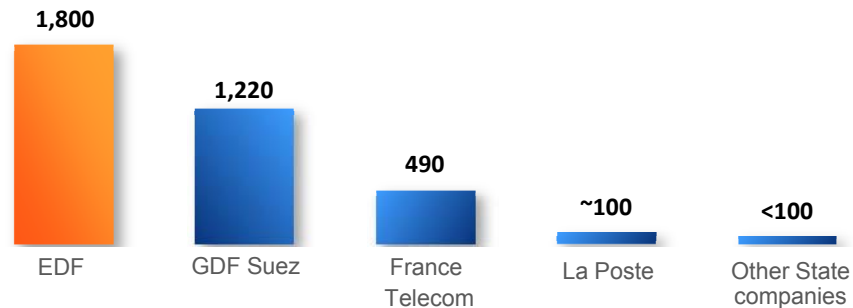


## C EDF is a listed company with the State as major shareholder



## D EDF = 44% of dividends paid by state-owned companies to the French State

Cash dividend collected by the French State in 2010 €M





Source: French Government Agency

### Did you know?

EDF is a major contributor to the State budget: 2.5% -3% of the French State budget is derived from EDF accounts



## High visible activities...

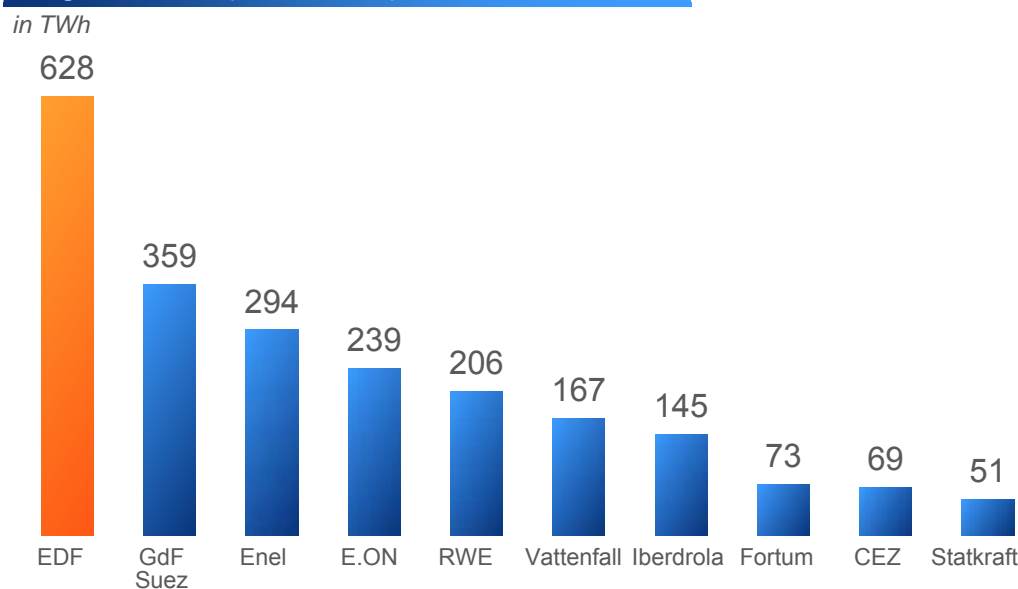
	Networks	Generation France	Nuclear UK	Renewables and PPA
% of current business <sup>(1)</sup>	~20%	~40%	~2% <sup>(2)</sup>	~5%
Trend in EDF business	=	=		
Type of regulation / support	<b>Tariffs regulation</b> (TURPE in France)	<b>NOME law:</b> 25% of existing French nuclear generation sold under a price formula <b>Regulated tariffs:</b> for a large part of the remaining generation	<b>Existing nuclear fleet:</b> 20% of generation under PPA (Centrica) <b>NNB:</b> Introduction of a carbon floor and Contracts for Difference (CFD)	Mainly through <b>PPA</b> and <b>long term contracts</b>
Visibility	Tariffs for 4 years "cost +" type regulation Remuneration on RAB of 7.25% A grid fee preventing the Distribution from any volume risk	<b>Nome law:</b> till 2025 <b>Regulated tariffs:</b> till 2015 for industrial customers, unlimited for residential customers	<b>Carbon floor voted in March 2011</b> <b>CfD expected in 2014</b>	Depending on countries, but <b>contract length typically between 10 and 20 years</b>

<sup>(1)</sup>Based on 2011 figures

<sup>(2)</sup>PPA to Centrica

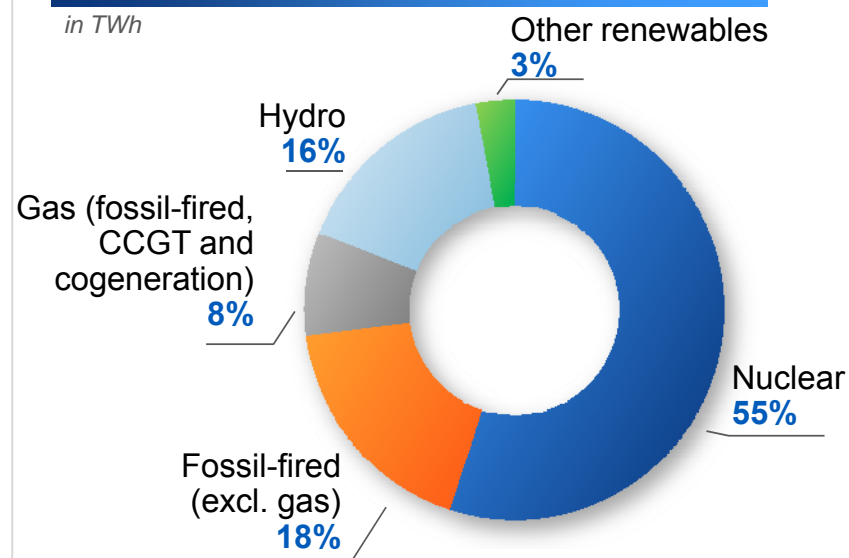
# A leading low-carbon utility, with 135 GW of net installed capacity

The leading European utilities in terms of generation (2011 data)



€14.8bn 2011 EBITDA  
Power producer  
#1 in France and in the UK, #2 in Italy<sup>(1)</sup>

EDF Group installed capacity mix in 2011



A very cost competitive generation mix  
Lower exposure to commodity risk vs peers  
One of the least-carbon intensive utility  
European Carbon factor of 337g CO<sub>2</sub>/KWh<sup>(2)</sup> vs. 108.9 for EDF<sup>(2)</sup>

(1) avec 50% d'Edipower

(2) 2010 figures for the European carbon factor, 2011 figure for EDF

# CO<sub>2</sub> is a risk but also a source of business and profitable growth

- Using the tools of « carbon finance »
  - The development of the EDF Trading Carbon Fund
    - The €290M fund, created in 2006, is one of the most important carbon funds in Europe and the only one of its size where all participants are « compliant ».
    - It is made up of around 100 projects in a dozen of countries (China, SE Asia, South America and North Africa)
- Benefiting from European regulation to boost renewable development
  - Via regulated purchase price or to minimize compliance costs
- Encouraging new uses of electricity to replace fossil fuel technologies

## 2013-2020: EU-ETS phase 3

- An increased carbon risk...
  - On all our emissions, not only the difference between emissions and allocation
  - In a political context which should lead to an increasing carbon price (German nuclear phase out, etc ...)
- ... mitigated using all possible action levers
  - Carbon emissions to be considered in all investments projects in Europe
  - Coherent hedging policies in Europe

### Did you know?

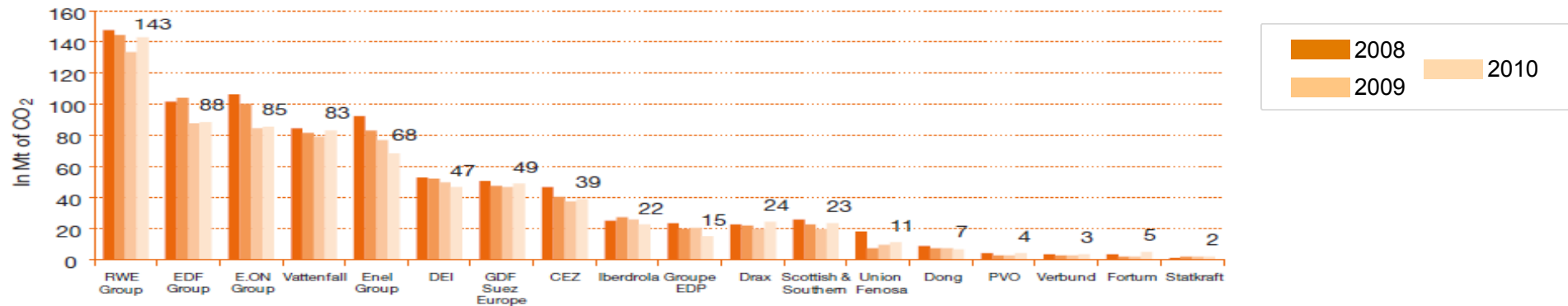
The EU Emissions Trading System (EU ETS) is a cornerstone of the European Union's policy to tackle climate change since 2005 and its key tool for reducing industrial greenhouse gas emissions cost-effectively. Being the first and biggest international scheme for the trading of greenhouse gas emission allowances, the EU ETS covers some 11,000 power stations and industrial plants in 30 countries

The system works on the "cap and trade" principle. Within this cap, companies receive emission allowances which they can sell to or buy from one another as needed. The limit on the total number of allowances available ensures that they have a value. From 2013, all emissions will have to be paid for

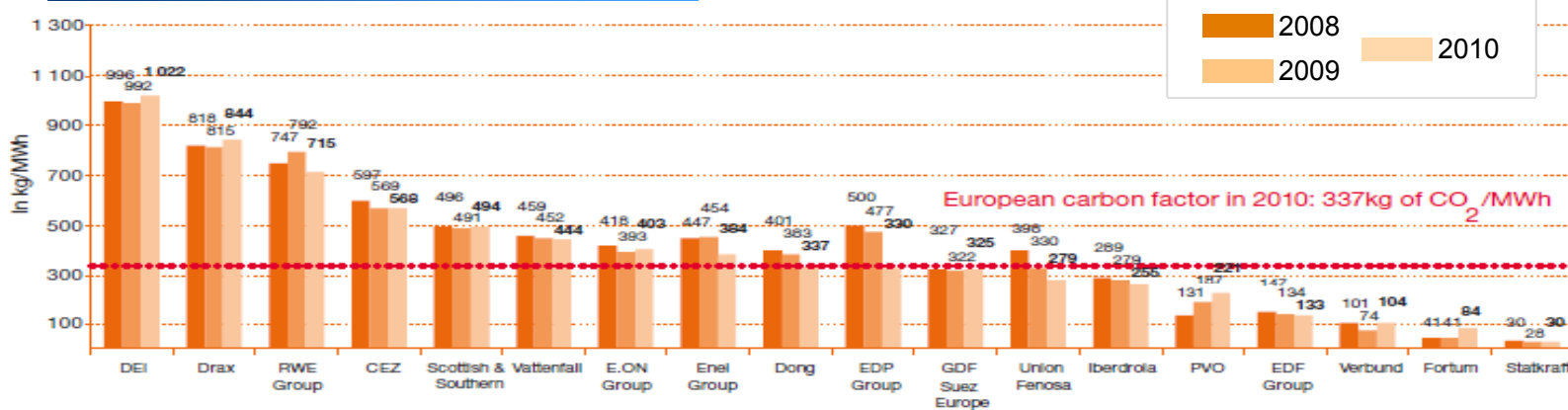
# EDF's first strategic pillar is about low carbon intensity

## CO<sub>2</sub> Emissions in Europe 2008-2010

CO<sub>2</sub> emissions in Europe 2007-2010 (all companies in the selection)



## European Carbon Factor 2010

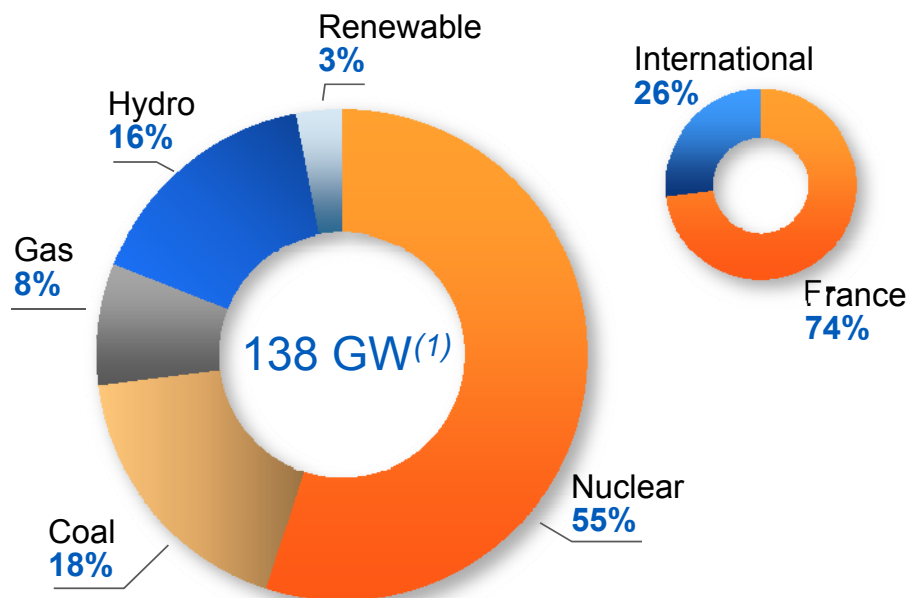


EDF is the #2 largest CO<sub>2</sub> emitter in absolute value

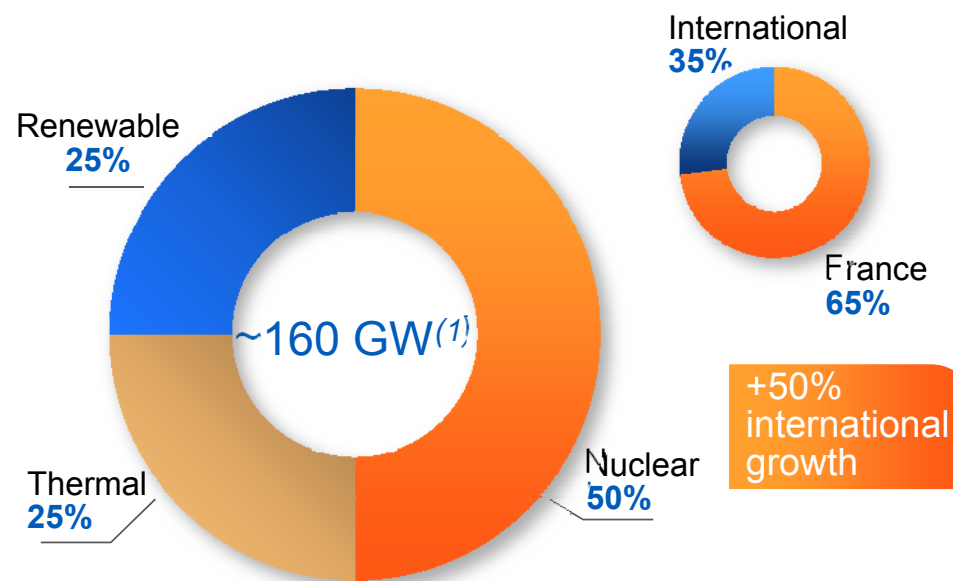
But the lowest emitter in specific value (g/kWh) among major European utilities

## EDF in 2020: a 75% carbon-free electricity producer

Capacity installed (in GW)  
*consolidated figure as at 31 December 2011*



Projections for 2020 installed capacity (in GW)



EDF Fuel mix – by fuel type and by geographical area

# Year 2011

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## Financials

Historical financials

Since 2010, streamlining of the Group

Debt profile of the EDF Group

Focus on nuclear provisions

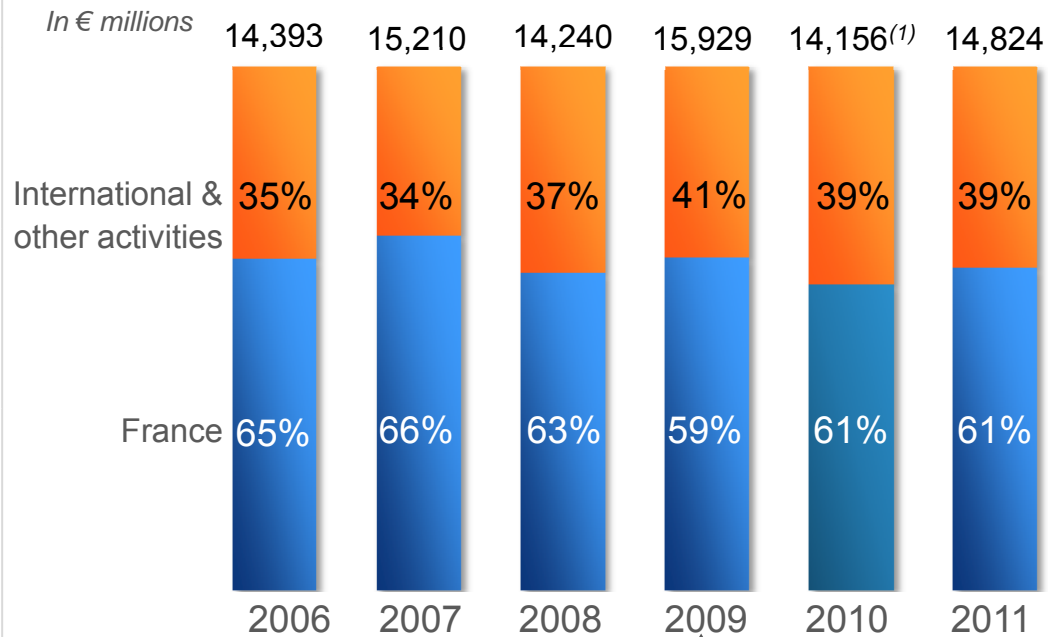
CSPE



# Historical financials

## EBITDA change from 2006

In € millions



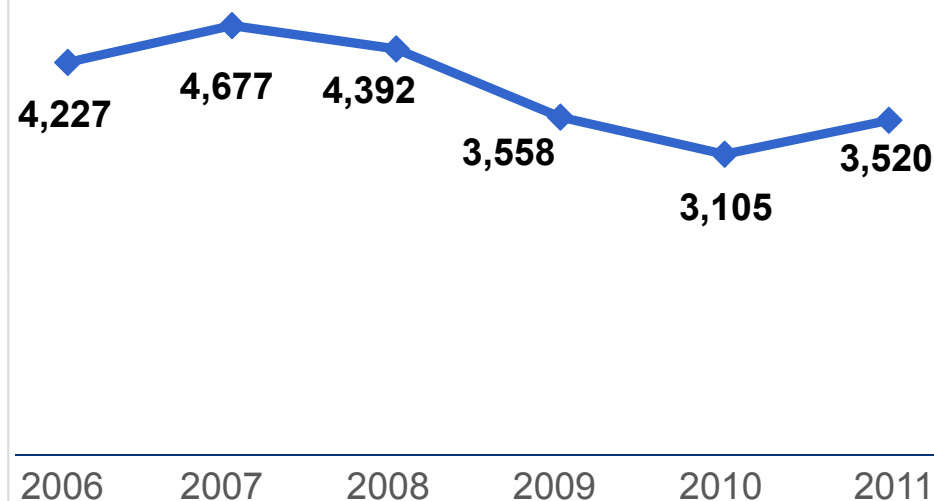
**2009** Buy-out of British Energy

**2010** Sale of EnBW and UK Networks  
Deconsolidation of RTE

**2011** Buy-out of EDF EN

## Recurring net income

In € millions



(1) Excluding RTE, UK Networks and EnBW

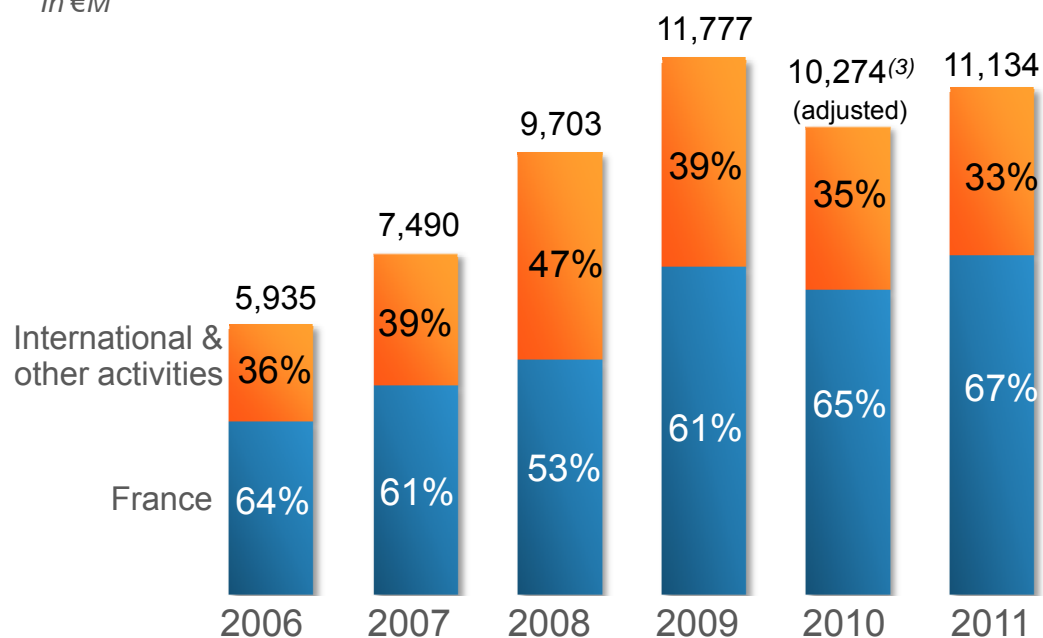
NB: the data presented are pro forma data from one year to another but are not retreated consistently through all years



# Historical financials

## CAPEX<sup>(1)</sup> change from 2006

In €M



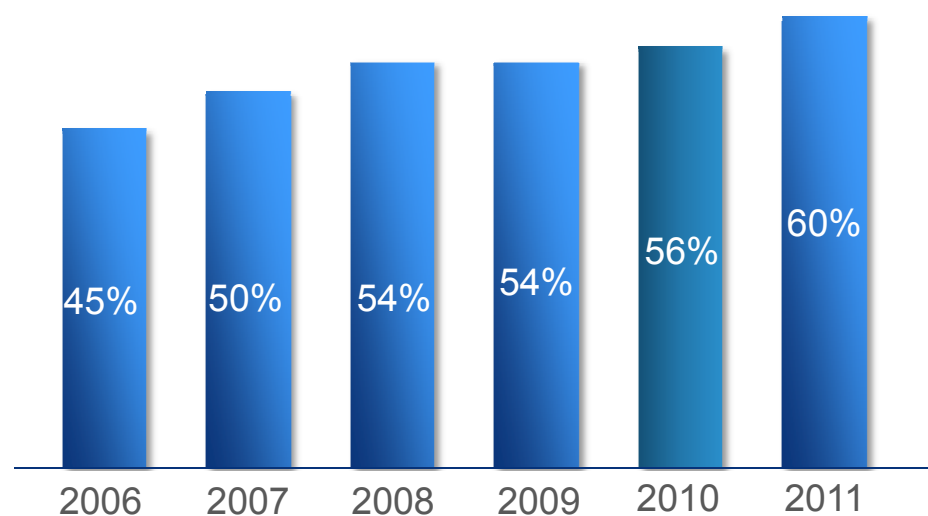
## Net debt and net debt/EBITDA from 2006

In €M

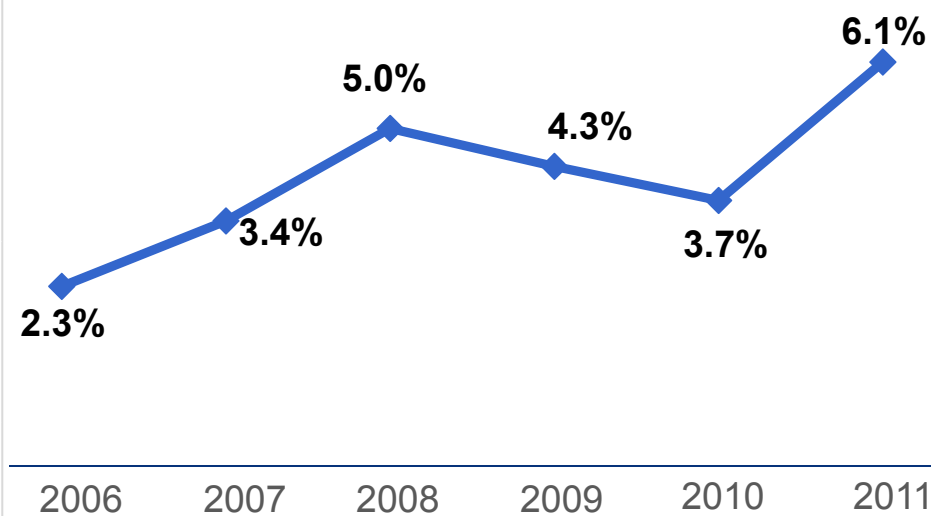


# Historical financials

## Dividend payout ratio



## Dividend yield<sup>(1)</sup>



(1) Computed on last trading day of the respective years

(2) Part of dividend paid as scrip dividend in 2009, cash dividend yield of 2.4%

## 2011 simplified income statement (published)

In €M	2010 adjusted	2011 published
<b>Sales</b>	<b>63,922</b>	<b>65,307</b>
Fuel and energy purchases	(29,378)	(30,195)
Other external expenses	(9,890)	(9,931)
Personnel expenses	(10,418)	(10,917)
Taxes other than income taxes	(2,750)	(3,101)
Other operating income and expenses and TaRTAM extension (Laws of 7 June 2010 and 7 December 2010)	2,670	3,661
<b>EBITDA</b>	<b>14,156</b>	<b>14,824</b>
Net changes in fair value on Energy & Commodity derivatives, excluding trading activities	15	(116)
Net depreciation and amortization & increases in provisions for renewal of PP&E operated under concession	(6,862)	(6,506)
Impairments & other income and expenses	(2,591)	84
<b>EBIT</b>	<b>4,718</b>	<b>8,286</b>
<b>Financial result</b>	<b>(3,896)</b>	<b>(3,780)</b>
<b>Income before taxes of consolidated companies</b>	<b>822</b>	<b>4,506</b>
<b>EDF Net income</b>	<b>409</b>	<b>3,010</b>
<b>Current net income<sup>(1)</sup></b>	<b>3,105</b>	<b>3,520</b>

## 2011 simplified balance sheet (published)

<i>In €M</i>	31 December 2010	31 December 2011
Fixed assets	<b>123,844</b>	<b>128,318</b>
<i>O/w Goodwill</i>	<b>12,028</b>	<b>11,648</b>
Inventories and trade receivables	<b>32,209</b>	<b>34,489</b>
Other assets	<b>50,333</b>	<b>52,032</b>
Cash and equivalents and other liquid assets <sup>(1)</sup>	<b>16,944</b>	<b>16,184</b>
Assets held for sale (excluding cash and liquid assets)	<b>17,229</b>	<b>684</b>
<b>Total Assets</b>	<b>240,559</b>	<b>231,707</b>

	31 December 2010	31 December 2011
Shareholders' equity (Group Share)	<b>31,317</b>	<b>30,570</b>
Non-controlling Interest	<b>5,586</b>	<b>4,337</b>
Specific concession liabilities	<b>41,161</b>	<b>41,769</b>
Provisions	<b>54,475</b>	<b>55,528</b>
Financial liabilities	<b>51,333</b>	<b>49,469</b>
Other liabilities	<b>47,320</b>	<b>48,897</b>
Liabilities linked to assets held for sale (excluding financial liabilities)	<b>9,367</b>	<b>137</b>
<b>Total Liabilities</b>	<b>240,559</b>	<b>231,707</b>

# Change in cash flow

in millions of euros

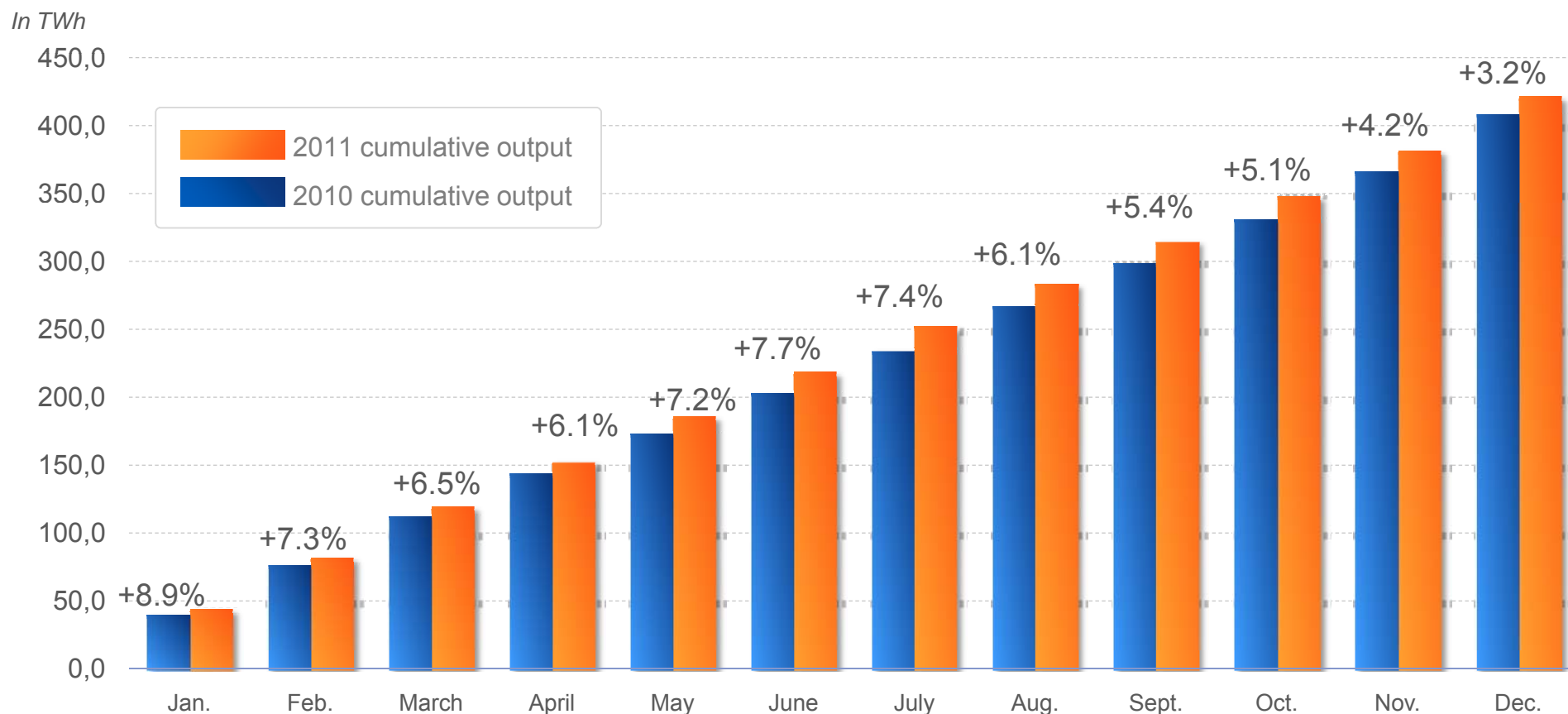
	2010 adjusted	2011	Δ%
<b>EBITDA</b>	<b>14,156</b>	<b>14,824</b>	<b>4.7%</b>
Non-cash items and change in accrued trading income	(1,186)	(1,925)	
Net financial expenses disbursed	(1,748)	(1,623)	
Net income paid	(1,814)	(1,331)	
Other items o/w dividends received from associates	491	336	
<b>Operating cash flow</b>	<b>9,899</b>	<b>10,281</b>	<b>3.9%</b>
Δ WCR	25	(1,121)	
o/w CSPE <sup>(2)</sup>	(968)	(1,009)	
o/w Exeltium	1,747	-	
Gross investments	(10,274)	(11,134)	
Sale of fixed assets	180	497	
<b>Free Cash Flow</b>	<b>(170)</b>	<b>(1,477)</b>	<b>n/a</b>

6.6%<sup>(1)</sup>

(1) Organic growth excluding the consequences of the French ministerial decree ("arrêté") issued on 4 July 2011 with regard to the non-recurring 2011 compensation of TaRTAM charges

(2) The mechanism gap is borne by EDF and results in a receivable in Assets that includes the CSPE billed

## After a solid 2010 nuclear, confirmation of a strong operational performance 2011 (+3.2%)



# Substantial transformation of the Group over last two years

## Initial situation

### Germany

- Joint control of EnBW with 46.07%

### United States

- Joint control of Nuclear New Build with Constellation: 50%/50%
- 49.99% in CENG

### Italy

- Joint control of Edison with 48.96%

### Renewable energies

- 50% in EDF Energies Nouvelles

## Current situation

- Disposal of EDF's stake in EnBW
- Debt reduction: -€7.3bn
- Capital gain on disposal: €253m

- 100% control of Unistar
- Risk reduction: put option terminated
- Preservation of Group's interest in CENG

- Control of Edison: 80.65% minimum
- Limited impact on Group net financial debt/EBITDA : approx. +0.1x

- OPAES<sup>(1)</sup>: 100% control of EDF Energies Nouvelles
- Successful industrial integration
- Limited impact on Group net financial debt/EBITDA : 0.1x

## 2010 disposals / reorganizations

### UK distribution networks <sup>(1)</sup>

- Irrevocable offer of Cheung Kong group<sup>(2)</sup>
- Implied premium to 1 April 2010 RAV<sup>(3)</sup> of 27%
- Multiple of 8.1x estimated 2010 EBITDA for the total business
- Total amount of debt reduction of €6.7bn

### Sale of EDF's shareholding (45.01%) in EnBW

- Irrevocable offer
- €41.5 per EnBW share
- Total amount of €4.7bn<sup>4</sup> (debt reduction of €7.3bn)
- Fully guaranteed by the Land of Baden-Württemberg
- Implicit premium of 18.6% on EnBW share closing price of 12/03/2010

### Contribution of 50% of RTE to the portfolio of dedicated assets

- Improvement of the financing of the nuclear decommissioning costs through regular dividend flow of an infrastructure asset
- Lower volatility of the portfolio of dedicated assets
- Deconsolidation of c. €6.3bn of financial debt
- Avoided cash-out of €2.3bn
- EPS enhancing of up to 2%

(1) 100% of EDF Energy regulated and non-regulated network activities in the UK

(2) Consortium consisting of Cheung Kong Infrastructure Holdings Ltd ("CKI"), Hongkong Electricity Holdings Ltd ("HEH") and Li Ka-Shing Foundation

(3) Regulated Asset Value of regulated electricity distribution networks

(4) Including downpayment of € 1.5 / share on December 16, 2010



# Financial operations started in 2011

## EDF EN (completed)

- EDF now owns 100% of EDF EN share capital
  - Squeeze-out of the minorities on 16 August 2011
- Cost for EDF:
  - Cost of the cash offer: €1,045M
  - Cost of the EDF share buyback: €324M
  - Cost of the squeeze-out at €40 per share: €94M<sup>(1)</sup>

An average price in the order of €37.9 per share  
4.7% premium on EDF EN's share price<sup>(2)</sup>  
before announcement

## EDISON (on-going)

- Purchase of 50% of TdE for ~780 M€<sup>(1)</sup>
  - Edison valued at ~9x EBITDA 2011
- Disposal of Edipower for ~€680M<sup>(2)</sup>
  - Edipower sold for more than 10x 2011 EBITDA
- Signature of a long-term contract for supplying Edipower with Edison gas
  - Volume totals 50% of Edipower's needs, i.e 5% of Edison sourcing
- Launch of a mandatory public tender on the remaining capital of Edison at a price of €0.89/share<sup>(3)</sup>

EDF holds over 80% of Edison as a result  
of the deal

For more information, please check our appendices section

(1) Including a €6m liquidity contract for shares already attributed to EDF Energies Nouvelles employees and excluding an estimated €9M liquidity contract for shares to be attributed

(2) EDF EN price as of 7 April 2011 (€36.6) adjusted for a €0.42 dividend in respect of 2010 financial year

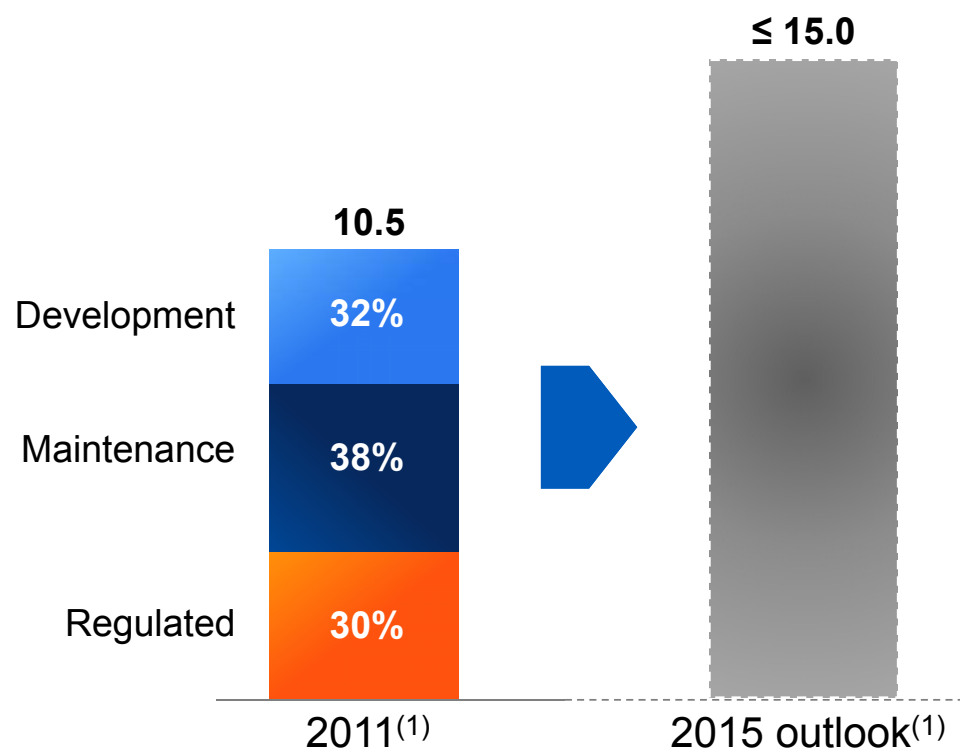
(1) And of around €600m of the share of existing debt

(2) And deconsolidation of around €550m in debt

(3) Maximum amount of the mandatory public offer of approx. €0.9bn if all minority interests tender their shares

## Net Group investment: 2015 outlook

in billions of euros



Group target maintained post-Fukushima: ≤€15bn on a 2015 horizon

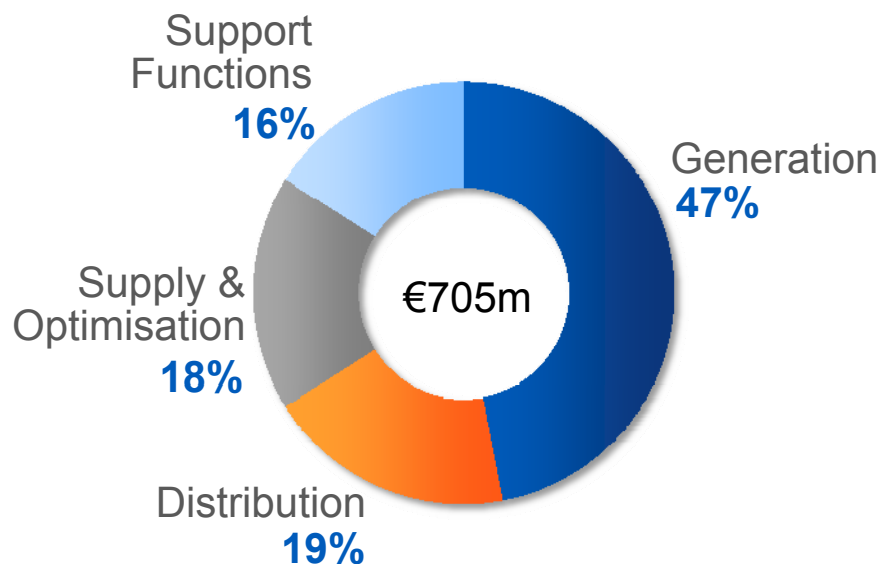
## New investment criteria

- A revised investment process
  - Assistance from the Finance Department to business lines as early as the project study phase
  - Constant monitoring of performances
- Higher investment standards
  - WACC + 300 basis points
  - Or 100 to 150 basis points of additional profitability

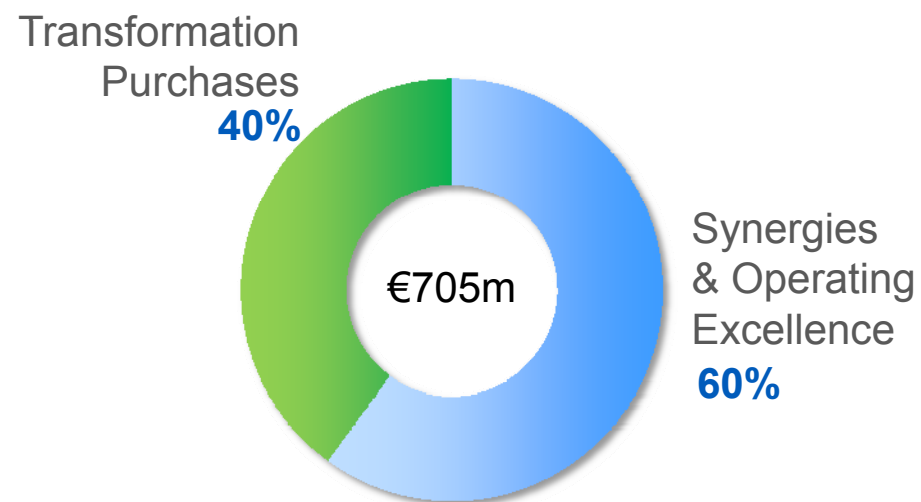
## Group synergies and transformation programme

- Gains made in 2011 that secure more than 28% of the target to 2015
  - Around €705 million in gains made in 2011 out of a total target of roughly €2.5bn

### Breakdown by Group business



### Breakdown by lever



## Confirmation of the 2011-2015 trajectory

- Average annual EBITDA growth<sup>(1)</sup>
- Average annual growth of net income excluding non-recurring items
- Net financial debt/EBITDA
- Payout rate

4% - 6%

5% - 10%

<2.5x

55% - 65%

### For 2012:

- Targets in line with 2011-2015 trajectory
- Dividend: at least stable

*Note: Changes excluding potential impact related to Edison PPA*

*(1) CAGR at constant exchange rates and scope over the period 2011-2015*

## A continued pro-active management of debt and liquidity position

- A **slight improvement in net debt** from €34.4bn (31 December 2010) to €33.3bn (31 December 2011)
- A total liquidity position above €17bn (31 December 2011), of which €5.7bn of cash and cash equivalents
- A targeted **adequacy between cash flows and debt**, as well as an **increased average maturity** of debt at 9.2 years as of 31 December 2011 (vs. 8.9<sup>(1)</sup> years as of 31 December 2010)
  - Target of smoothing out the debt repayments to avoid refinancing peaks
  - Willingness to take on debt in local currencies to fund local operations, as in the UK, with two important long-term £ emissions
    - in 2010 - £1bn with a 40-year maturity and a 5.125% coupon
    - in 2011 - £1.25bn with a 30-year maturity and a 5.5% coupon
- The **best credit ratings among its utility peers**

## Net financial debt

	31/12/2010	31/12/2011
<b>Net financial debt</b>	<b>34.4</b>	<b>33.3</b>
Net financial debt/EBITDA	2.2 <sup>(1)</sup>	2.2
<b>Debt</b>		
▪ Gross financial debt	47.8	50.0
▪ o/w bonds	35.5	37.5
▪ Average age of gross debt (years)	8.9 <sup>(2)</sup>	9.2
▪ Average coupon	4.4%	4.3%
<b>Liquidity</b>		
▪ Gross liquidity	25.2	24.9
▪ Financial debt < 1 year <sup>(3)</sup>	7.3	7.8
▪ Net liquidity	17.9	17.1

(1) Excluding EnBW debt

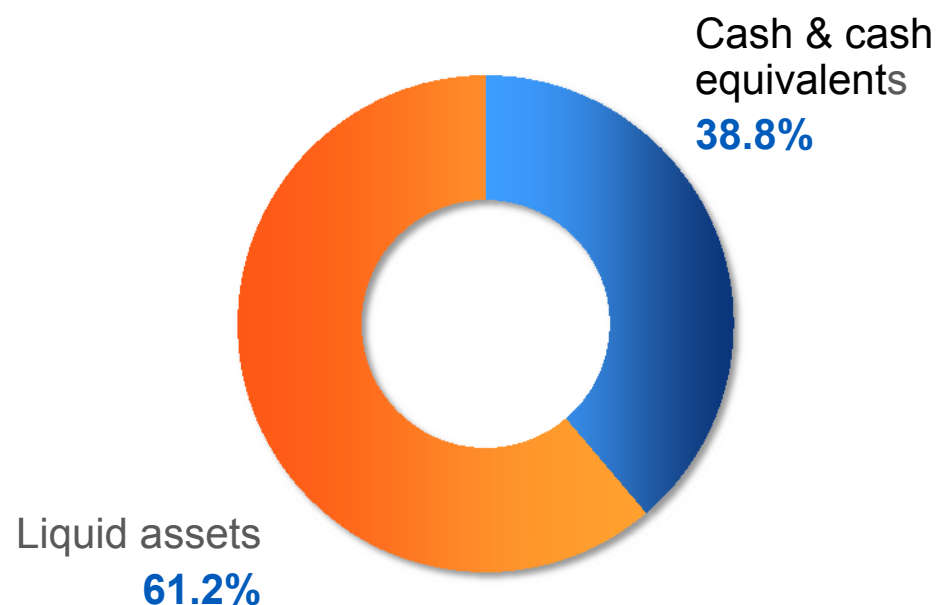
(2) 2010 data restated from change in methodology at 30 June 2011: calculation of average maturity on the basis of quarterly vs. annual flows in 2010

(3) Including share of less than 1 year – RTE loan

## A strong liquidity position

- Liquidity position excluding credit lines of €14.7bn, o/w
  - €5.7bn of cash & cash equivalents
  - €9.0bn of liquid assets
- Available syndicated and bilateral credit of €10.2bn
  - This potential liquidity is without any financial covenant

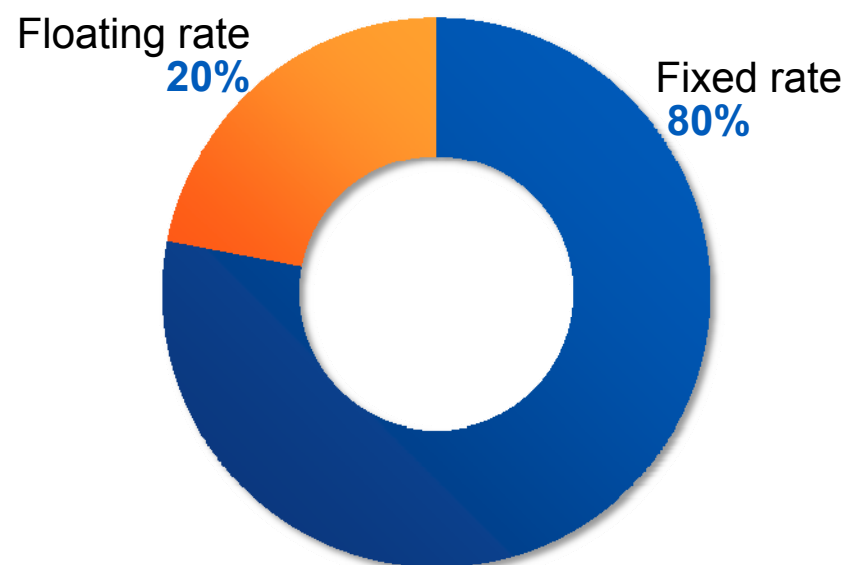
Split of the liquidity position as of 31 December 2011



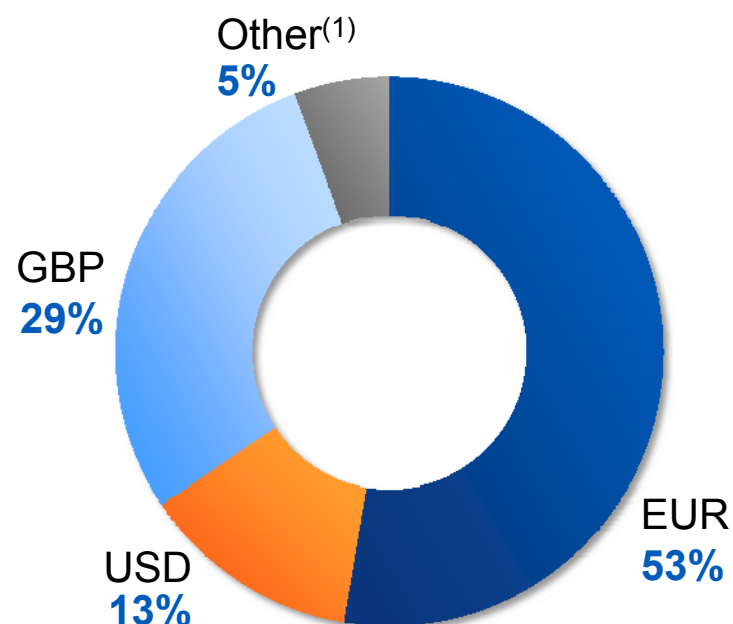


## Group financial debt after swaps as of 31 December 2011

### Breakdown by type of rate

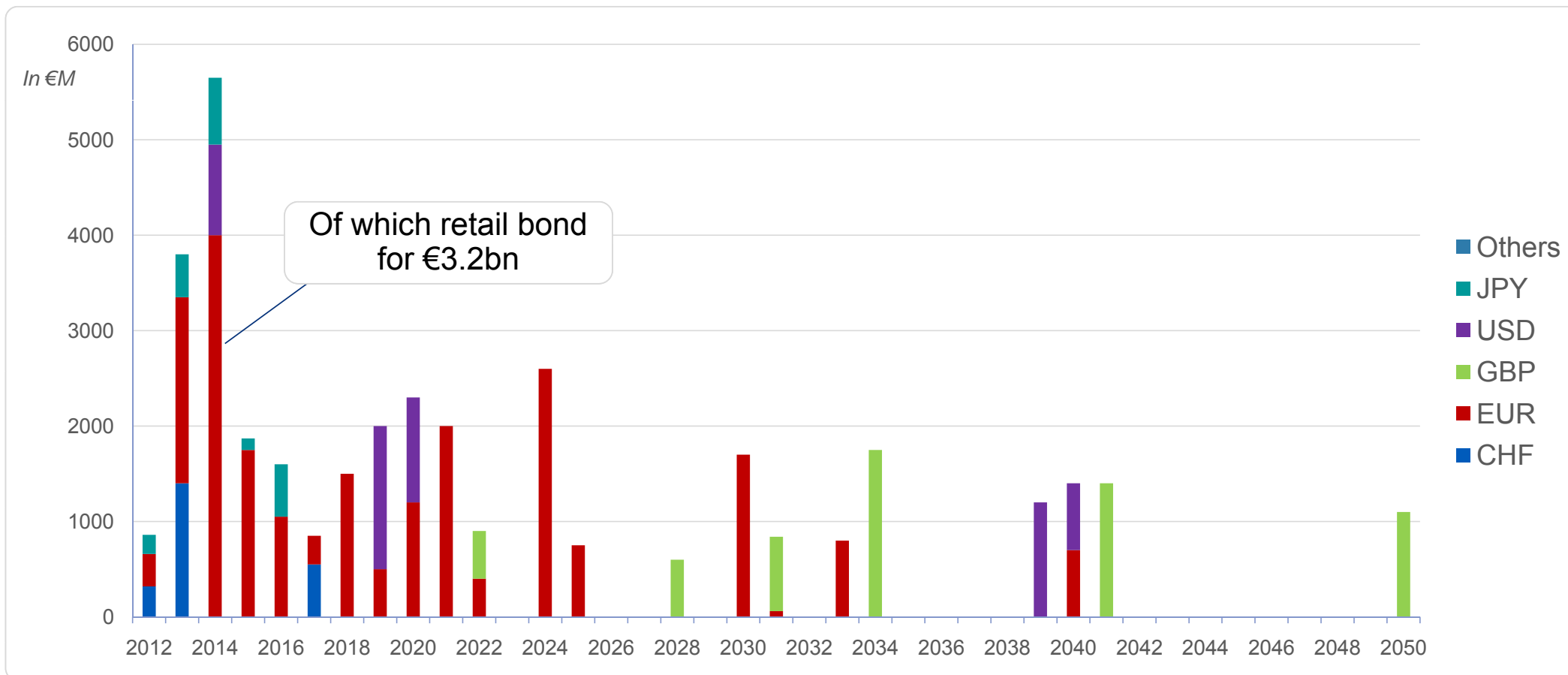


### Breakdown by currency

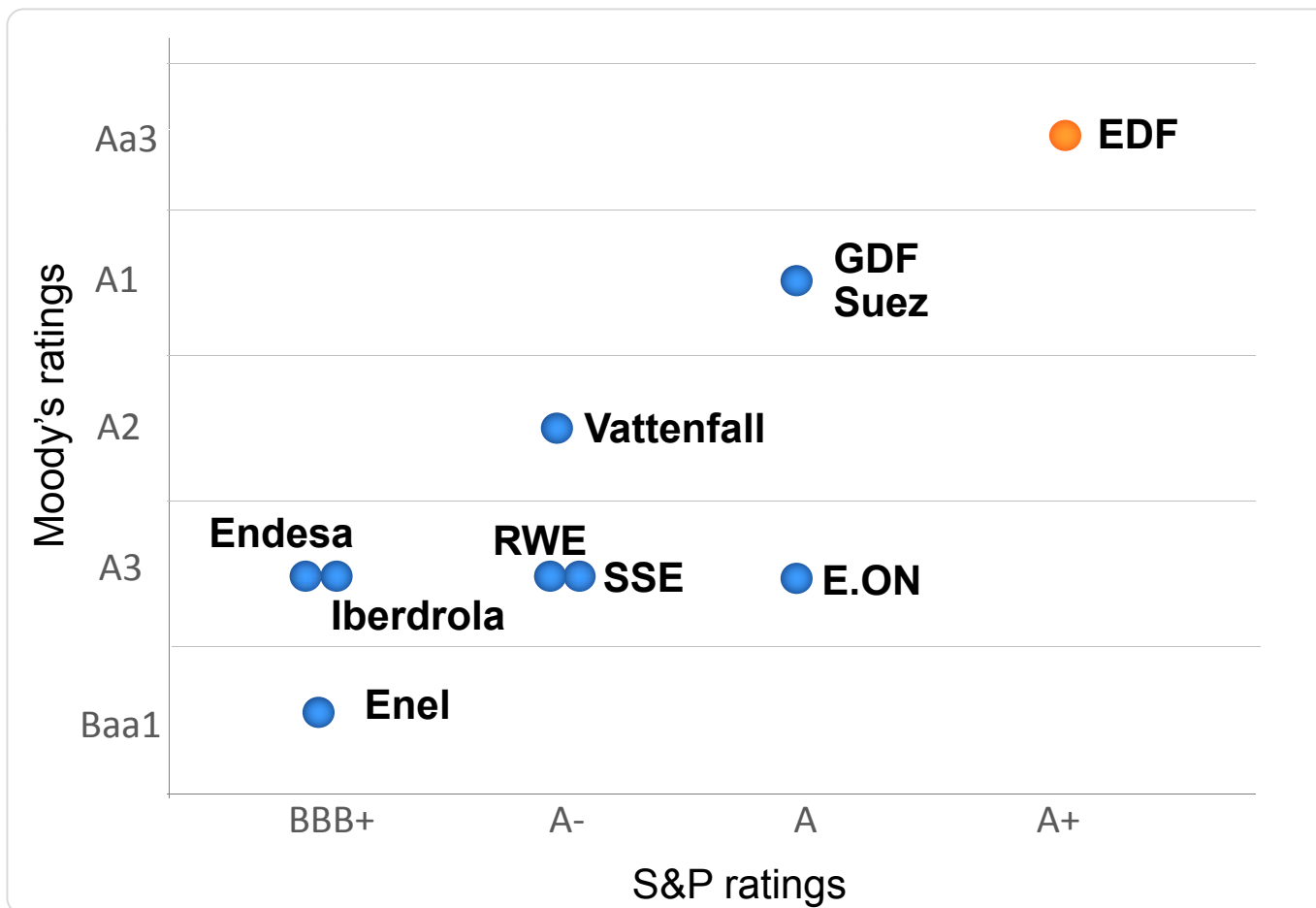


Gross financial debt: **€50.0bn**  
Net financial debt: **€33.3bn**  
Average coupon: **4.3%**  
Average maturity: **9.2 years**

## Breakdown of bonds by currency (as at 31 december 2011)



## Comparative debt ratings: EDF is leading its peers

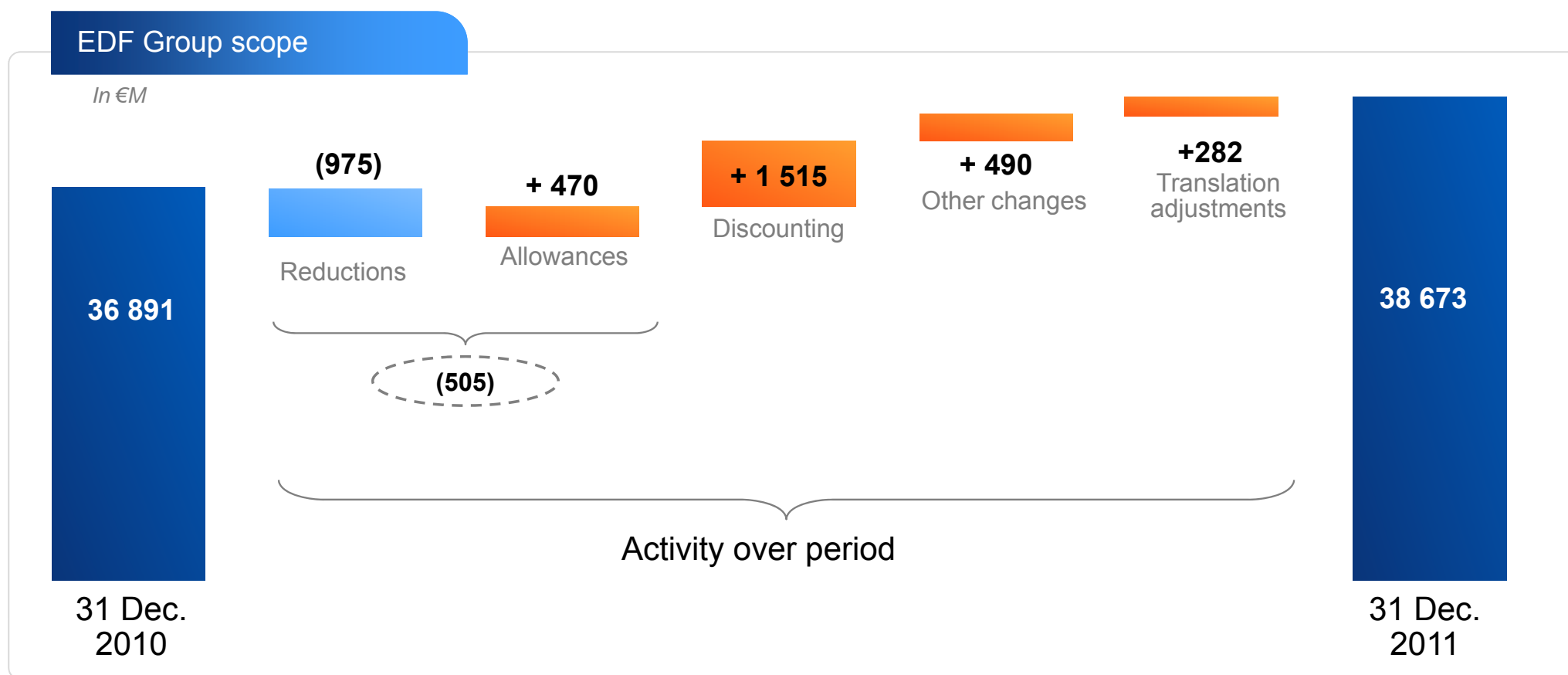


	Ratings S&P	Ratings Moody's	Ratings Fitch
EDF	A+ stable <sup>(1)</sup>	Aa3 stable	A+ stable
GDF Suez	A stable	A1 neg. CW	NA
EON	A negative	A3 stable	A stable
Enel	BBB+ stable	Baa1 stable	A - neg. CW
Iberdrola	BBB+ stable	A3 stable	A- neg. CW
Scottish & Southern	A - stable	A3 stable	A- stable
RWE	A- negative	A3 negative	A negative
Endesa	BBB+ stable	A3 negative	A- neg. CW
Vattenfall	A- stable	A2 negative	A- stable
EDF short term	A-1	P-1	F1

Source: Bloomberg, as at 21 May 2012

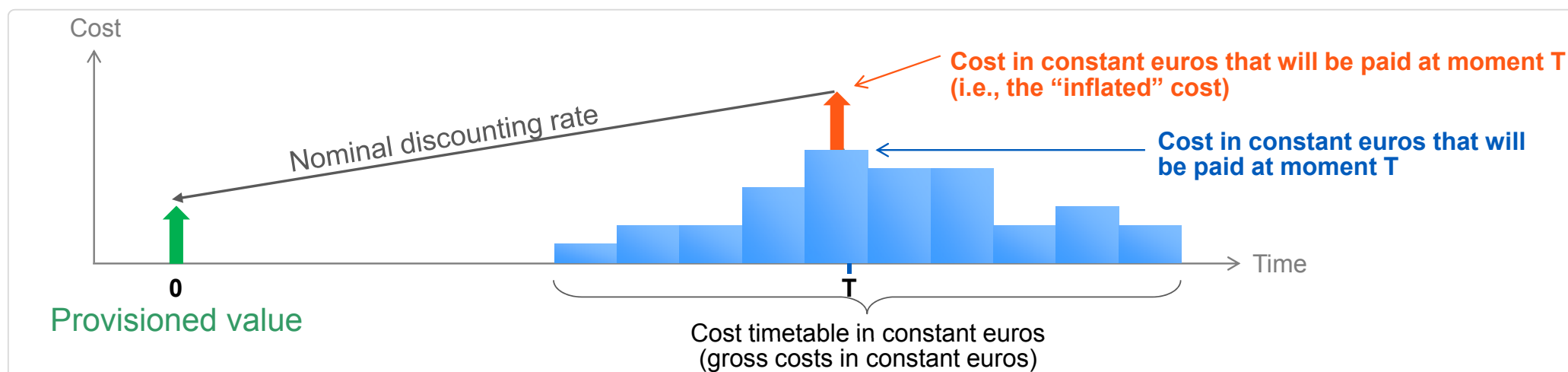


## Group nuclear provisions: €38.7bn



## Principles used in discounting provisions

- Costs are estimated using year-end economic conditions and spread out over a provisional timetable of disbursements
  - These costs are determined in constant euros (i.e. the cost if the payment was made today)
  - These costs are positioned in time on the basis of a timetable set by the company
- The costs are then provisioned on the basis of year end discounted values



## Discounting rate for provisions in France

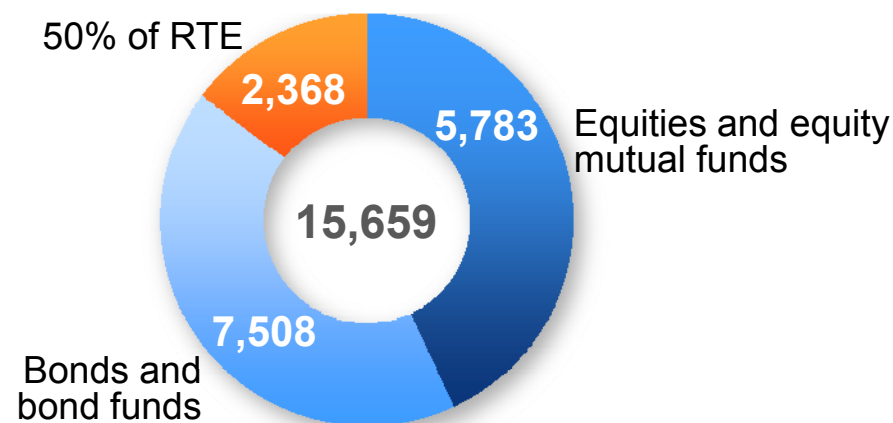
- 2011 discounting rates maintained as of 31 December 2011
- Nuclear provisions: 5%
  - The discounting rate is based on the yield of a sovereign bond (French OAT) of the same duration as the liability in question, plus the average spread of a selection of companies with the same rating as the company carrying the liability
  - The executive order of 23 February 2007 and the ministerial order of 21 March 2007 pertaining to the funding of nuclear liabilities states that the discounting rate used by EDF may not exceed a ceiling “that is equal to the arithmetic average over the past 48 months of the 30-year constant maturity rate (TEC 30), on the closing date of the financial year under review, plus 1 point”

## EDF dedicated assets

- Cover nuclear plant decommissioning costs and radioactive waste storage and long-term management
- Portfolio set-up deadline originally set at June 2011 and extended to 2016
- In 2011, EDF adopted a cautious investment strategy, particularly in the second half of the year
  - Exposure reduced to struggling sovereigns
  - Position on equity markets reduced
  - Reinforced weighting of cash and cash equivalent
- RTE shares allocated to dedicated assets played their role as a buffer to overall performance

### Portfolio breakdown as of 31 December 2011

In €M



2011

Return<sup>(1)</sup> -0.52%

## Purpose and regulatory framework of dedicated assets

**Dedicated assets are meant to secure the costs of dismantling nuclear power plants. The portfolio of dedicated assets started to be built in 2000 and is consistent with a regulatory framework set up in 2006**

- Law of 28 June 2006 (“*loi de programme*” – NOME law of 7 December 2010)
  - A portfolio of dedicated assets was set up with a value equivalent to at least 75% of provisions in mid-2011 and a projected 100% by mid-2016
  - Effective mid-2016, the portfolio’s realisation value must be at least equal to the amount of the provisions covered
  - In the event that it is not, the administrative authority may order corrective measures
- Executive Order (“*décret*”) of 23 February 2007
  - This executive order contains a precise list of assets that are eligible for the portfolio of dedicated assets and their maximum authorised portion, and excludes certain categories of assets
  - It specifies the nuclear costs on which basis the amount of dedicated assets is set and establishes a regulatory ceiling on the discounting rate of liabilities, and a grace period that is based on economic conditions and markets situation and which may not exceed three years
- Executive Order (“*décret*”) of 31 December 2010
  - This authorises EDF to include in its portfolio of dedicated assets, shares in RTE



## Calculation base for dedicated assets

Provisions at 31 December 2011: €18.5bn

In €bn

Provisions  
at 31 December 2011

18.5

of which cost of dismantling  
pressurized water reactors = €9.7bn

of which LT management of  
radioactive waste = €6.7bn

Dedicated assets at  
31 December 2011

15.7

RTE 2.4

Other  
Dedicated assets 13.3

The coverage rate is 84.7%. The Law of 28 June 2006, as amended by the NOME law, requires a coverage rate of at least 75% and sets an objective of 100% by June 2016

## What is covered by long-term management of radioactive waste?

- Evacuation and storage of radioactive waste from the dismantling of nuclear facilities
- Evacuation and storage of radioactive waste from the treatment of spent fuel in The Hague
- Long-term warehousing and direct storage not recyclable on an industrial scale
- EDF share of evaluation costs and costs of coverage, closing and supervision of storage centres:
  - Existing centres for very low-level, low-level and intermediate-level radioactive waste
  - Centres need to be created for long-lived radioactive waste

# French nuclear provisions: €29.2bn

In €M

	31 Dec 2010	Reductions	Net Allow.	Disc.	Other changes	31 Dec 2011
<b>Provisions for back-end nuclear cycle</b>						
<b>Total</b>	<b>15,360</b>	<b>(690)</b>	<b>410</b>	<b>760</b>	<b>25</b>	<b>15,865</b>
Provisions for management of spent fuel	8,852	(540)	374	438	19	9,143
Provisions for long-term management of radioactive waste	6,508	(150)	36	322	6	6,722
<b>Provisions for nuclear dismantling and last core</b>						
<b>Total</b>	<b>12,937</b>	<b>(224)</b>	<b>11</b>	<b>647</b>	<b>7</b>	<b>13,378</b>
Provisions for dismantling power stations	11,031	(224)	0	552	7	11,366
Provisions for last cores	1,906	-	11	95	-	2,012
<b>TOTAL (NUCLEAR)</b>	<b>28,297</b>	<b>(914)</b>	<b>421</b>	<b>1,407</b>	<b>32</b>	<b>29,243</b>

## Scope of CSPE (contribution to electricity public service costs)

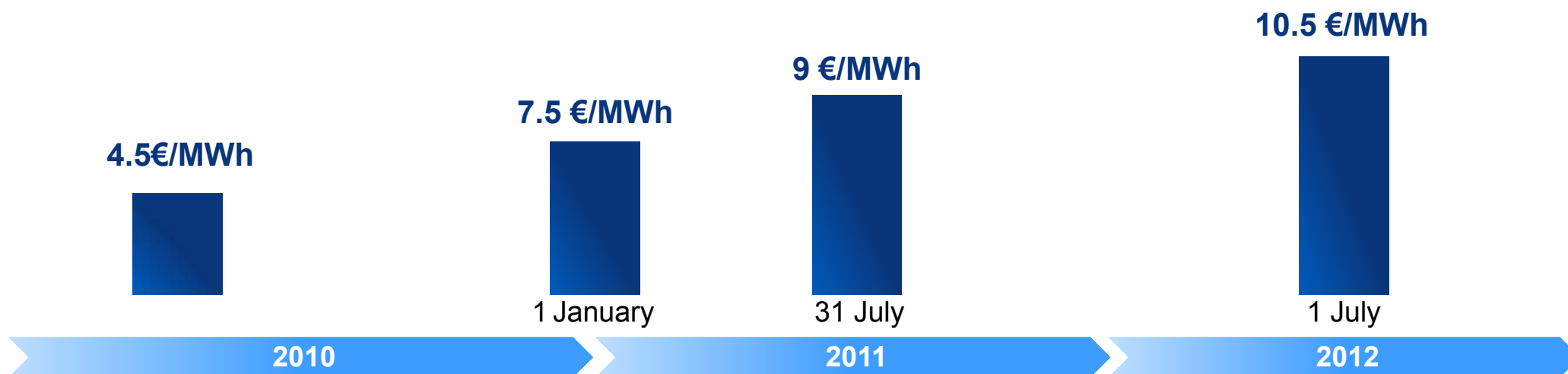
### The CSPE covers 3 different public service mandates:

- Lost revenue and additional costs associated with EDF's participation in the TPN (priority need tariff) for low-income households
- Number of people concerned:
  - 625,000 clients in 2011 for the TPN
  - 211,000 clients in 2011 for the FSL<sup>(1)</sup>
- Additional generation costs in non-interconnected regions (Corsica and the overseas departments and territories) not covered by the energy share of regulated tariffs
  - Electricity is sold in non-interconnected regions at the same price as mainland France despite significantly higher generation costs
- Purchase obligations
  - Originally designed for cogeneration units, they have now been extended to output volumes of electricity generated using renewable energy sources (mainly wind and solar power)

## Main principles and increases of the CSPE

### ■ La Contribution au Service Public de l'Electricité (CSPE) :

- Charged to end users via an "other services" line on their energy bill
- Collected by network operators and electricity suppliers
- Periodically amended: "Barring a decree setting the amount of the contribution due for a given year prior to 31 December of the previous year, the amount proposed by the Energy Regulation Commission (CRE) French regulator, in accordance with the preceding paragraph, enters into force on 1 January, within the limit however of an increase of €0.003/Kwh with respect to the amount applied before this date". Increase of 1 January 2012 is splitting in two: €0.0015/KWh in July 2011 and €0.0015/KWh in July 2012



## Main CSPE components for EDF

In €M	2009		2010		2011	
Purchase obligations <sup>(1)</sup>	1,541	58%	1,599	61%	2,244	63%
Others <sup>(2)</sup>	1,123	42%	1,006	39%	1,312	37%
<b>Total CSPE</b>	<b>2,664</b>		<b>2,605</b>		<b>3,556</b>	

- In the overseas departments and Corsica, the generation costs vary with energy and fuel purchases, the cost of replacing old power plants and purchases from purchase obligations
- The rise in the CSPE is linked to purchase obligations, which take into account the expansion PV power

(1) Purchases obligations include electricity generated from: hydropower (less than 12 MW), biomass, wind power, PV power, cogeneration, recovery of household waste and energy recovery, with the exception of Corsica and the overseas departments

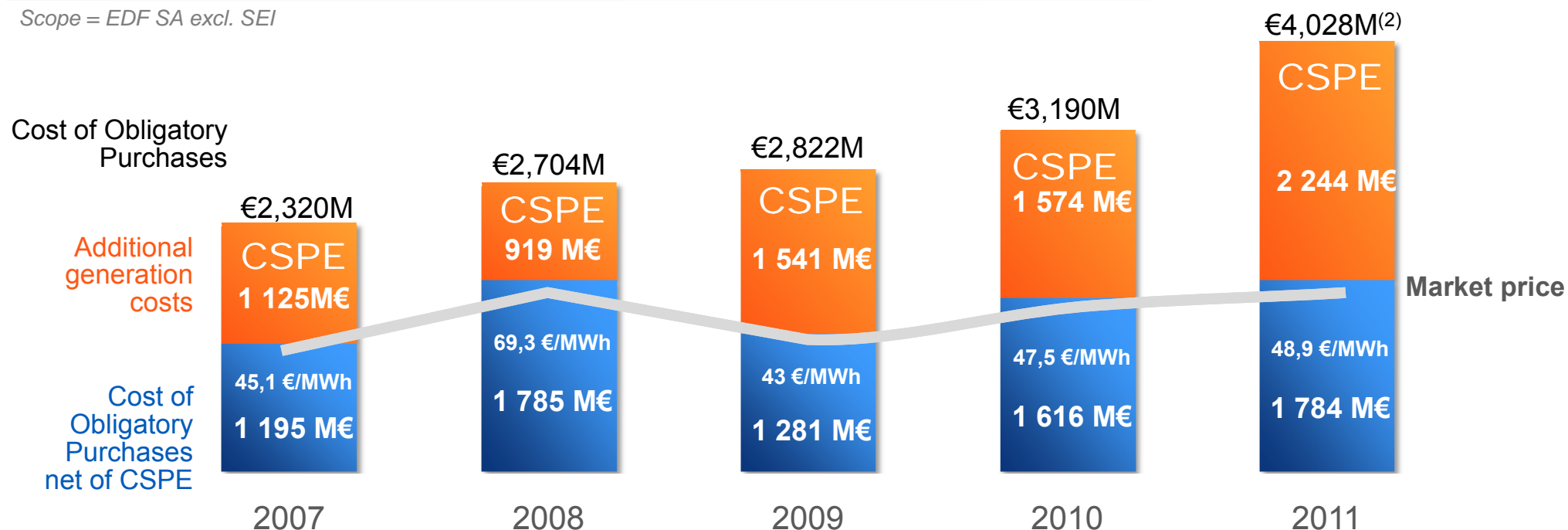
(2) Additional generation costs and purchase obligations in Corsica and the overseas departments, the TPN and the FSL

## Change in purchase obligations and the CSPE

**Principle :** The CSPE<sup>(1)</sup> offsets the difference between the cost of purchase obligations and spot market prices

The CSPE currently collected does not cover the higher cost of purchase obligations

Scope = EDF SA excl. SEI



(1) The CSPE also offsets generation costs in Corsica and the overseas departments as well as the TPN

(2) + €600M of purchases from photovoltaic and +€100M of purchases from wind vs. 2010

## CSPE in the 2011 financial statements

- Income statement:
  - Booked under "Other operating income and expenses<sup>(1)</sup>" for €3,556M (under an operating subsidy)
  - No impact on EBITDA
- Balance Sheet
  - Recorded with working capital under "other receivables" for €3,821M for expenses incurred by EDF and not yet offset by the CSPE
  - Increases net financial debt accordingly
- Cash Flow Statement
  - Cash-in: €2,547M
  - Increase in working capital requirements: €1,009M



# Impact of CSPE on EDF financial statements

*In millions of €*

	2009	2010	2011
<b>P&amp;L</b>			
Overcosts incurred through CSPE	(2,664)	(2,605)	(3,556)
Operating subsidy "Other operating income and expenses"	2,664	2,605	3,556
EBITDA	Neutral	Neutral	Neutral
<b>Balance Sheet</b>			
Receivable (Expenses– invoiced CSPE) " Other receivables"	1,844	2,812	3,821
Debt (CSPE on energy supplied but not yet invoiced) ; "Other payables"	(303)	(344)	(579)
<b>Cashflow statement</b>			
Cash-in	1,585	1,637	2,547
Increase in working capital requirement	1,079	968	1,009

The gap from the mechanism is borne by EDF and is determined on the basis of the energy delivered. It is booked as a receivable in Assets integrating the amount of CSPE billed to customers and a debt in Liabilities for the CSPE on energy delivered and the amount that remains to be charged.

# Year 2011

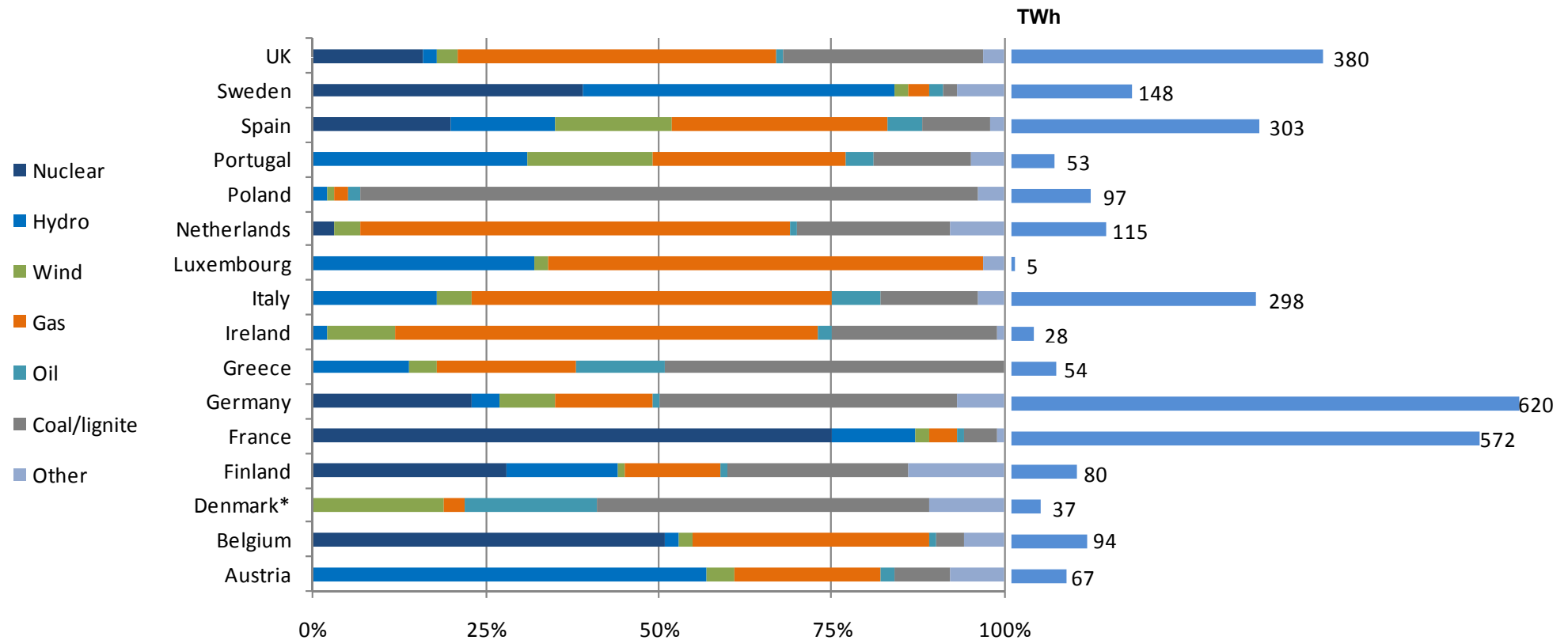
# Facts & Figures



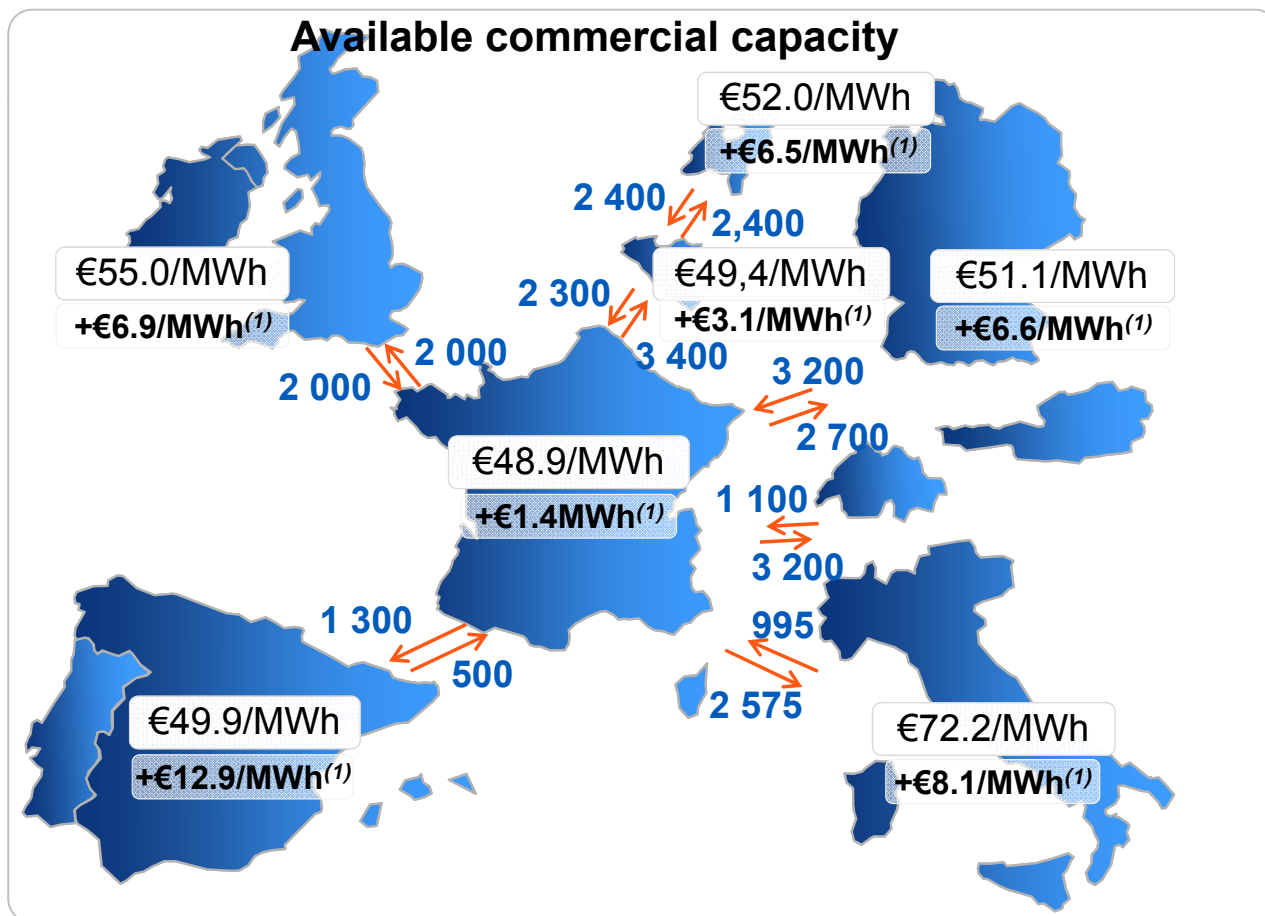
## Market data



# European Energy production mix

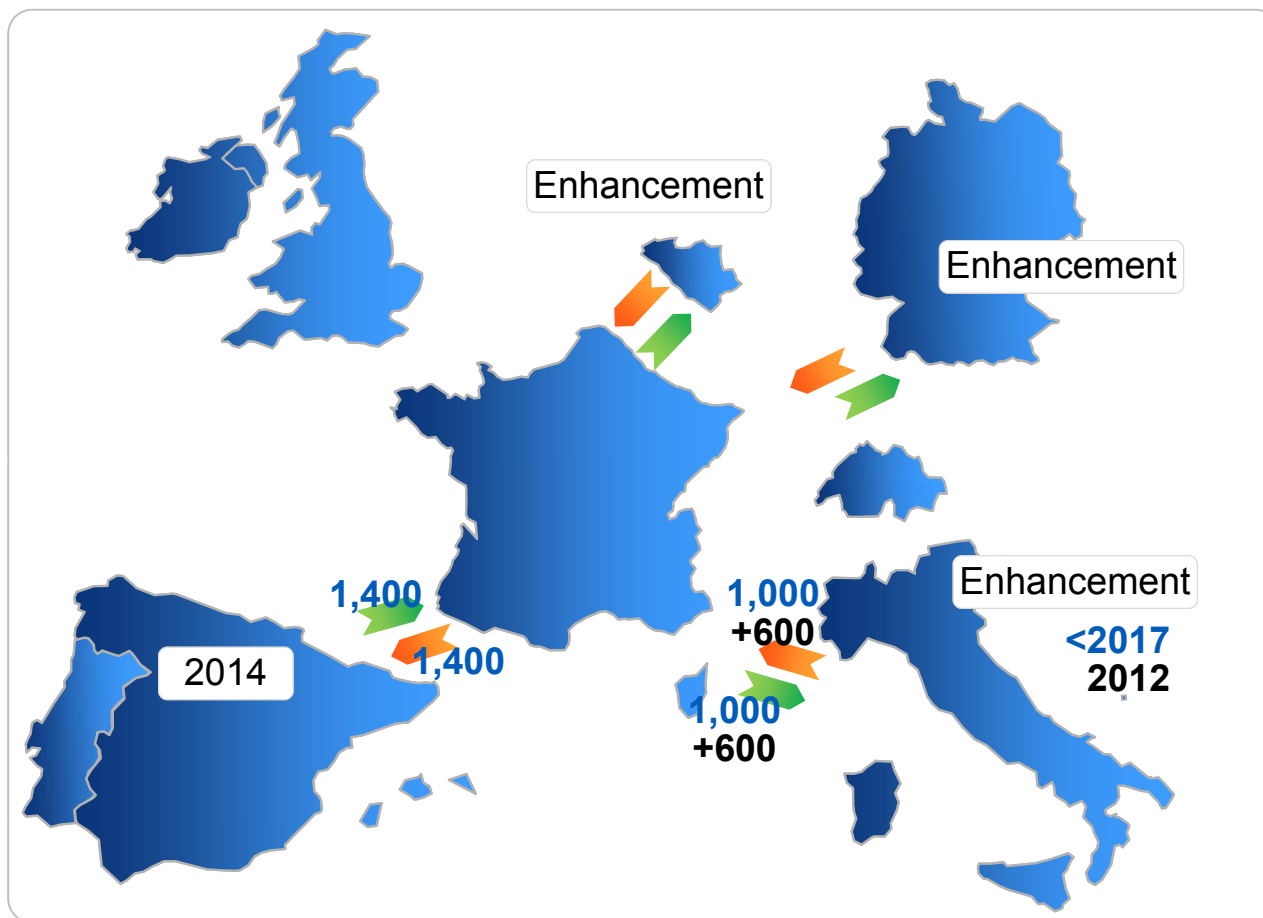


# European energy market still divided into "electric plates" - average prices in 2011 -



- Interconnected but distinct market zones
  - Interconnections: Commercial Capacity for winter 2010-11, estimated at 22/02/2011 (in MW, source ENTSOe)
  - Prices: average spot prices (base 2011) for France (Epex), Germany (Epex), the UK (EDFT), Spain (OMEL), the Netherlands (APX) and Italy (Ipex)

## Interconnection capacity increase planned



### ■ Interconnection addition

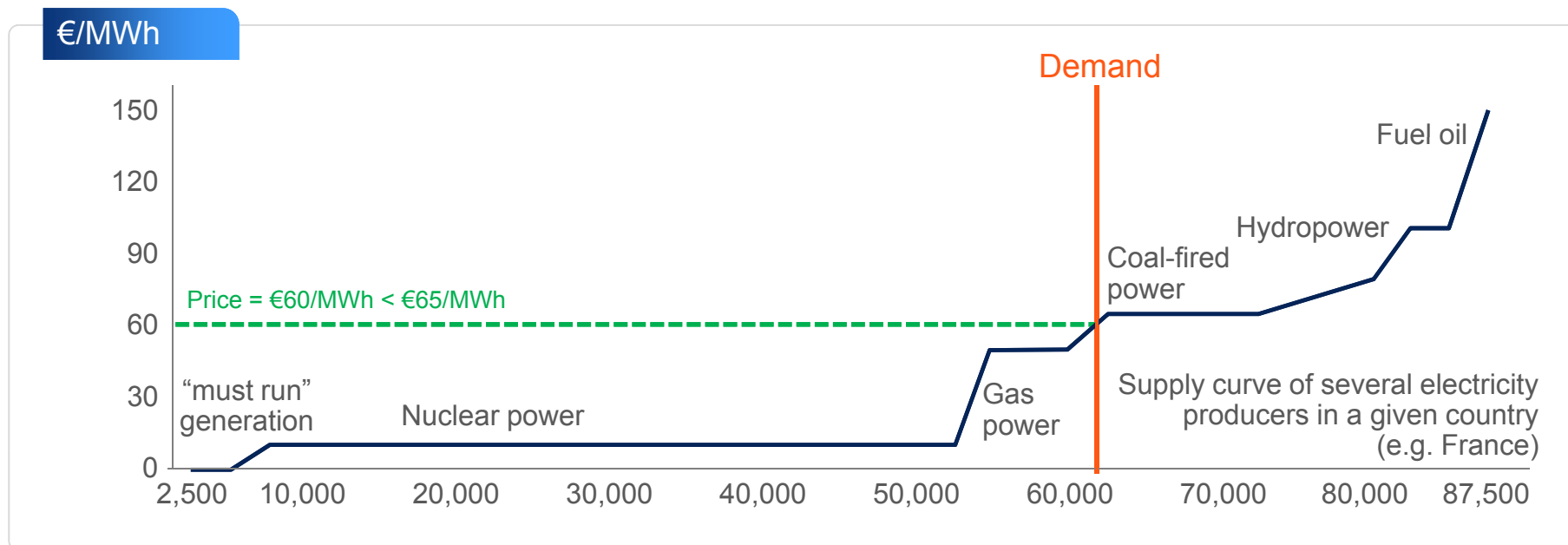
- France Spain:  
Baixas-Sta Llogaia  
(RTE –Project INELFE)
- France Italy  
Cornier Piosasco  
Grande Ile Piosasco  
(TERNA)

### ■ Enhancement:

- France Belgium  
Moulaine Aubange
- France Luxembourg  
Moulaine Belval
- France Belgium  
St Avold Ens Dorf

## Determination of the spot price

- In most European countries, spot electricity prices for the next day are established by fixing on the exchange:
  - Each producer determines the price-quantity ratio that it wants to sell and transmits it to the market operator
  - The market operator then groups all the producers' offers in order of increasing price
  - The same is done on the supply side
  - The spot electricity price for the next day is determined by taking the intersection of the supply curve and the demand curve (assumed here not to be price-sensitive)

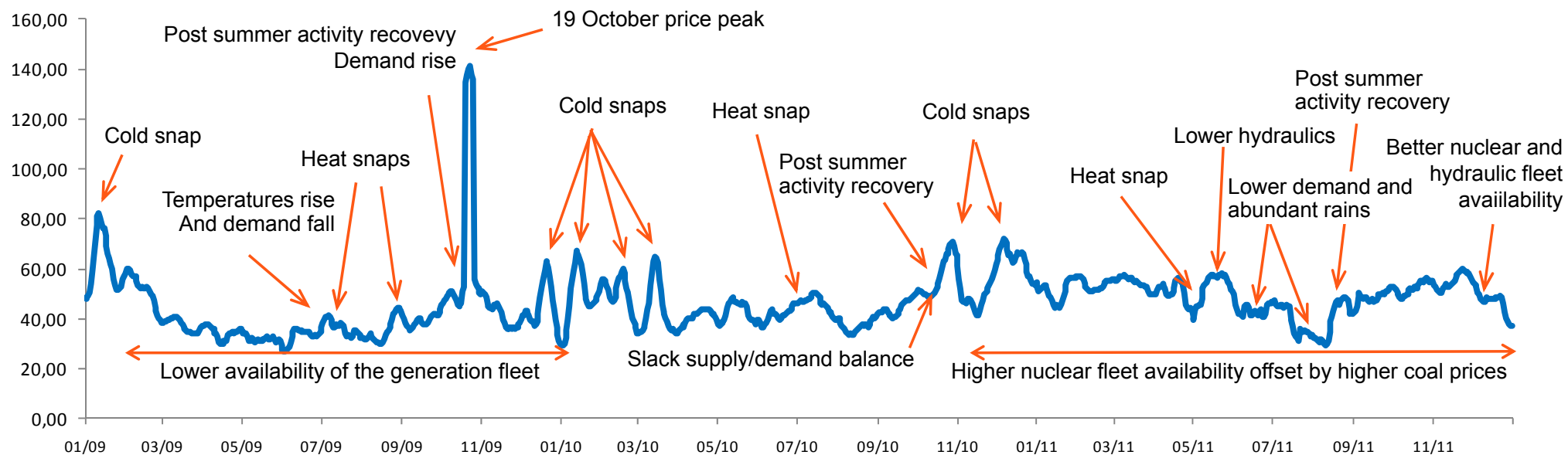


## Spot price history (France)

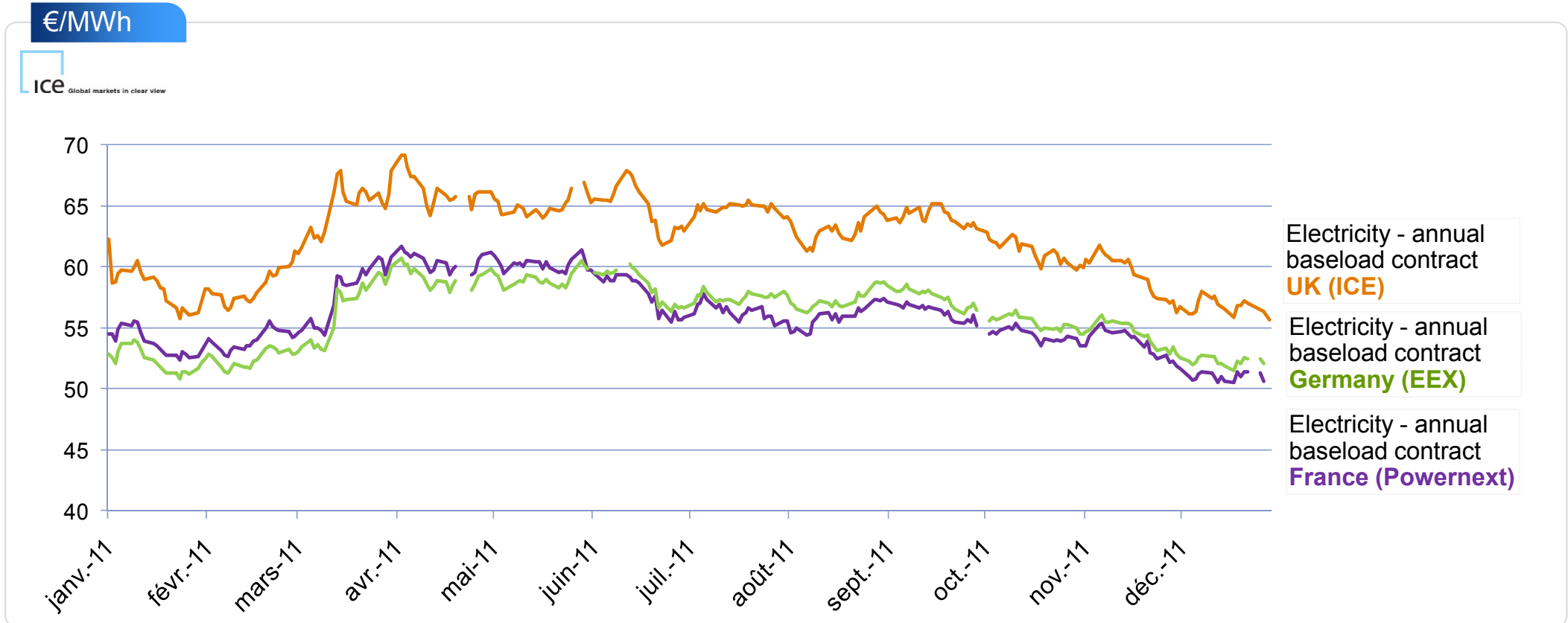
- The determination of the spot price is therefore closely linked to several factors:

- the level of demand
- the availability of generation fleets and demand management
- fossil fuel prices
- the country's energy mix

### Spot price since 2009 (7 day moving average)



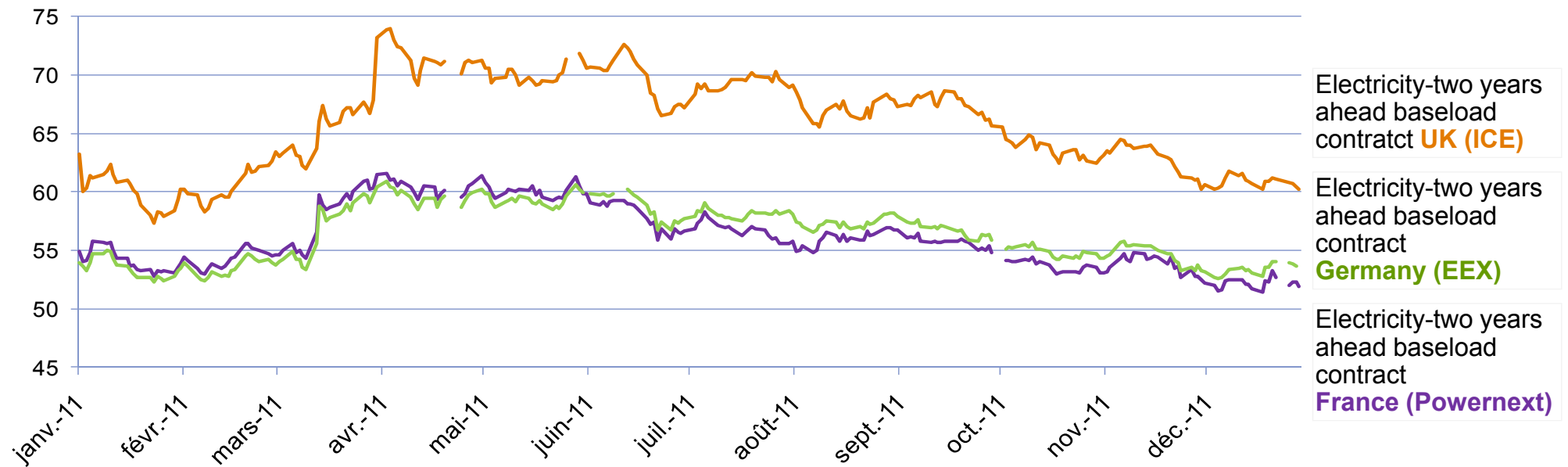
# 1-year forward price of baseload electricity in Europe





## 2-year forward price of baseload electricity in Europe

€/MWh

Ice  
Global markets in clear view

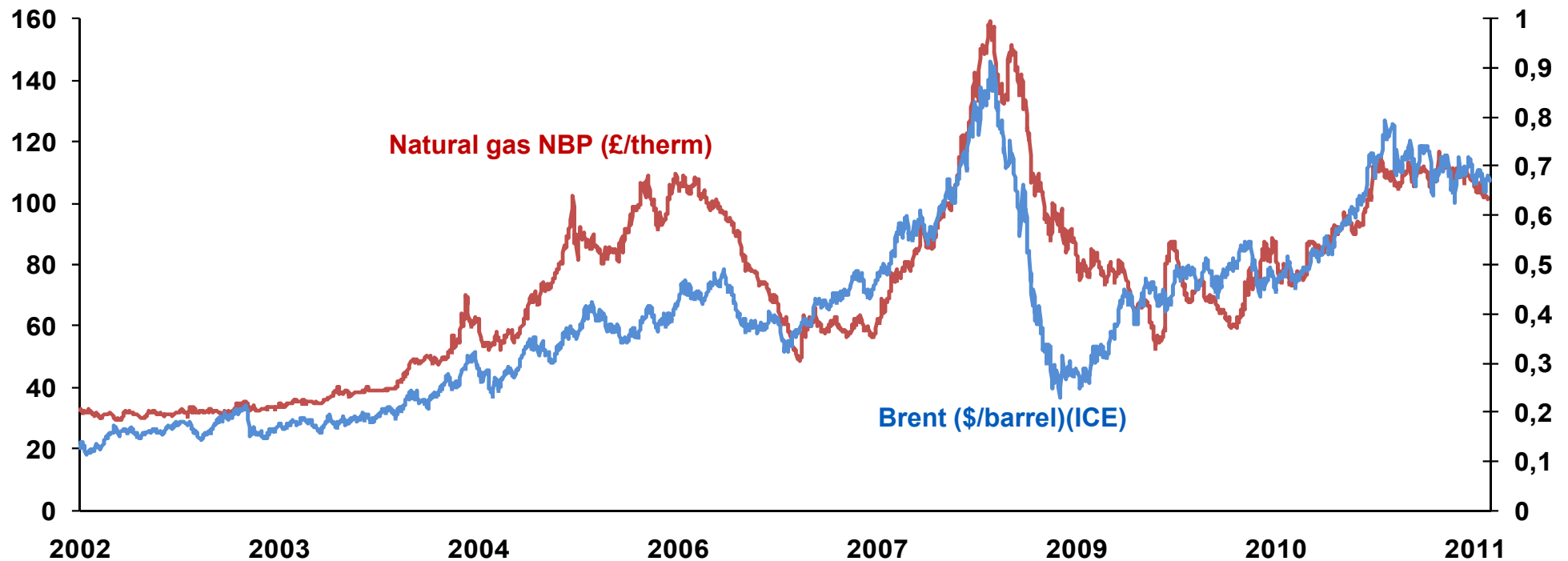
# Gas & oil prices

peut-on avoir les  
données jusque 31 dec  
2011

\$/bl

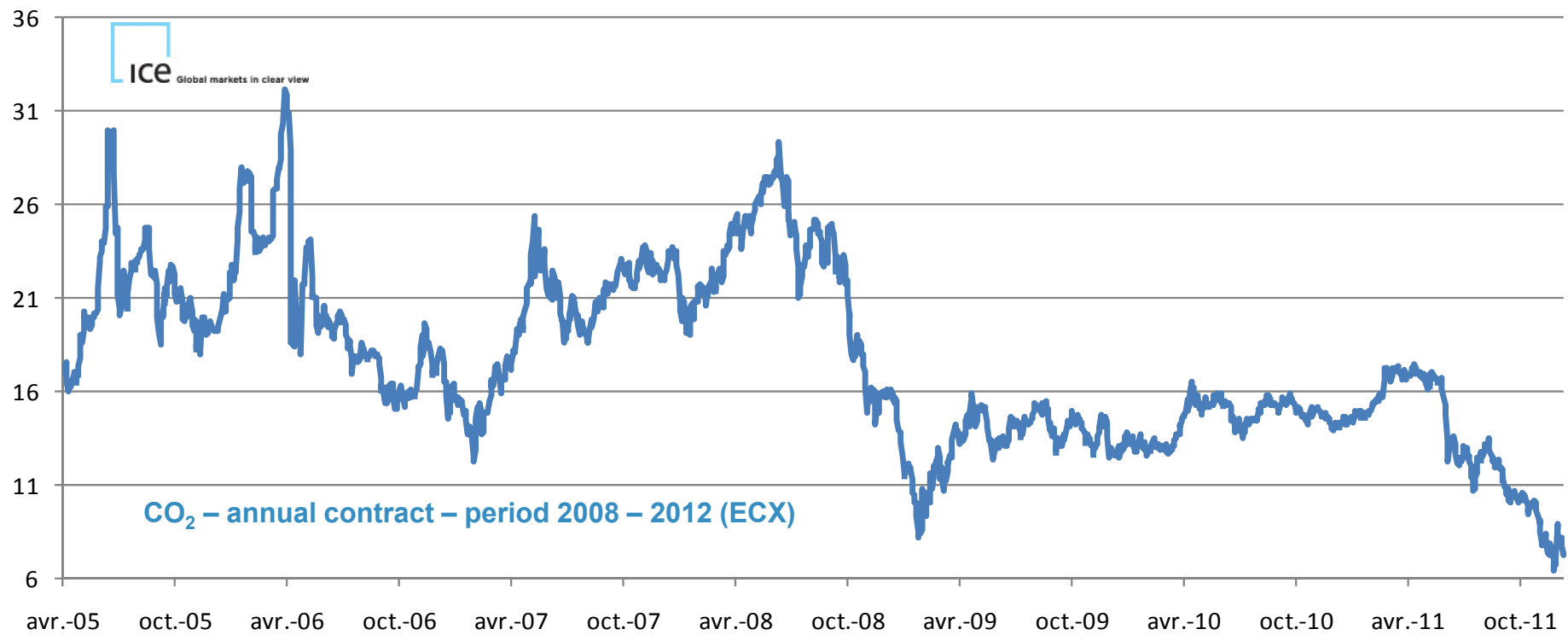
£/therm

ICE  
Global markets in clear view



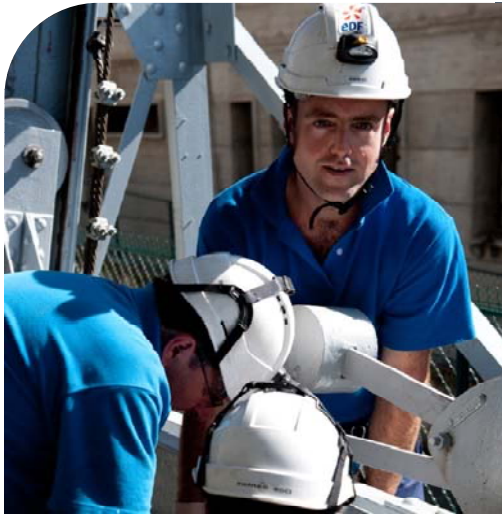
## Prices of CO<sub>2</sub> emissions quotas

€/t



# Year 2011

# Facts & Figures



## Appendices



The EDF Group

EDF main businesses

EDF within the energy sector  
and derived strategy

Financials

Market data

Appendices

## Financial calendar

31 July 2012



**Half-year Results 2012**

13 November 2012



**Sales (3<sup>rd</sup> Quarter 2012)**

14 February 2013



**Annual Results 2012**

May 2013



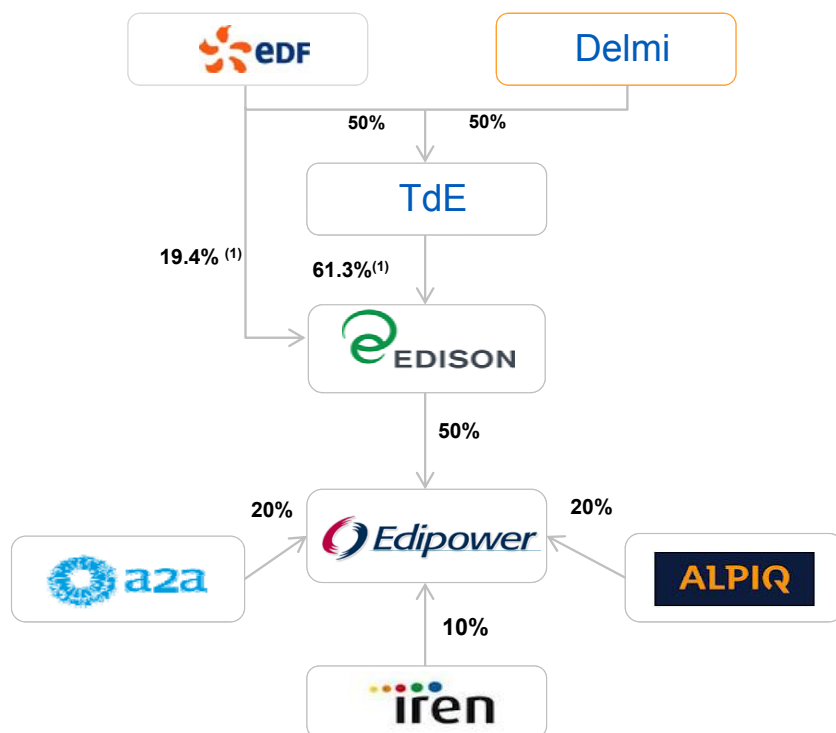
**Sales (1<sup>st</sup> Quarter 2013)**  
**General Shareholders' meeting**

## Renewable energies: purchase obligations

Type of energy	Latest decrees	Contracts' length	Example of tariffs for installations coming online at the decree's date
Hydro	1 March 2007	20 years	<ul style="list-style-type: none"> <li>6.07 c€/kWh + bonus between 0.5 and 2.5c€/kWh for small installations + bonus between 0 et 1.68 c€/kWh in Winter, depending on production's steadiness</li> <li>15 c€/kWh for ocean energy</li> </ul>
Wind	17 November 2008	depending, see nearby	<ul style="list-style-type: none"> <li>onshore wind : 8.2 c€/kWh for 10 years, then between 2.8 and 8.2 c€/kWh for 5 years depending on locations</li> <li>offshore wind : 13 c€/kWh for 10 years, then between 3 et 13 c€/kWh for 10 years according on locations</li> </ul>
PV	4 March 2011	20 years	<p><b>Tariffs applicable to projects for which connection requests were made</b></p> <ul style="list-style-type: none"> <li>tariff for installations integrated within the roof or building: 46, 40.6, 40.25 or 35.2 c€/kWh according to building use and power of installation</li> <li>tariff for simplified installations integrated within the roof or building : 30.35 or 28.85 c€/kWh</li> <li>other installations : 12c€/kWh</li> </ul> <p><b>Tariffs applicable to projects for which connection requests were made between 1 July 2011 and 30 September 2011</b></p> <ul style="list-style-type: none"> <li>tariff for installations integrated within the roof or building : 42.55, 37.23, 36.74 or 31.85 c€/kWh according to building use and power of installation</li> <li>tariff for simplified installations integrated within the roof or building : 26.09 or 27.46 c€/kWh</li> <li>other installations : 11.688 c€/kWh</li> </ul>
Cogeneration	31 July 2011	12 years	<b>6.1 to 9.15 c€/kWh depending on gas prices, operating time and power of installations</b>

# Edison before transaction and after transaction

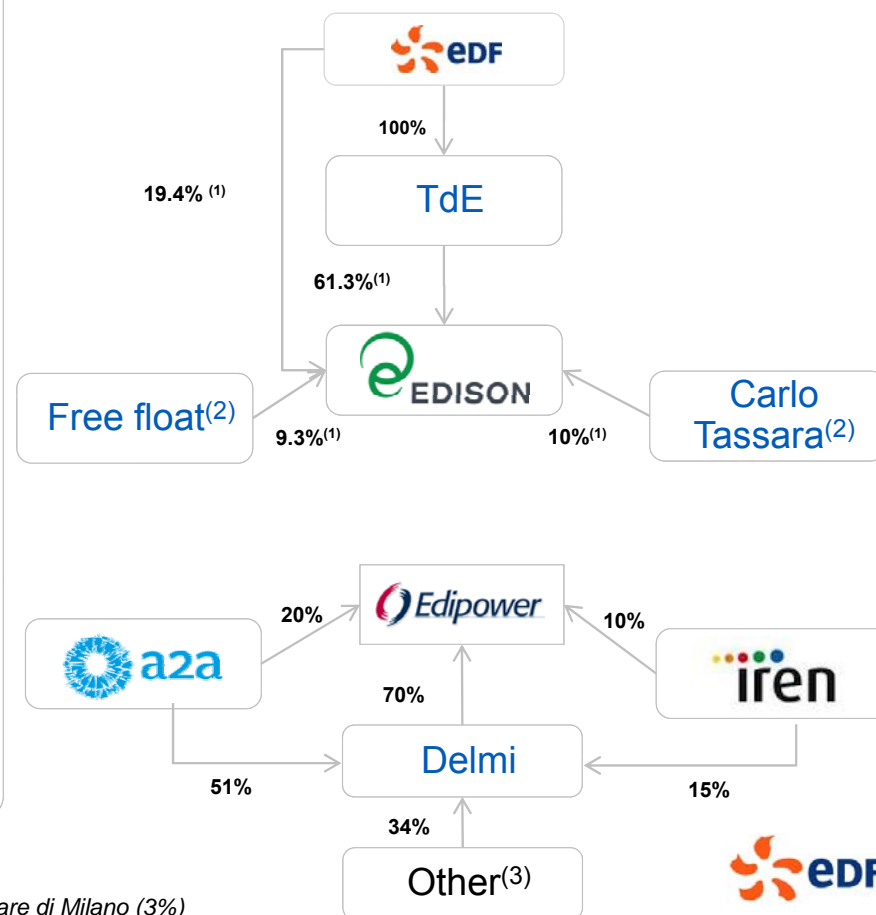
## Edison today



## Key steps

- Acquisition of Delmi's 50% interest in TdE by EDF
- Exclusive control of Edison by EDF (80.65%-owned)
- Disposal by Edison of 50% of Edipower
- MTO on Edison's minority interests at €0.84 per share

## Edison post industrial & shareholder reorganisation<sup>(1)</sup>



(1) % shown correspond to voting rights

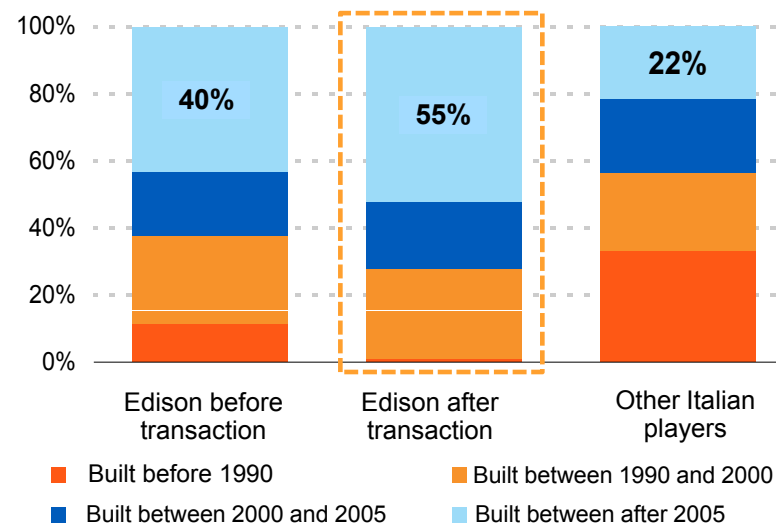
(2) Assuming no shares tendered as part of any potential MTO

(3) Other shareholders: Dolomiti Energia (10%) / SEL (10%) / Mediobanca (6%) / Fondazione CRT (5%) / Banca Popolare di Milano (3%)

## Edison generation net capacity in Italy post-transaction

- 2<sup>nd</sup> largest gas company in Italy with 15bcm purchased and 11bcm sold to third parties
- 3<sup>rd</sup> electric company in Italy with 7.0 GW<sup>(2)</sup> of fully-controlled capacity
- 1.4 million end customers in Italy, balanced between gas and electricity

A young asset base that performs



A more competitive energy mix that complements EDF's mix

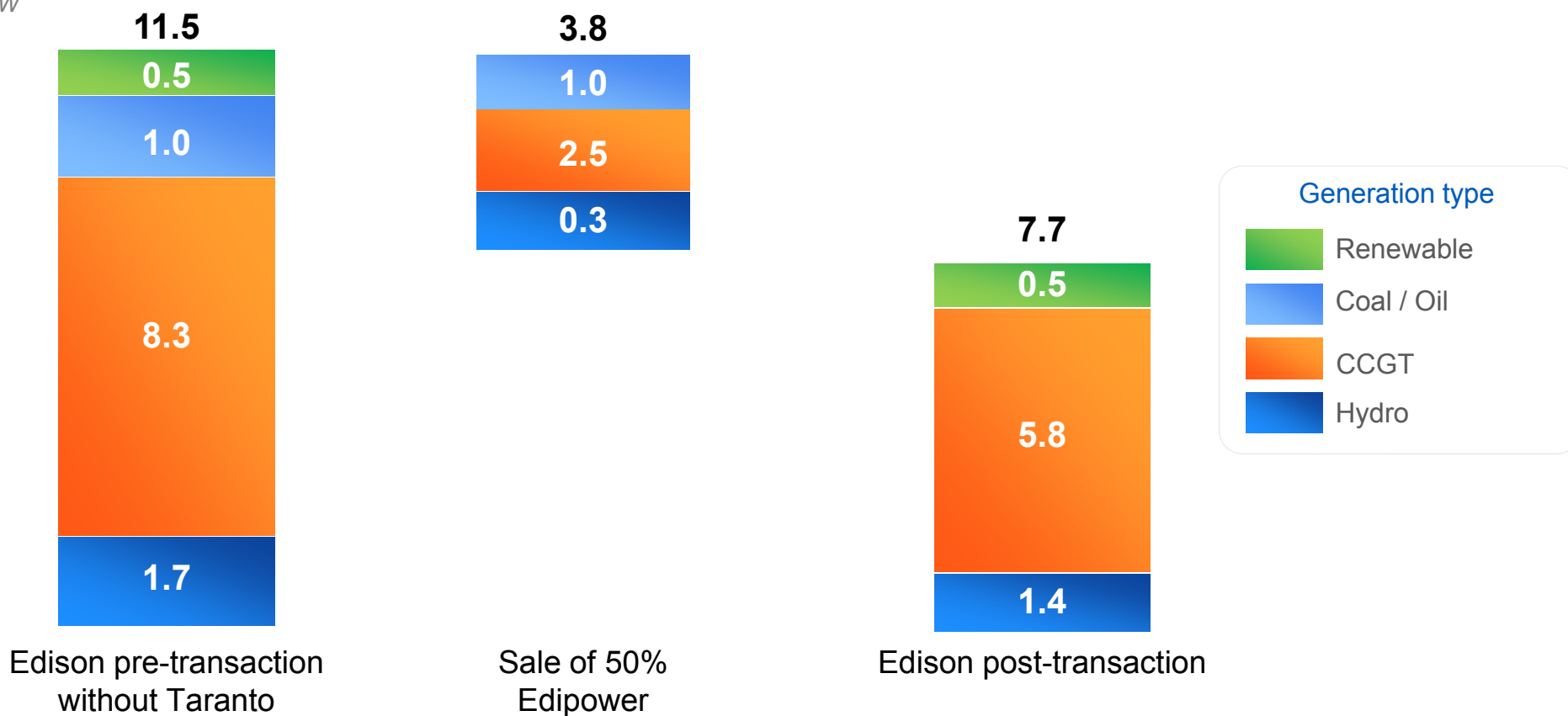
(1) Including Acea, A2A, Edipower, Enel, ENI and E.On

(2) 7.7 GW including activities excluding Italy



# Edison generation net capacity in Italy post-transaction

Net capacity in GW



# Edison's hydrocarbons activities

## Exploration & Production (E&P)

- Strong position, mainly as an operator: Italy, Egypt, Norway
- Significant growth potential through exploration in core zones and to a lesser extent in new zones
  - Successful historic exploration effort with reserves replacement of 143% in the 5 past years
  - Expertise in quality exploration and in ponds similar to today's most attractive areas: Iraq, West Africa
- High engineering capacities and E & P expertise
- Reserves as at end-2011: 49,8bcme
- 2010 gas / oil production: 2.8bcme

Exploration: a fundamental axis of the growth strategy of Edison in E&P



Current core zones



Expansion of core zones

# Edison, a strategic hydrocarbon positioning



Edison headquarters and representation



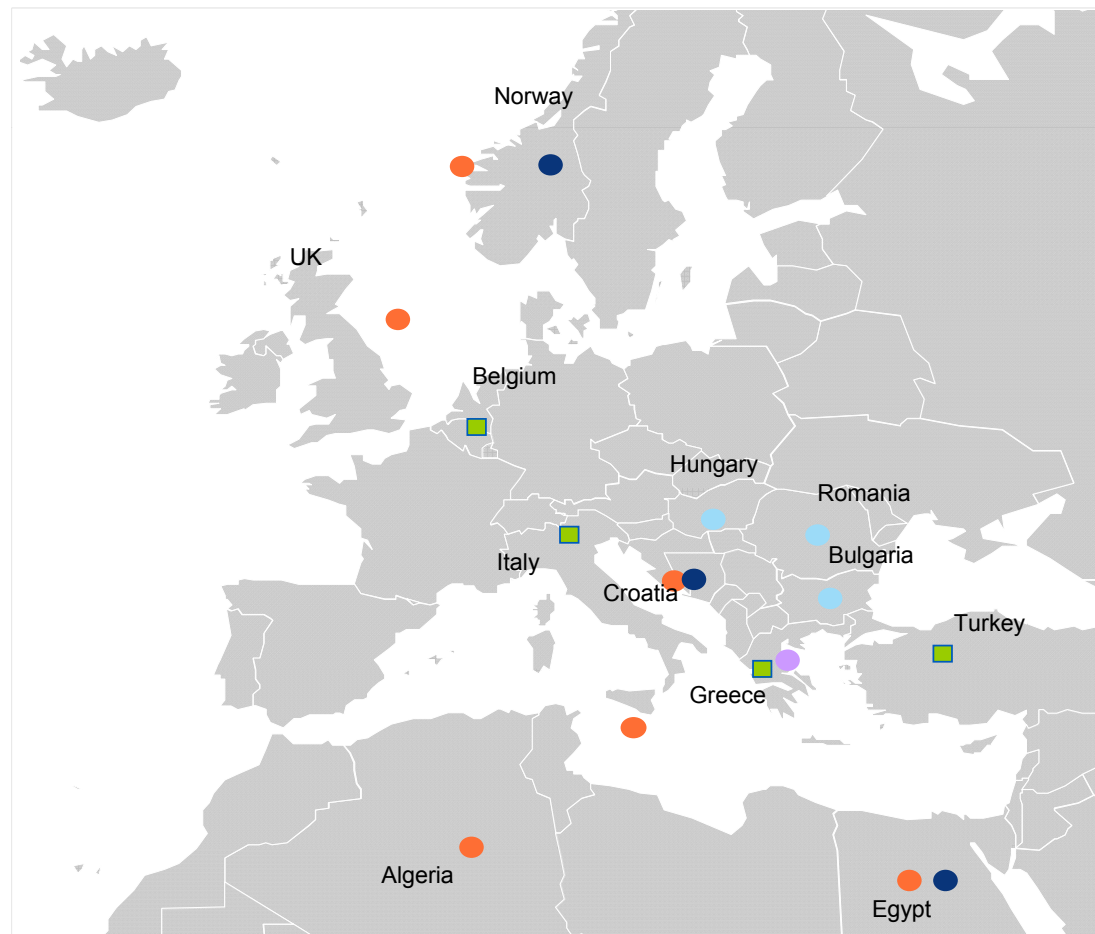
Hydrocarbon concession



Trading branch



Hydrocarbon branch



# Edison Italian gas assets

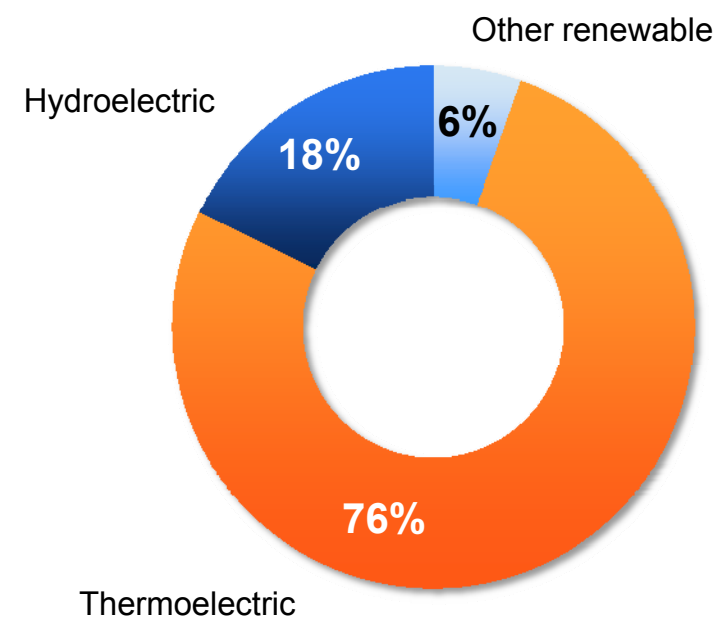
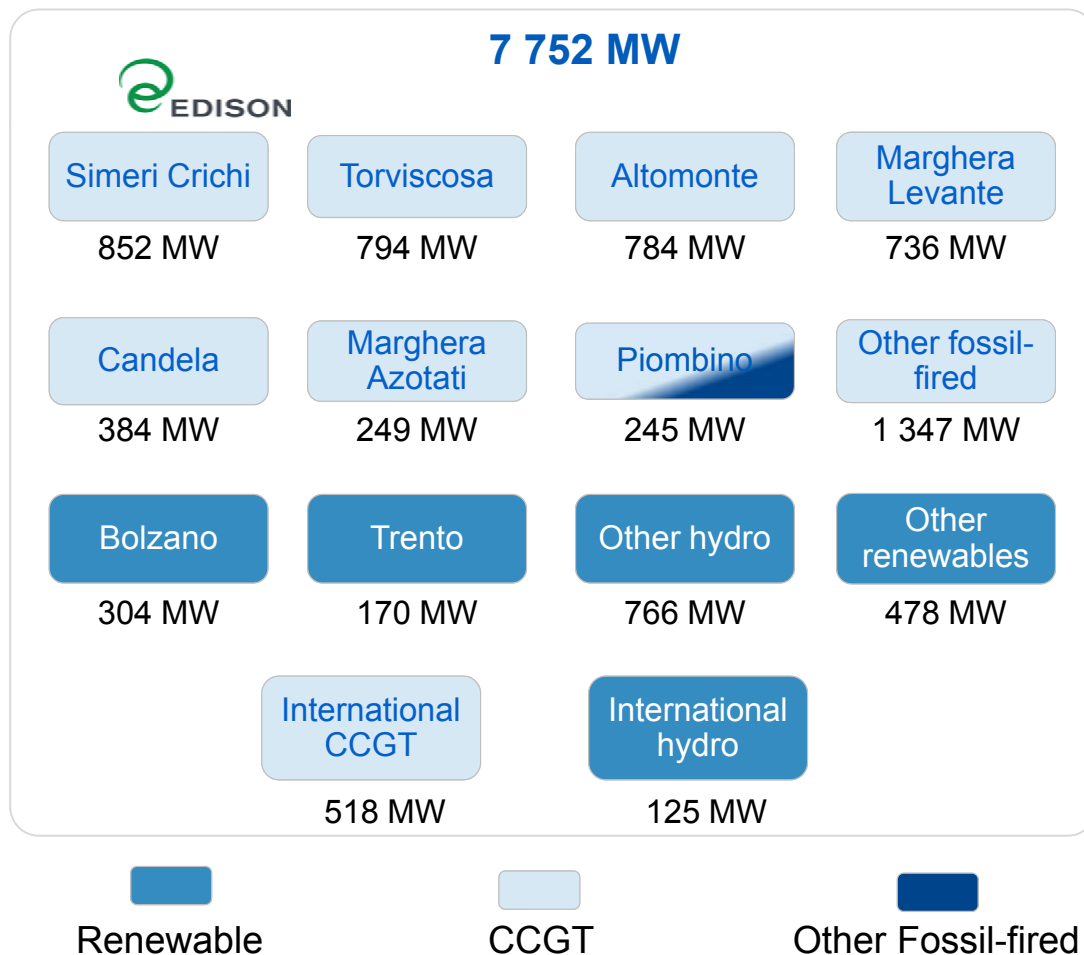
524,000 clients in Italy



## Edison's gas activity

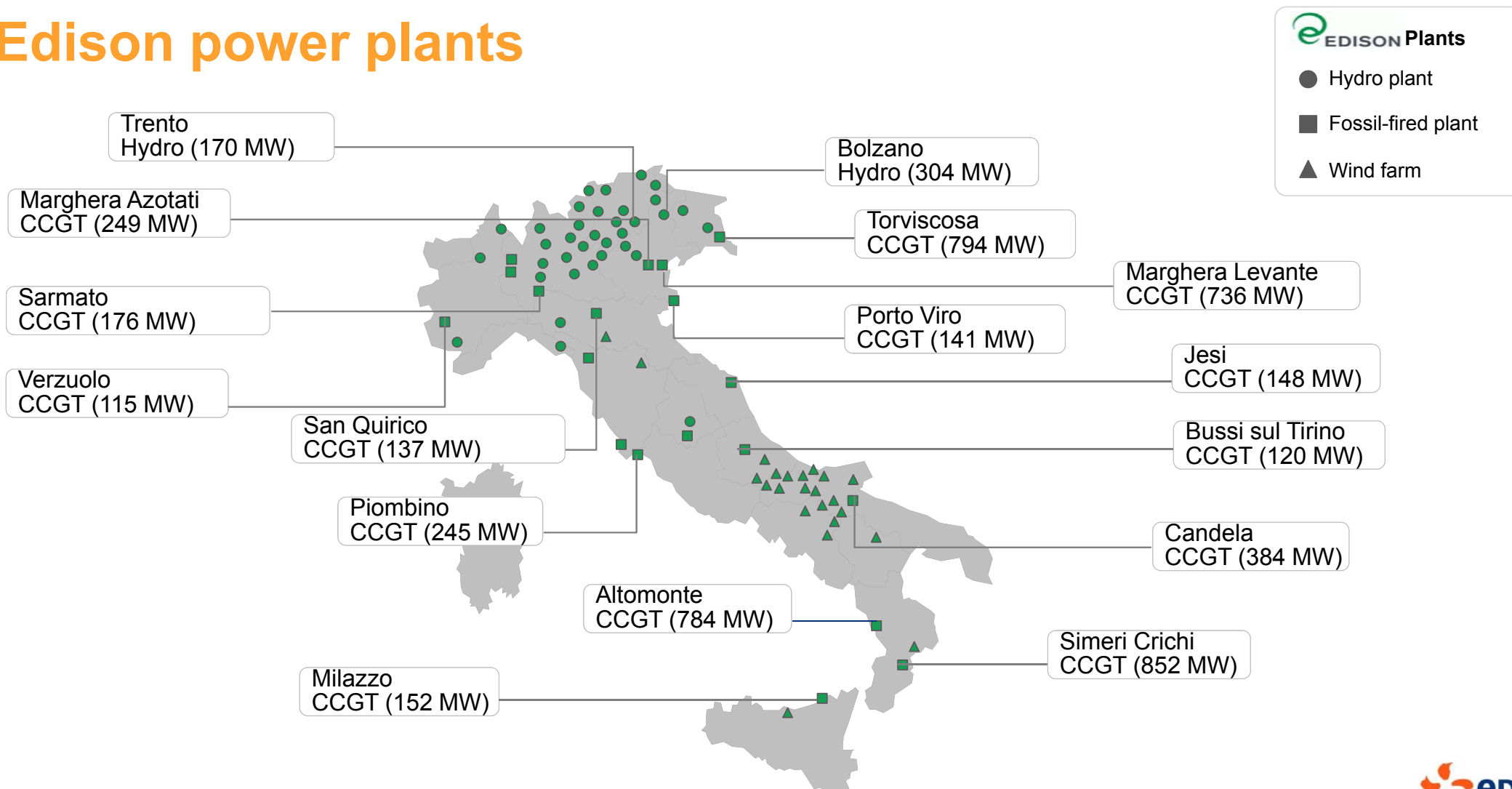
- 2 gas storage centres
  - Cellino
  - Collalto
- 1 gas storage centre in development
  - San Potito-Cotignola
- 1 LNG terminal: Adriatico
- Gas infrastructure projects:
  - ITGI Poseidon and Galsi
- 2010 importations per pipeline+LNG: 11.8 bcm
- 2010 Domestic purchasing: 2.7 bcm

## Edison's fleet – Figures as at 31 December 2011



**847,000 clients in Italy**

# Edison power plants



## List of thermal and nuclear assets (1/11)

Area	Country	Company	Name	Technology	Gross capacity (MW)	Commissioned	EDF Stake (%)	Consolidation
France	France	EDF	Fessenheim 1	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Fessenheim 2	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Bugey 2	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Bugey 3	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Bugey 4	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Bugey 5	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Dampierre 1	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Gravelines 1	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Gravelines 2	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Tricastin 1	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Tricastin 2	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Dampierre 2	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Dampierre 3	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Dampierre 4	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Tricastin 3	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Tricastin 4	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Gravelines 3	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Gravelines 4	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Blayais 1	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Blayais 2	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Blayais 3	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Blayais 4	Nuke	900	yes	100%	Parent Cie
France	France	EDF	St Laurent 1	Nuke	900	yes	100%	Parent Cie
France	France	EDF	St Laurent 2	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Chino B1	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Cruas 1	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Chino B2	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Cruas 2	Nuke	900	yes	100%	Parent Cie

## List of thermal and nuclear assets (2/11)

Area	Country	Company	Name	Technology	Gross capacity (MW)	Commissioned	EDF Stake (%)	Consolidation
France	France	EDF	Gravelines 5	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Gravelines 6	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Cruas 3	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Cruas 4	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Chino B3	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Chino B4	Nuke	900	yes	100%	Parent Cie
France	France	EDF	Paluel 1	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	Paluel 2	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	Paluel 3	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	Paluel 4	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	St Alban 1	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	Flamanville 1	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	St Alban 2	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	Flamanville 2	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	Cattenom 1	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	Cattenom 2	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	Nogent 1	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	Belleville 1	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	Belleville 2	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	Nogent 2	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	Penly 1	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	Cattenom 3	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	Golfech 1	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	Cattenom 4	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	Penly 2	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	Golfech 2	Nuke	1300	yes	100%	Parent Cie
France	France	EDF	Chooz B1	Nuke	1450	yes	100%	Parent Cie
France	France	EDF	Chooz B2	Nuke	1450	yes	100%	Parent Cie



## List of thermal and nuclear assets (3/11)

Area	Country	Company	Name	Technology	Gross capacity (MW)	Commissioned	EDF Stake (%)	Consolidation
France	France	EDF	Civaux 1	Nuke	1500	yes	100%	Parent Cie
France	France	EDF	Civaux 2	Nuke	1500	yes	100%	Parent Cie
France	France	EDF	Le Havre 1	Thermal	250	yes	100%	Parent Cie
France	France	EDF	Le Havre 2	Thermal	600	yes	100%	Parent Cie
France	France	EDF	Le Havre 4	Thermal	600	yes	100%	Parent Cie
France	France	EDF	Bouchain 1	Thermal	250	yes	100%	Parent Cie
France	France	EDF	Vitry sur Seine 3	Thermal	600	yes	100%	Parent Cie
France	France	EDF	Vitry sur Seine 4	Thermal	600	yes	100%	Parent Cie
France	France	EDF	Porcheville 1	Thermal	600	yes	100%	Parent Cie
France	France	EDF	Porcheville 2	Thermal	600	yes	100%	Parent Cie
France	France	EDF	Porcheville 3	Thermal	600	yes	100%	Parent Cie
France	France	EDF	Porcheville 4	Thermal	600	yes	100%	Parent Cie
France	France	EDF	Dirino 1	Thermal	85	yes	100%	Parent Cie
France	France	EDF	Dirino 2	Thermal	85	yes	100%	Parent Cie
France	France	EDF	Brennilis 2	Thermal	125	yes	100%	Parent Cie
France	France	EDF	Brennilis 3	Thermal	85	yes	100%	Parent Cie
France	France	EDF	Brennilis 4	Thermal	85	yes	100%	Parent Cie
France	France	EDF	Gennevilliers	Thermal	210	yes	100%	Parent Cie
France	France	EDF	Vaires sur Marne 1	Thermal	185	yes	100%	Parent Cie
France	France	EDF	Vaires sur Marne 2	Thermal	185	yes	100%	Parent Cie
France	France	EDF	Vaires sur Marne 3	Thermal	185	yes	100%	Parent Cie
France	France	EDF	Arrighi 1	Thermal	125	yes	100%	Parent Cie
France	France	EDF	Arrighi 2	Thermal	125	yes	100%	Parent Cie
France	France	EDF	Montereau 1	Thermal	185	yes	100%	Parent Cie
France	France	EDF	Montereau 2	Thermal	185	yes	100%	Parent Cie
France	France	EDF	Cordemais 2	Thermal	700	yes	100%	Parent Cie
France	France	EDF	Cordemais 3	Thermal	700	yes	100%	Parent Cie
France	France	EDF	Cordemais 4	Thermal	600	yes	100%	Parent Cie

## List of thermal and nuclear assets (4/11)

Area	Country	Company	Name	Technology	Gross capacity (MW)	Commissioned	EDF Stake (%)	Consolidation
France	France	EDF	Cordemais 5	Thermal	600	yes	100%	Parent Cie
France	France	EDF	Blénod 2	Thermal	250	yes	100%	Parent Cie
France	France	EDF	Blénod 3	Thermal	250	yes	100%	Parent Cie
France	France	EDF	Blénod 4	Thermal	250	yes	100%	Parent Cie
France	France	EDF	Blénod 5	Thermal	430	yes	100%	Parent Cie
France	France	EDF	Vitry sur Seine 3	Thermal	250	yes	100%	Parent Cie
France	France	EDF	Vitry sur Seine 4	Thermal	250	yes	100%	Parent Cie
France	France	EDF	La Maxe 1	Thermal	250	yes	100%	Parent Cie
France	France	EDF	La Maxe 2	Thermal	250	yes	100%	Parent Cie
France	France	EDF	Aramon 1	Thermal	700	yes	100%	Parent Cie
France	France	EDF	Aramon 2	Thermal	700	yes	100%	Parent Cie
France	France	EDF	Martigues 1	Thermal	250 (project to convert 2 fuel plants into 2 CCGT of 465 MW each. Hence 2 plants stopped. Commissioning date for the CCGTs aexpected in 2012)	yes	100%	Parent Cie
France	France	EDF	Martigues 2	Thermal	250	yes	100%	Parent Cie
France	France	EDF	Martigues 3	Thermal	250	yes	100%	Parent Cie
France	France	EDF	Genvilleillers	Thermal	203	yes	100%	Parent Cie
France	France	EDF	Dirino 1	Thermal	85	yes	100%	Parent Cie
France	France	EDF	Dirino 2	Thermal	85	yes	100%	Parent Cie
France (SEI)	Corsica	EDF	Le Vazzio	Thermal	136.5	yes	100%	Parent Cie
France (SEI)	Corsica	EDF	Lucciana	Thermal	55	yes	100%	Parent Cie
France (SEI)	Corsica	EDF	Lucciana	Thermal	76	yes	100%	Parent Cie

## List of thermal and nuclear assets (5/11)

Area	Country	Company	Name	Technology	Gross capacity (MW)	Commissioned	EDF Stake (%)	Consolidation
France (SEI)	Guyane	EDF	Kourou	Thermal	22	yes	100%	Parent Cie
France (SEI)	Guyane	EDF	MarProportionalasoula	Thermal	1 830 kVa	yes	100%	Parent Cie
France (SEI)	Guyane	EDF	Régina	Thermal	170 kVa	yes	100%	Parent Cie
France (SEI)	Guyane	EDF	Saül	Thermal	100 kVa	yes	100%	Parent Cie
France (SEI)	Guyane	EDF	Apatou	Thermal	850 kVa	yes	100%	Parent Cie
France (SEI)	Guyane	EDF	Grand Santi	Thermal	605 kVa	yes	100%	Parent Cie
France (SEI)	Guyane	EDF	Apagui	Thermal	40 kVa	yes	100%	Parent Cie
France (SEI)	Guyane	EDF	Monfina	Thermal	40 kVa	yes	100%	Parent Cie
France (SEI)	Guyane	EDF	Papaïchton	Thermal	1 075 kVa	yes	100%	Parent Cie
France (SEI)	Guyane	EDF	Camopi	Thermal	285 kVa	yes	100%	Parent Cie
France (SEI)	Guyane	EDF	Saint-Georges	Thermal	1 930 kVa	yes	100%	Parent Cie
France (SEI)	Guyane	EDF	Ouanary	Thermal	170 kVa	yes	100%	Parent Cie
France (SEI)	Guyane	EDF	Dégrad des Cannes	Thermal	42	yes	100%	Parent Cie
France (SEI)	Guyane	EDF	Dégrad des Cannes	Thermal	42	yes	100%	Parent Cie
France (SEI)	Guadeloupe	EDF	Energies Saint-Martin	Thermal	14.3	yes	100%	Parent Cie
France (SEI)	Guadeloupe	EDF	Saint-Martin	Thermal	39	yes	100%	Parent Cie
France (SEI)	Guadeloupe	EDF	Saint-Barthélemy	Thermal	23.1	yes	100%	Parent Cie
France (SEI)	Guadeloupe	EDF	Le Moule	Thermal	64	yes	100%	Parent Cie
France (SEI)	Guadeloupe	EDF	Energies Antilles	Thermal	16	yes	100%	Parent Cie
France (SEI)	Guadeloupe	EDF	Jarry Nord	Thermal	167.2	yes	100%	Parent Cie
France (SEI)	Guadeloupe	EDF	Jarry Sud	Thermal	102	yes	100%	Parent Cie
France (SEI)	Guadeloupe	EDF	La Désirade	Thermal	0.9	yes	100%	Parent Cie
France (SEI)	Guadeloupe	EDF	Terre de Bas	Thermal	2	yes	100%	Parent Cie
France (SEI)	Guadeloupe	EDF	Folle Anse	Thermal	7.1	yes	100%	Parent Cie
France (SEI)	Martinique	EDF	Pointe des Carrières	Thermal	81	yes	100%	Parent Cie
France (SEI)	Martinique	EDF	Pointe des Carrières	Thermal	48	yes	100%	Parent Cie
France (SEI)	Martinique	EDF	SARA	Thermal	4.8	yes	100%	Parent Cie
France (SEI)	Martinique	EDF	Galion	Thermal	40	yes	100%	Parent Cie

## List of thermal and nuclear assets (6/11)

Area	Country	Company	Name	Technology	Gross capacity (MW)	Commissioned	EDF Stake (%)	Consolidation
France (SEI)	Martinique	EDF	Bellefontaine	Thermal	199	yes	100%	Parent Cie
France (SEI)	Martinique	EDF	Bellefontaine	Thermal	23	yes	100%	Parent Cie
France (SEI)	St-Pierre et Miquelon	EDF	Miquelon	Thermal	6	yes	100%	Parent Cie
France (SEI)	St-Pierre et Miquelon	EDF	St-Pierre	Thermal	21	yes	100%	Parent Cie
France (SEI)	Réunion	EDF	Le Port	Thermal	125	yes	100%	Parent Cie
France (SEI)	Réunion	EDF	Le Port	Thermal	60	yes	100%	Parent Cie
France (SEI)	Réunion	EDF	Le Gol	Thermal	110	yes	100%	Parent Cie
France (SEI)	Réunion	EDF	Bois Rouge	Thermal	100	yes	100%	Parent Cie
France (PEI)	Réunion	EDF	Port Est	Thermal	220	no	100%	Parent Cie
France (PEI)	Corsica	EDF	Lucciana B	Thermal	128	no	100%	Parent Cie
France (PEI)	Martinique	EDF	Bellefontaine B	Thermal	220	no	100%	Parent Cie
France(PEI)	Guadeloupe	EDF	Pointe-Jarry	Thermal	220	no	100%	Parent Cie
UK	UK	EDF Energy	Hinkley Point B	Nuke	870	yes	80%	Consolidation
UK	UK	EDF Energy	Hunterston B	Nuke	890	yes	80%	Consolidation
UK	UK	EDF Energy	Dungeness B	Nuke	1040	yes	80%	Consolidation
UK	UK	EDF Energy	Heysham 1	Nuke	1160	yes	80%	Consolidation
UK	UK	EDF Energy	Hartlepool	Nuke	1190	yes	80%	Consolidation
UK	UK	EDF Energy	Torness	Nuke	1205	yes	80%	Consolidation
UK	UK	EDF Energy	Heysham 2	Nuke	1210	yes	80%	Consolidation
UK	UK	EDF Energy	Sizewell B	Nuke	1191	yes	80%	Consolidation
UK	UK	EDF Energy	Hinkley Point C	Nuke	1600	no	80%	Consolidation
UK	UK	EDF Energy	Sizewell C	Nuke	1600	no	80%	Consolidation
UK	UK	EDF Energy	West Burton	Thermal	2052	yes	80%	Consolidation
UK	UK	EDF Energy	West Burton B	Thermal	1311	no	80%	Consolidation
UK	UK	EDF Energy	Cottam	Thermal	2000	yes	80%	Consolidation
Italy	Italy	Edison	San Quirico	Thermal	137	yes	48,96%	Proportional
Italy	Italy	Edison	Porto Viro	Thermal	140,7	yes	48,96%	Consolidation
Italy	Italy	Edison	Porcari	Thermal	97,4	yes	48,96%	Consolidation

## List of thermal and nuclear assets (7/11)

Area	Country	Company	Name	Technology	Gross capacity (MW)	Commissioned	EDF Stake (%)	Consolidation
Italy	Italy	Edison	Milazzo	Thermal	152,4	yes	29,38%	Consolidation
Italy	Italy	Edison	Jesi	Thermal	148	yes	34,27%	Consolidation
Italy	Italy	Edison	Bussi sul Tirino	Thermal	133	yes	48,96%	Consolidation
Italy	Italy	Edison	Sesto san Giovanni	Thermal	50	yes	48,96%	Consolidation
Italy	Italy	Edison	Marghera Azotati	Thermal	249	yes	48,96%	Consolidation
Italy	Italy	Edison	Marghera Levante	Thermal	256	yes	48,96%	Consolidation
Italy	Italy	Edison	Piombino CET 2 Ise	Thermal	60	yes	48,96%	Consolidation
Italy	Italy	Edison	Marghera Levante	Thermal	479,8	yes	48,96%	Consolidation
Italy	Italy	Edison	Sarmato	Thermal	175,9	yes	48,96%	Consolidation
Italy	Italy	Edison	Terni	Thermal	98	yes	48,96%	Consolidation
Italy	Italy	Edison	Verzuolo	Thermal	115,4	yes	48,96%	Consolidation
Italy	Italy	Edison	Sesto San giovanni	Thermal	63	yes	48,96%	Consolidation
Italy	Italy	Edison	Candela	Thermal	384	yes	48,96%	Consolidation
Italy	Italy	Edison	Altomonte	Thermal	784	yes	48,96%	Consolidation
Italy	Italy	Edison	Torviscosa	Thermal	794	yes	48,96%	Consolidation
Italy	Italy	Edison	Simeri Crichi	Thermal	852,2	yes	48,96%	Consolidation
Italy	Italy	Edison	Cologno Monzese	Thermal	49	yes	31,82%	Consolidation
Italy	Italy	Edison	Piombino CET 3 Ise	Thermal	185	yes	48,96%	Consolidation
Italy	Brazil	Edison	Ibiritè	Thermal	226	yes	50,0%	Proportional
Italy	Greece	Edison	T-Power	Thermal	389	yes	50,0%	Proportional
Italy	Greece	Edison	Thisvi	Thermal	420	yes	50,0%	Consolidation
Other international	China	TNPJVC	Taishan phase 1 & 2	Nuke	3500	no	30,0%	Equity
Other international	China	DSPC	San Men Xia	Nuke	1200	yes	35,0%	Equity
Other international	China	SZPC	Shiheng	Thermal	1200	yes	19,6%	Equity
Other international	China	SZPC	Heze II	Thermal	600	yes	19,6%	Equity
Other international	China	SZPC	Liaocheng	Thermal	1200	yes	19,6%	Equity
Other international	China	FConsolidationlec	Laibin B	Thermal	720	yes	100,0%	Consolidation
Other international	Vietnam	MECO	Phu My 2-2	Thermal	715	yes	56,25%	Consolidation

## List of thermal and nuclear assets (8/11)

Area	Country	Company	Name	Technology	Gross capacity (MW)	Commissioned	EDF Stake (%)	Consolidation
Autre international	USA	CENG	R.E. Ginna	Nuke	581	yes	49,9%	Proportional
Autre international	USA	CENG	Calvert Cliff 1	Nuke	855	yes	49,9%	Proportional
Autre international	USA	CENG	Calvert Cliff 2	Nuke	850	yes	49,9%	Proportional
Autre international	USA	CENG	Nine Mile Point	Nuke	620	yes	49,9%	Proportional
Autre international	USA	CENG	Nine Mile Point 2	Nuke	1138	yes	49,9%	Proportional
Autre international	USA	EDF Trading	Energia	Thermal	82	yes	100%	Consolidation
Autre international	USA	CEG	Conemaugh steam turbine	Thermal	1711	yes	7,2%	N/A
Autre international	USA	CEG	Fore river	Thermal	801	yes	7,2%	N/A
Autre international	USA	CEG	HA Wagner	Thermal	414,7	yes	7,2%	N/A
Autre international	USA	CEG	Perryman	Thermal	353	yes	7,2%	N/A
Autre international	USA	CEG	West Valley	Thermal	200	yes	7,2%	N/A
Autre international	USA	CEG	ACE	Thermal	104	yes	7,2%	N/A
Autre international	USA	CEG	Norther Prairie	Thermal	93	yes	7,2%	N/A
Autre international	USA	CEG	Rio Bravo Jasmin	Thermal	39	yes	7,2%	N/A
Autre international	USA	CEG	HA Wagner	Thermal	16	yes	7,2%	N/A
Autre international	USA	CEG	Colorado Bend	Thermal	825	yes	7,2%	N/A
Autre international	USA	CEG	Quail Run Energy	Thermal	825	yes	7,2%	N/A
Autre international	USA	CEG	Riverside	Thermal	135	yes	7,2%	N/A
Autre international	USA	CEG	Philadelphia Road	Thermal	60	yes	7,2%	N/A
Autre international	USA	CEG	Sunnyside Cogeneration	Thermal	50	yes	7,2%	N/A
Autre international	USA	CEG	CP Crane Oil	Thermal	16	yes	7,2%	N/A
Autre international	Switzerland	Alpiq	Monthel (Electricité)	Thermal	55	yes	26,06%	Equity
Autre international	Switzerland	Alpiq	Monthel (Chaleur)	Thermal	43 MWth	yes	26,06%	Equity
Autre international	Switzerland	Alpiq	Gosgen	Nuke	985	yes	10,42%	Equity
Autre international	Switzerland	Alpiq	Leibstadt	Nuke	1165	yes	8,44%	Equity
Autre international	France	Alpiq	Bayet	Thermal	408	yes	26,06%	Equity
Autre international	France	Alpiq	Monchy-au-bois	Thermal	420	no	26,06%	Equity
Autre international	Germany	Alpiq	Spreetal	Thermal	55	yes	26,06%	Equity

## List of thermal and nuclear assets (9/11)

Area	Country	Company	Name	Technology	Gross capacity (MW)	Commissioned	EDF Stake (%)	Consolidation
Autre international	Spain	Alpiq	Plana del vent	Thermal	400	yes	26,06%	Equity
Autre international	Italy	Alpiq	San Severo	Thermal	400	yes	15,64%	Equity
Autre international	Italy	Alpiq	Biella power	Thermal	20	yes	15,64%	Equity
Autre international	Italy	Alpiq	Novel	Thermal	100	yes	13,29%	Equity
Autre international	Italy	Alpiq	Vercelli	Thermal	50	yes	24,76%	Equity
Autre international	Czech Republic	Alpiq	Kladno (Electricité)	Thermal	388	yes	26,06%	Equity
Autre international	Czech Republic	Alpiq	Kladno (Chaleur)	Thermal	272 MWth	yes	26,06%	Equity
Autre international	Czech Republic	Alpiq	Kladno II	Thermal	45	yes	26,06%	Equity
Autre international	Czech Republic	Alpiq	Zlin (Electricité)	Thermal	66	yes	26,06%	Equity
Autre international	Czech Republic	Alpiq	Zlin (Chaleur)	Thermal	377 MWth	yes	26,06%	Equity
Autre international	Hungary	Alpiq	Csepel (Electricité)	Thermal	403	yes	26,06%	Equity
Autre international	Hungary	Alpiq	Csepel (Chaleur)	Thermal	326 MWth	yes	26,06%	Equity
Autre international	Poland	EDF International	Rybnik1	Thermal	1775	yes	97,34%	Consolidation
Autre international	Poland	EDF International	Kogeneracja (Electricité)	Thermal	363	yes	50 (50% + 1 action)	Consolidation
Autre international	Poland	EDF International	Kogeneracja (Chaleur)	Thermal	1124 MWth	yes	50 (50% + 1 action)	Consolidation
Autre international	Poland	EDF International	EC Wybreze (Electricité)	Thermal	331	yes	99,7%	Consolidation
Autre international	Poland	EDF International	EC Wybreze (Chaleur)	Thermal	1199 MWth	yes	99,7%	Consolidation
Autre international	Poland	EDF International	EC Krakow (Electricité)	Thermal	460	yes	94,31%	Consolidation
Autre international	Poland	EDF International	EC Krakow (Chaleur)	Thermal	1118 MWth	yes	94,31%	Consolidation
Autre international	Poland	EDF International	EC Zielona Gora (Electricité)	Thermal	221	yes	39,93%	Consolidation
Autre international	Poland	EDF International	EC Zielona Gora (Chaleur)	Thermal	296 MWth	yes	39,93%	Consolidation
Autre international	Poland	EDF International	Rybnik2	Thermal	900	no	98,4%	Consolidation
Autre International	Brazil	UTE Norte-Fluminense	UTE Norte-Fluminense	Thermal	869	yes	90%	Consolidation
Autre International	Spain	Elcogas	Puertollano	Thermal	320	yes	31,48%	Proportional
Autre International	Austria	ESTAG	FHKW Graz	Thermal	57	yes	25%	Proportional
Autre International	Austria	ESTAG	CMST	Thermal	25	yes	25%	Proportional
Autre International	Austria	ESTAG	STGW Blockheizkraftwerke	Thermal	14	yes	25%	Proportional
Autre International	Belgium	EDF Belgium	Tihange 1	Nuke	962	yes	50%	N/A

## List of thermal and nuclear assets (10/11)

Area	Country	Company	Name	Technology	Gross capacity (MW)	Commissioned	EDF Stake (%)	Consolidation
Autre International	Belgium	EDF Luminus	Tihange 2	Nuke	1008	yes	10,19%	N/A
Autre International	Belgium	EDF Luminus	Tihange 3	Nuke	1015	yes	10,19%	N/A
Autre International	Belgium	EDF Luminus	Doel 3	Nuke	1006	yes	10,19%	N/A
Autre International	Belgium	EDF Luminus	Doel 4	Nuke	985	yes	10,19%	N/A
Autre International	Belgium	EDF Luminus	Monsin	Thermal	73,7	yes	63,5%	Consolidation
Autre International	Belgium	EDF Luminus	Harelbeke	Thermal	83	yes	63,5%	Consolidation
Autre International	Belgium	EDF Luminus	HAM-Gent Wkk	Thermal	55	yes	63,5%	Consolidation
Autre International	Belgium	EDF Luminus	Ham31	Thermal	55	yes	63,5%	Consolidation
Autre International	Belgium	EDF Luminus	Ham32	Thermal	55	yes	63,5%	Consolidation
Autre International	Belgium	EDF Luminus	Angleur TGV3	Thermal	117	yes	63,5%	Consolidation
Autre International	Belgium	EDF Luminus	Angleur TG41	Thermal	63	yes	63,5%	Consolidation
Autre International	Belgium	EDF Luminus	Angleur TG42	Thermal	63	yes	63,5%	Consolidation
Autre International	Belgium	EDF Luminus	Ringvaart	Thermal	357	yes	63,5%	Consolidation
Autre International	Belgium	EDF Luminus	Seraing	Thermal	485	yes	63,5%	Consolidation
Autre International	Belgium	EDF Luminus	Ham	Thermal	116	yes	63,5%	Consolidation
Autre International	Belgium	EDF Luminus	IZEGEM	Thermal	22	yes	63,5%	Consolidation
Autre International	Belgium	EDF Luminus	Navagne	Thermal	890	no	63,5%	Consolidation
Autre International	Belgium	EDF Luminus	Evergem	Thermal	890	no	63,5%	Consolidation
Autre International	Netherlands	SLOE Centrale BV	Sloe Centrale	Thermal	870	yes	50%	Proportional
Autre International	Hungary	BE ZRt	Kelenföld	Thermal	196	yes	95,6%	Consolidation
Autre International	Hungary	BE ZRt	Kispest	Thermal	114	yes	95,6%	Consolidation
Autre International	Hungary	BE ZRt	Újpest	Thermal	110	yes	95,6%	Consolidation
Autres activités	Belgium	EDF EN	Marche-en-Famenne	Biogaz	0,03	yes	100%	Consolidation
Autres activités	France	EDF EN	La Ciotat	Biogaz	1,2	yes	100%	Consolidation
Autres activités	France	EDF EN	Chagny	Biogaz	1,2	yes	100%	Consolidation
Autres activités	France	EDF EN	St Laurent de Cognac - Revico Energies	Biogaz	0,8	yes	50%	Proportional
Autres activités	France	EDF EN	Orange - Delta dechets	Biogaz	1	yes	100%	Consolidation
Autres activités	United States	EDF EN	Beacon	Biogaz	50	yes	100%	Consolidation



## List of thermal and nuclear assets (11/11)

Area	Country	Company	Name	Technology	Gross capacity (MW)	Commissioned	EDF Stake (%)	Consolidation
Other Activités	France	EDF EN	LDC	Biogaz	0,3	yes	51%	Consolidation
Other Activités	France	EDF EN	Calitom	Biogaz	0,8	yes	100%	Consolidation
Other Activités	France	EDF EN	Ikos - Fresnoy Folny	Biogaz	0,9	yes	100%	Consolidation
Other Activités	France	EDF EN	Semag - Gardanne	Biogaz	0,8	yes	100%	Consolidation
Other Activités	France	EDF EN	Gizay	Biogaz	0,8	yes	100%	Consolidation
Other Activités	France	EDF EN	Cogeri	Thermal	19,2	yes	35%	Equity
Other Activités	Spain	EDF EN	Lucena - Cogeneration	Thermal	12,8	yes	70%	Consolidation
Other Activités	Spain	EDF EN	Lucena - Biomasse	Biomasse	13,2	yes	70%	Consolidation
Other Activités	France	EDF EN	Ikos - Bimont	Biogaz	0,78	no	100%	Consolidation
Other Activités	France	EDF EN	Valensole	Biogaz	0,6	no	100%	Consolidation
Other Activités	France	EDF EN	Lely - Grenoble	Biogaz	2	no	100%	Consolidation
Other Activités	France	EDF EN	SMD3 - St Laurent des Hommes	Biogaz	0,6	no	100%	Consolidation
Other Activités	France	EDF EN	Valdis - Issé	Biogaz	2,13	no	100%	Consolidation
Other Activités	France	EDF EN	ORC	Biogaz	0,25	no	100%	Consolidation

## Glossary (1/5)

- **ANDRA:** the French law of December 30, 1991 established a public industrial and commercial body, the National Agency for the Management of Nuclear Waste (Agence nationale pour la gestion des déchets radioactifs “ANDRA”), responsible for the long-term management of radioactive waste. The Agency, which reports to the Ministers of Industry, Research and the Environment, established the storage centers based in the Aube region of France for the long-term management of short-life waste
- **APE:** the French Government Shareholding Agency (APE) is a national organization within the Ministry of Economy. Its mission is to act as a shareholder for the French Government in order to develop its assets and maximize the value of its stakes
- **Architect-Assembler:** for EDF, the architect-assembler has control over: the design and operation of its power plants; the organization of development projects; the schedule for completion and costs of construction; relations with the 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
- **ARENH:** regulated access to historical nuclear energy
- **ASN (Autorité de Sûreté Nucléaire):** the French Nuclear Safety Authority (Autorité de Sûreté Nucléaire or “ASN”) controls, nuclear safety and radioprotection in France, on behalf of the French government, to protect workers, patients, the public and the environmental risks associated with the use of nuclear energy. It is notably in charge of the external control of nuclear facilities in France. The French ASN is an independent administrative authority with a staff of more than 300. The French ASN is represented at the national level by the General Agency for Nuclear Safety and Radioprotection (or “DGSNR”)
- **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 1 (industrialized 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
- **CCGT:** Combined Cycle Gas Turbine

## Glossary (2/5)

- **Clean Dark spread:** difference between power price and variable generation cost (mainly coal cost and CO<sub>2</sub> cost)
- **Cogeneration:** generation technique for combined electricity and heat generation. 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%
- **Combined-Cycle Gas:** 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
- **COSO:** Committee of Sponsoring Organizations
- **CRE (Commission de Régulation de l'Énergie):** the French Energy Regulatory Commission (Commission de Régulation de l'Énergie, or "CRE") was created on March 30, 2000. The CRE, an independent body, regulates the process to open the energy market opening. It ensures that all of the generators and eligible customers have non-discriminatory access to the network. Within its jurisdiction, this body supervises and authorizes, settles any disputes and, if required, imposes sanctions
- **Distribution Networks:** downstream of the transmission network, medium- and low-tension distribution networks serve end-users (individuals, groups, SMEs, SMIs, etc.)
- **ELD:** local distribution companies that provide for distribution of gas and electricity on a delimited geographical area. The number of ELD in France is 170 and ensure 5% of electricity distribution
- **Electricity supply:** can be broken down into four types of consumption: "basic" (or "ribbon") supply is: the "basic" (or "ribbon") supply of electricity generated and consumed throughout the year; "semi-basic" supply is the electricity generated and consumed over the winter period; "peak" supply corresponds to periods of the year when electricity generation or supply is in heavy; demand; "lace" supply is a complement to "ribbon" supply
- **EPIC:** Industrial and Commercial state-owned Company

## Glossary (3/5)

- **ETS:** European Trading Scheme
- **European Pressurized Reactor (EPR):** 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
- **Fuel cycle:** 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: upstream: the processing of concentrates from uranium ore, the conversion, enrichment and production of fuel (which takes more than two years); 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); 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
- **Greenhouse emissions:** 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 October 13, 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 period from 2005-2007, 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)
- **Interconnection:** electricity transmission infrastructure that allows for exchanges of energy between different countries, by connecting the transmission network of one country to that of a neighboring country
- **LNG (Liquefied Natural Gas):** natural gas turned into liquid form by reducing its temperature to –162C allowing for a reduction by 600 in its volume
- **Metering:** 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)

## Glossary (4/5)

- **MEDEF:** French companies association
- **Midstream:** 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 predetermined capacity, procurement contracts, etc.). The midstream segment includes the trading and negotiating activities
- **National Quota Allocation Plan:** this plan defines the total quantity of greenhouse gas emission quotas that the French state 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
- **Nox:** nitrogen oxide
- **Nuclear tranche:** electrical generation 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
- **Nuclear safety:** nuclear safety includes all of the technical, organizational 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)
- **Ofgem:** Ofgem is the Office of the Gas and Electricity Markets in the UK. Its main missions consist in protecting consumers, regulating gas and electricity monopoly companies, helping to secure Britain's energy supplies by promoting and regulating competitive gas and electricity markets, as well as contributing to the drive to curb climate change and other work aimed at sustainable development
- **Plant availability:** 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 x 8,760 hr. The Kd, which counts only technical non-availability, i.e., scheduled shutdowns, unplanned outages and testing periods, characterizes a plant's industrial performance. For EDF's nuclear fleet in France, the maximum theoretical generation capacity is of 553 TWh (63.1 GW X 8,760 h)
- **PPA:** Price Purchase Agreement

## Glossary (5/5)

- **PWR:** Pressurized Water Reactors constitute a large majority of all western nuclear power plants. In a PWR, the primary coolant (water) is pumped under high pressure to the reactor core where it is heated by the energy generated by the fission of atoms. The heated water then flows to a steam generator where it transfers its thermal energy to a secondary system where steam is generated and flows to turbines which, in turn, spins an electric generator. In contrast to a boiling water reactor (BWR), pressure in the primary coolant loop prevents the water from boiling within the reactor
- **Renewable energies:** energies for which generation does not require extinction of the initial resource. They largely derive from geothermal, water, air, fire and solar sources. They include hydro, wind, solar (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
- **RTE:** RTE is the operator of the French electricity transmission system. A public service company, RTE operates, maintains and develops the high and very high voltage network
- **SOx:** sulfur Oxid
- **Storage:** 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 risks control.
- **Storage center:** low- or medium-level short-life radioactive waste, from nuclear plants, the Hague or Centraco facilities, are sent to ANDRA's Soulaines storage center in the Aube region, which has been operational since 1992. This center has capacity of 1,000,000 m<sup>3</sup>, and acceptance capacity of approximately 60 years. Very low-level short-life radioactive waste is sent to ANDRA's Morvilliers storage center (also in the Aube region). This center was commissioned in October 2003 and has an operating life of about 30 years
- **Transmission networks:** 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)
- **Waste:** the nuclear generation of 1 MWh of electricity (equivalent to the monthly consumption of two households) produces around 11 g of total waste across all categories. Short-life waste represents more than 90% of the total, but contains only 0.1% of the radioactivity of waste. Depending upon their level of radioactivity, this type of waste is subdivided into two different categories: very low-level waste and low-level waste; long-life medium and high level waste are produced in low quantity, less than 10% of the total quantity but they contains almost all of the radioactivity of the waste (99.9%)

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# Year 2011

# Facts & Figures

