CONSOLIDATED
FINANCIAL STATEMENTS
AT 31 DECEMBER 2018

Consolidated income statement

(in millions of euros)	Notes	2018	2017 restated [1]
Sales	7	68,976	64,892
Fuel and energy purchases	8	(33,012)	(32,901)
Other external expenses	9	(9,364)	(8,739)
Personnel expenses	10	(13,690)	(12,456)
Taxes other than income taxes	11	(3,697)	(3,541)
Other operating income and expenses	12	6,052	6,487
Operating profit before depreciation and amortisation		**15,265**	**13,742**
Net changes in fair value on Energy and Commodity derivatives, excluding trading activities		(224)	(355)
Net depreciation and amortisation		(9,006)	(8,537)
Net increases in provisions for renewal of property, plant and equipment operated under concessions		(50)	(58)
(Impairment)/reversals	13	(598)	(518)
Other income and expenses	14	(105)	1,363
Operating profit		**5,282**	**5,637**
Cost of gross financial indebtedness	15.1	(1,716)	(1,778)
Discount effect	15.2	(3,486)	(2,959)
Other financial income and expenses	15.3	393	2,501
Financial result	15	**(4,809)**	**(2,236)**
Income before taxes of consolidated companies		**473**	**3,401**
Income taxes	16	149	(147)
Share in net income of associates and joint ventures	23	569	35
CONSOLIDATED NET INCOME		1,191	3,289
EDF net income		**1,177**	**3,173**
Net income attributable to non-controlling interests		**14**	**116**
Earnings per share (EDF share) in euros:	17		
Basic earnings per share		**0.20**	**0.98**
Diluted earnings per share		**0.20**	**0.98**

(1) The comparative figures at 31 December 2017 have been restated according to IFRS 15 (note 2.1). For IFRS 9, applicable from 1 January 2018, the comparative figures have not been restated, as allowed by the standard's transition measures.

Consolidated statement of comprehensive income

(in millions of euros)	2018			2017		
	EDF net income	Net income attributable to non-controlling interests	Total	EDF net income	Net income attributable to non-controlling interests	Total
Group net income	**1,177**	**14**	**1,191**	**3,173**	**116**	**3,289**
Gross change in fair value of hedging instruments [1]	34	(19)	15	1,513	4	1,517
Related tax effect	(89)	-	(89)	(361)	(2)	(363)
Associates' and joint ventures' share of fair value of hedging instruments	(7)	-	(7)	6	-	6
Change in fair value of hedging instruments	**(62)**	**(19)**	**(81)**	***1,158***	***2***	***1,160***
Translation adjustments – controlled entities	(38)	(79)	(117)	(970)	(169)	(1,139)
Translation adjustments – associates and joint ventures	117	-	117	(531)	-	(531)
Translation adjustments	***79***	***(79)***	**-**	***(1,501)***	***(169)***	***(1,670)***
Gross change in fair value of debt instruments [1] [2]	(115)	-	(115)	-	-	-
Related tax effect	42	-	42	-	-	-
Associates' and joint ventures' share of fair value of debt instruments	(1)	-	(1)	-	-	-
Gross change in fair value of available-for-sale financial assets [1]	-	-	-	107	-	107
Related tax effect	-	-	-	(61)	-	(61)
Associates' and joint ventures' share of fair value of available-for-sale financial assets	-	-	-	77	-	77
Change in fair value of debt instruments and available-for-sale financial assets	(74)	-	**(74)**	*123*	-	***123***
Gains and losses recorded in equity with recycling	**(57)**	**(98)**	**(155)**	**(220)**	**(167)**	**(387)**
Gross change in fair value of equity instruments [2]	**(37)**	**-**	**(37)**	-	-	-
Related tax effect	**-**	**-**	**-**	-	-	-
Associates' and joint ventures' share of fair value of equity instruments	**-**	**-**	**-**	-	-	-
Change in fair value of equity instruments	**(37)**	**-**	**(37)**	-	-	-
Gross change in actuarial gains and losses on post-employment benefits [3]	3,141	11	3,152	1,061	60	1,121
Related tax effect	(309)	(1)	(310)	(337)	(12)	(349)
Associates' and joint ventures' share of change in actuarial gains and losses on post-employment benefits	69	-	69	16	-	16
Change in actuarial gains and losses on post-employment benefits	***2,901***	***10***	***2,911***	***740***	***48***	***788***
Gains and losses recorded in equity with no recycling	**2,864**	**10**	**2,874**	**740**	**48**	**788**
Total gains and losses recorded in equity	**2,807**	**(88)**	**2,719**	**520**	**(119)**	**401**
CONSOLIDATED COMPREHENSIVE INCOME	**3,984**	**(74)**	**3,910**	**3,693**	**(3)**	**3,690**

(1) Gross changes in fair value recycled to profit and loss in respect of debt and equity securities and hedging instruments are presented in notes 36.2 and 41.4.

(2) In accordance with the transition measures of IFRS 9, the comparative figures have not been restated. See note 2.2, for more details on these transition measures.

(3) Gross changes in actuarial gains and losses are presented in note 31.1.2.

Consolidated balance sheet

ASSETS *(in millions of euros)*	Notes	31/12/2018	31/12/17 restated (1)
Goodwill	18	10,195	10,036
Other intangible assets	19	9,918	8,896
Property, plant and equipment operated under French public electricity distribution concessions	20	56,515	54,739
Property, plant and equipment operated under concessions for other activities	21	7,339	7,607
Property, plant and equipment used in generation and other tangible assets owned by the Group	22	78,252	75,622
Investments in associates and joint ventures	23	8,287	7,249
Non-current financial assets	36	37,104	36,787
Other non-current receivables	26	1,796	2,168
Deferred tax assets	16.3	978	1,220
Non-current assets		**210,384**	**204,324**
Inventories	24	14,227	14,138
Trade receivables	25	15,910	16,843
Current financial assets	36	31,143	24,953
Current tax assets		869	673
Other current receivables	26	7,346	7,219
Cash and cash equivalents	37	3,290	3,692
Current assets		**72,785**	**67,518**
Assets classified as held for sale	43	-	-
TOTAL ASSETS		283,169	271,842

EQUITY AND LIABILITIES *(in millions of euros)*	Notes	31/12/2018	31/12/17 restated (1)
Capital	27	1,505	1,464
EDF net income and consolidated reserves		42,964	39,893
Equity (EDF share)		***44,469***	***41,357***
Equity (non-controlling interests)	27.5	8,177	7,341
Total equity	27	**52,646**	**48,698**
Provisions related to nuclear generation – back-end of the nuclear cycle, plant decommissioning and last cores	28	49,204	46,410
Other provisions for decommissioning	28	2,033	1,977
Provisions for employee benefits	31	17,627	20,630
Other provisions	28	2,908	2,356
Non-current provisions	28	***71,772***	***71,373***
Special French public electricity distribution concession liabilities	33	46,924	46,323
Non-current financial liabilities	38	52,129	51,365
Other non-current liabilities	35	4,896	4,864
Deferred tax liabilities	16.3	1,987	2,362
Non-current liabilities		**177,708**	**176,287**
Current provisions	28	6,010	5,484
Trade payables	34	13,421	13,994
Current financial liabilities	38	17,167	11,142
Current tax liabilities		205	187
Other current liabilities	35	16,012	16,050
Current liabilities		**52,815**	**46,857**
Liabilities related to assets classified as held for sale	43	-	-
TOTAL EQUITY AND LIABILITIES		283,169	271,842

(1) The comparative figures at 31 December 2017 have been restated according to IFRS 15 (note 2.1.3.2).

Consolidated cash flow statement

(in millions of euros)	Notes	2018	2017
Operating activities:			
Income before taxes of consolidated companies		**473**	**3,401**
Impairment/(reversals)		598	518
Accumulated depreciation and amortisation, provisions and changes in fair value		13,180	9,980
Financial income and expenses		729	764
Dividends received from associates and joint ventures		387	243
Capital gains/losses		(1,014)	(2,739)
Change in working capital	44.1	462	1,476
Net cash flow from operations		***14,815***	***13,643***
Net financial expenses disbursed		(1,062)	(1,209)
Income taxes paid		(389)	(771)
Net cash flow from operating activities		**13,364**	**11,663**
Investing activities:			
Acquisitions of equity investments, net of cash acquired		(484)	(2,463)
Disposals of equity investments, net of cash transferred [1]		1,261	2,472
Investments in intangible assets and property, plant and equipment	44.2	(16,186)	(14,747)
Net proceeds from sale of intangible assets and property, plant and equipment		611	1,140
Changes in financial assets		(2,367)	1,885
Net cash flow used in investing activities		**(17,165)**	**(11,713)**
Financing activities:			
EDF capital increase		-	4,005
Transactions with non-controlling interests [2]		1,548	481
Dividends paid by parent company	27.3	(511)	(109)
Dividends paid to non-controlling interests		(183)	(183)
Purchases/sales of treasury shares		(3)	(6)
Cash flows with shareholders		***851***	***4,188***
Issuance of borrowings		5,711	2,901
Repayment of borrowings		(2,844)	(6,304)
Issuance of perpetual subordinated bonds	3.5	1,243	-
Redemptions of perpetual subordinated bonds	3.6	(1,329)	-
Payments to bearers of perpetual subordinated bonds	27.4	(584)	(565)
Funding contributions received for assets operated under concessions		131	144
Investment subsidies		351	348
Other cash flows from financing activities		***2,679***	***(3,476)***
Net cash flow from financing activities		**3,530**	**712**
Net increase/(decrease) in cash and cash equivalents		**(271)**	**662**
CASH AND CASH EQUIVALENTS – OPENING BALANCE		3,692	2,893
Net increase/(decrease) in cash and cash equivalents		(271)	662
Effect of currency fluctuations		(95)	(13)
Financial income on cash and cash equivalents		13	21
Effect of reclassifications		(49)	129
CASH AND CASH EQUIVALENTS – CLOSING BALANCE	37	3,290	3,692

(1) In 2018, this item includes an amount of €966 million relating to the sale of Dunkerque LNG (see note 3.3).
In 2017, this item includes an amount of €1,282 million relating to the partial sale of the CTE (see note 3.11.3).

(2) Contributions via capital increases or capital reductions and acquisitions of additional interests or disposals of interests in controlled companies. In 2018, this item includes an amount of €797 million relating to the sale of 49% of EDF Renewables' wind farms (see note 3.8.2), and an amount of €743 million relating to CGN's payment for the NNB Holding Ltd. and Sizewell C Holding Co capital increases (€501 million at 31 December 2017).

Change in consolidated equity

Details of the change in equity between 1 January and 31 December 2018 are as follows:

(in millions of euros)	Capital	Treasury shares	Translation adjustments [1]	Fair value adjustment of financial instruments (OCI with recycling) [2]	Other consolidated reserves and net income [3]	**Equity (EDF share)**	Equity (non-controlling interests)	**Total equity**
Equity as published at 31/12/2016	**1,055**	**(29)**	**1,637**	**(1,587)**	**33,362**	**34,438**	**6,924**	**41,362**
Gains and losses recorded in equity	-	-	(1,501)	1,281	740	520	(119)	401
Net income	-	-	-	-	3,173	3,173	116	3,289
Consolidated comprehensive income			**(1,501)**	**1,281**	**3,913**	**3,693**	**(3)**	**3,690**
Payments on perpetual subordinated bonds	-	-	-	-	(565)	(565)	-	(565)
Dividends paid	-	-	-	-	(1,532)	(1,532)	(183)	(1,715)
Purchases/sales of treasury shares	-	(11)	-	-	-	(11)	-	(11)
Capital increase by EDF [4]	409	-	-	-	5,018	5,427	-	5,427
Other changes [5]	-	-	-	-	(93)	(93)	603	510
Equity as published at 31/12/2017	**1,464**	**(40)**	**136**	**(306)**	**40,103**	**41,357**	**7,341**	**48,698**
IFRS 9 restatements (see note 2.2.2.5)	-	-	-	(1,414)	1,414	-	-	-
Equity restated at 01/01/2018	**1,464**	**(40)**	**136**	**(1,720)**	**41,517**	**41,357**	**7,341**	**48,698**
Gains and losses recorded in equity	-	-	79	(136)	2,864	**2,807**	(88)	2,719
Net income	-	-	-	-	1,177	**1,177**	14	1,191
Consolidated comprehensive income			**79**	**(136)**	**4,041**	**3,984**	**(74)**	**3,910**
Payments on perpetual subordinated bonds	-	-	-	-	(584)	**(584)**	-	(584)
Issuance/Redemption of perpetual subordinated bonds (see notes 3.5 and 3.6)	-	-	-	-	(86)	**(86)**	-	(86)
Dividends paid	-	-	-	-	(1,360)	**(1,360)**	(183)	(1,543)
Purchases/sales of treasury shares	-	(16)	-	-	-	**(16)**	-	(16)
Capital increase by EDF [6]	41	-	-	-	806	**847**	-	847
Other changes [7]	-	-	-	-	327	**327**	1,093	1,420
EQUITY AT 31/12/2018	**1,505**	**(56)**	**215**	**(1,856)**	**44,661**	**44,469**	**8,177**	**52,646**

(1) Changes in translation adjustments amount to €79 million at 31 December 2018, mainly relating to the rise of the dollar against the euro, partly offset by the decline of the pound sterling against the euro.

(2) Changes in reserves recorded in OCI (Other Comprehensive Income) with recycling are shown in the Statement of Comprehensive Income. They correspond to the effects of fair value adjustments of debt securities and financial instruments hedging cash flows and net foreign investments, and amounts recycled to profit and loss in respect of terminated contracts and debt instruments transferred.

(3) Fair value changes recorded in OCI with no recycling are presented in the "Other consolidated reserves and net income" column.

(4) In 2017, the changes in capital and other consolidated reserves (issue premium) relate to EDF's capital increase amounting to €4,005 million net of expenses and payment of the balance of the scrip dividend for 2016 totalling €1,024 million and the scrip interim dividend for 2017 totalling €398 million.

(5) In 2017, "Other changes" in equity (non-controlling interests) include the effect of capital increases funded by CGN for NNB Holding Ltd. and Sizewell C Holding Co. amounting to €501 million.
They also include the effects of the acquisition of Framatome, amounting to €209 million (see note 3.11.2), with minority shareholders owning 24.5% of the capital.

(6) In 2018, the changes in capital and other consolidated reserves (issue premium) relate to payment of the balance of the scrip dividend for 2017 totalling €847 million (see note 27.3).

(7) In 2018, the changes in consolidated reserves and equity (non-controlling interests) include in particular the effect of the sale of 49% of EDF Renewables' wind farms (see note 3.8.2). "Other changes" in equity (non-controlling interests) also include the capital increases funded by CGN for NNB Holding Ltd. and Sizewell C Holding Co amounting to €743 million, and the effects of the sale of Dunkerque LNG amounting to €(433) million.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

Electricité de France (EDF or the "Company") is a French *société anonyme* governed by French law, and registered in France.

The consolidated financial statements reflect the accounting position of the Company and its subsidiaries (which together form the "Group") and the Group's interests in associates, joint arrangements classified as joint operations, and joint ventures, for the year ended 31 December 2018.

The Group is an integrated energy operator engaged in all aspects of the energy business: generation, transmission, distribution, supply, energy trading and services. As of 31 December 2017, it includes the activities of Framatome: services and production of equipment and fuel for reactors (see note 3.11.2).

The Group's consolidated financial statements at 31 December 2018 were prepared under the responsibility of the Board of Directors and approved by the Directors at the Board meeting held on 14 February 2019. They will become final after approval at the General Shareholders' Meeting to be held on 16 May 2019.

NOTE 1 GROUP ACCOUNTING POLICIES

1.1 DECLARATION OF CONFORMITY AND GROUP ACCOUNTING POLICIES

Pursuant to European regulation 1606/2002 of 19 July 2002 on the adoption of international accounting standards, the EDF group's consolidated financial statements at 31 December 2018 are prepared under the presentation, recognition and measurement rules set out in the international accounting standards published by the IASB and approved by the European Union for application at 31 December 2018. These international standards are IAS (International Accounting Standards), IFRS (International Financial Reporting Standards), and SIC and IFRIC interpretations.

The Group has not opted for early application of standards and interpretations that were not yet mandatory in 2018.

1.2 CHANGES IN ACCOUNTING STANDARDS AT 31 DECEMBER 2018

The accounting and valuation methods applied by the Group in the consolidated financial statements at 31 December 2018 are identical to those used in the consolidated financial statements at 31 December 2017, with the exception of the following changes:

1.2.1 IFRS 15 "Revenue from contracts with customers" and IFRS 9 "Financial instruments"

These two new standards adopted by the European Union are applicable for financial years beginning on or after 1 January 2018. The information required by IAS 8 concerning the effects of their application by the Group is given in note 2.

1.2.2 IFRIC 22 "Foreign Currency Transactions and Advance Consideration"

IFRIC 22, applicable for financial years beginning on or after 1 January 2018, was adopted by the European Union on 28 March 2018. This interpretation requires payment or receipt of a non-monetary advance in a foreign currency to be translated at the exchange rate of the transaction date, with no subsequent adjustment. Prospective application of IFRIC 22 does not have a significant impact on the EDF group's consolidated financial statements.

1.2.3 Other amendments and improvements to standards applicable from 1 January 2018

The following IASB publications have no impact on the Group's consolidated financial statements:

- Amendments to IAS 40 "Investment property" entitled "Transfers of investment property", adopted on 14 March 2018;
- Amendments to IFRS 2 "Share-based Payment" entitled "Classification and measurement of share-based payment transactions", adopted on 26 February 2018;
- Amendments to IFRS 4"Insurance Contracts" entitled "Applying IFRS 9 'Financial Instruments' with IFRS 4 'Insurance Contracts'", adopted on 3 November 2017;
- Annual improvements to IFRS, 2014-2016 cycle, adopted on 7 February 2018.

1.2.4 Standards and amendments adopted by the European Union but only applicable after 31 December 2018

1.2.4.1 IFRS 16 – Leases

IFRS 16 "Leases" was adopted by the European Union on 31 October 2017 and will be mandatory for financial years beginning on or after 1 January 2019.

IFRS 16 requires all leases other than short-term leases and leases of low-value assets to be recognised in the lessee's balance sheet in the form of a "right-of-use" asset, with a corresponding financial liability. Existing contracts classified as "operating leases" are currently reported as off-balance sheet items (see note 46.1.1.3).

The EDF group's lease contracts essentially concern real estate assets (office and residential properties), industrial installations (land, wind farms) and to a lesser extent vehicles and IT equipment.

The Group identified the potential impacts of the application of IFRS 16 via questionnaires sent to all its subsidiaries to collect information about the features of operating leases in existence at 31 December 2017. Based on the results, it was decided to apply the "modified" retrospective approach.

In compliance with the standard, the incremental borrowing rate is used to discount the lease liability to present value at the transition date. This rate is EDF's incremental indebtedness rate, based on zero-coupon EDF bond rates, adjusted for the currency risk, a country risk premium, the term of the contracts and the subsidiary's credit risk.

The Group also decided to apply the two exemptions allowed by IFRS 16, and therefore does not recognise:

- Leases with a duration of 12 months or less (and for the transition, leases terminating within 12 months of the first application of the standard);
- Leases of assets with individual value when new of less than USD5,000.

Based on the work done at 30 June 2018, application of IFRS 16 in the Group's financial statements at 31 December 2017 under the modified retrospective approach would have resulted in an increase of €4.3 billion in net indebtedness (including Framatome) and would have had a positive impact of approximately €0.5 billion on the operating income before depreciation and amortisation (excluding Framatome and including a partial cancellation of realised gains on sale amounting to €0.2 billion), and the consolidated net income would not have been significantly different.

At 31 December 2018, the impacts of IFRS 16 were reviewed. Under the modified retrospective approach, application of the standard results in an increase of approximately €4.5 billion in net indebtedness at 31 December 2018; also, according to the Group's calculations, application of IFRS 16 under the modified retrospective approach would have had a positive impact of approximately €0.5 billion on the operating income before depreciation and amortisation for 2018 (including a partial cancellation of realised gains on sale amounting to €0.2 billion), and the consolidated net income would not have been significantly different. The above effects on operating income before depreciation and amortisation and on the consolidated net income are reported for information purposes in compliance with IAS 8.30, due to use of the modified retrospective approach.

The difference between the lease liability estimated at 31 December 2017 and 31 December 2018 results from new lease contracts, revisions and updates of existing lease contracts, partly offset by repayments of the lease liability and deconsolidation of one entity.

The differences at 31 December 2018 between operating lease commitments presented in accordance with IAS 17 and the lease liability under IFRS 16 are explained as follows:

(in billions of euros)	31/12/2018
Operating lease commitments as lessee at 31/12/2018 (note 46.1.1.3)	4.4
Unrecognised contracts (IFRS 16 exemptions)	(0.1)
Differences in the durations applied for termination and extension options that are reasonably certain to be exercised	1.1
Leases signed in 2018 for an asset available after 1 January 2019	(0.3)
Other	(0.1)
Estimated non-discounted lease liability under IFRS 16 at 31/12/2018	5.0
Discount effect	(0.5)
Estimated discounted lease liability under IFRS 16 at 31/12/2018	4.5

1.2.4.2 Amendments to IFRS 9

The amendments to IFRS 9 entitled "Prepayment Features with Negative Compensation", adopted on 22 March 2018 by the European Union, will be applicable from 1 January 2019. Based on the operations completed to date, no impact is anticipated for the Group.

1.2.4.3 IFRIC 23 "Uncertainty over income tax treatments"

IFRIC 23 "Uncertainty over income tax treatments", adopted by the European Union on 23 October 2018, will be applicable from 1 January 2019.

This interpretation clarifies application of the provisions of IAS 12 "Income taxes" regarding recognition and measurement of income tax when fiscal uncertainty exists. Based on the Group's analyses in 2018, implementation of IFRIC 23 should not have any material impacts for the Group.

1.2.4.4 Amendments to IAS 28 "Long term Interests in Associates and Joint Ventures"

The amendments to IAS 28, adopted by the European Union on 8 February 2019, clarify that an entity should first apply IFRS 9 "Financial Instruments" to other interests in an associate or joint venture that form part of its net investment in that associate and joint venture but are not accounted for by the equity method. This standard is not expected to generate any significant impacts for the Group.

1.2.5 Standards and interpretations published by the IASB but not yet adopted by the European Union

The following IASB publications have not yet been adopted by the European Union but are expected to be applicable for financial years beginning on 1 January 2019, 1 January 2020 or 1 January 2021. Analyses are in process to estimate their potential impact on the Group's financial statements.

- Amendments to IAS 19 entitled "Plan Amendment, Curtailment or Settlement". IAS 19 already required actuarial assumptions to be updated and the net liability (or asset) on defined-benefit plans to be revalued. These amendments clarify that a company must update its actuarial assumptions during the accounting period to estimate the current service cost and the net interest expense on defined benefits from the date of the change affecting the plan.
- Annual improvements to IFRS, 2015-2017 cycle, containing amendments to:
  - IFRS 3 and IFRS 11: when one partner in a joint operation acquires additional interests that lead it to obtain exclusive control, its previous interest in the assets and liabilities of the joint operation must be restated at fair value through profit and loss.
  - IAS 12: the tax impacts of dividend distributions must be recognised in profit and loss, in other components of comprehensive income or in equity, consistent with the treatment of the operations that generated them.

- IAS 23: when a company has a specific borrowing for an asset under construction, the interest on that borrowing is allocated to the asset concerned until it is practically ready for its intended use, at which time the interest is included in the interest on all non-specific borrowings.

- Amendments to IFRS 3 entitled "Definition of a business", which clarify the distinction between the purchase of a business and the purchase of a group of assets.
- Amendments to the conceptual framework, published on 29 March 2018.
- Amendments to IAS 1 and IAS 8, entitled "Definition of material".
- IFRS 17 "Insurance Contracts".

1.3 SUMMARY OF THE PRINCIPAL ACCOUNTING AND VALUATION METHODS

The following accounting methods have been applied consistently through all the periods presented in the consolidated financial statements.

1.3.1 Valuation

The consolidated financial statements are prepared on a historical cost basis, with the exception of assets acquired and liabilities assumed through business combinations, and of certain financial instruments, which are stated at fair value.

1.3.2 Management judgements and estimates

The preparation of the financial statements requires the use of judgments, best estimates and assumptions in determining the value of assets and liabilities, income and expenses recorded for the period, considering positive and negative contingencies existing at year-end. The figures in the Group's future financial statements could differ significantly from current estimates due to changes in these assumptions or economic conditions.

In a context characterised by financial market volatility, the parameters used to prepare estimates are based on macro-economic assumptions appropriate to the very long-term cycle of Group assets.

The principal operations for which the Group uses estimates and judgments are the following:

1.3.2.1 Depreciation period of nuclear power plants in France

In the specific case of the depreciation period of its French nuclear power plants, the EDF group's industrial strategy is to continue operation beyond 40 years, in optimum conditions as regards safety and efficiency.

The depreciation period of 900MW series power plants was extended from 40 years to 50 years in 2016 (except for Fessenheim) since all the technical, economic and governance conditions were fulfilled. The depreciation period of other Group series in France (1300MW and 1450MW), which are more recent, is currently unchanged at 40 years, as the conditions for extension are not yet fulfilled.

These depreciation periods take into account the date of recoupling with the network after the most recent 10-year inspection.

As explained in note 4.1, under the proposed new multi-year energy programme (PPE), two nuclear reactors would, subject to certain conditions, be shut down in 2027 and 2028, ahead of their fifth 10-year inspection. If this is confirmed in the final PPE adopted, it could lead to prospective modification of the depreciation period for the two units concerned. As this situation would bring forward the shutdown of two reactors in the Group's fleet by a few years, the potential effect on the annual depreciation expense, which will depend on the reactors selected for shutdown, is expected to be limited.

The proposed PPE also stipulates that the closure of the two reactors at Fessenheim should take place "by spring 2020, in application of the cap on installed electronuclear power, so that the Flamanville EPR can be put into operation". The depreciation period for Fessenheim, which is currently due to end in November 2019, will be modified prospectively in accordance with the provisions of the final PPE.

1.3.2.2 Nuclear provisions

The measurement of provisions for the back-end of the nuclear cycle, decommissioning and last cores is sensitive to assumptions concerning technical processes, costs, inflation rates, long-term discount rates, the depreciation period of plants currently in operation and disbursement schedules.

As explained in note 4.1, under the proposed new PPE, two nuclear reactors would, subject to certain conditions, be shut down in 2027 and 2028, ahead of their fifth 10-year inspection. If this is confirmed in the final PPE adopted, it could lead to a change in the amount of corresponding nuclear provisions. As this situation would bring forward the shutdown of two reactors in the Group's fleet by a few years, the potential impact on nuclear provisions could be an increase of some tens of millions of euros, with an adjustment to the relevant balance sheet assets.

These parameters are therefore re-estimated at each closing date to ensure that the amounts accrued correspond to the best estimate of the costs eventually to be borne by the Group.

The Group considers that the assumptions used at 31 December 2018 are appropriate and justified. However, any future change in assumptions could have a significant impact on the Group's balance sheet and income statement.

The main assumptions and sensitivity analyses relating to nuclear provisions are presented in note 29.1.5.

The calculation of provisions incorporates a level of risks and unknowns as appropriate to the operations concerned. The valuation of costs carries uncertainty factors such as:

- changes in the regulations, particularly on safety, security and environmental protection, and financing of nuclear expenses;
- changes in the regulatory decommissioning process and the time necessary for issuance of administrative authorisation;
- future methods for storing long-lived radioactive waste and provision of storage facilities by the French agency for radioactive waste management ANDRA (*Agence nationale pour la gestion des déchets radioactifs*);
- changes in certain financial parameters such as discount rates, notably in relation to the regulatory limit, inflation rates, or changes in the contractual terms of spent fuel management.

1.3.2.3 Pensions and other long-term and post-employment benefit obligations

The value of pensions and other long-term and post-employment benefit obligations is based on actuarial valuations that are sensitive to all the actuarial assumptions used, particularly concerning discount rates, inflation rates and wage increase rates.

The principal actuarial assumptions used to calculate these post-employment and long-term benefits at 31 December 2018 are presented in note 31. These assumptions are updated annually. The Group considers the actuarial assumptions used at 31 December 2018 appropriate and well-founded, but future changes in these assumptions could have a significant effect on the amount of the obligations and the Group's equity and net income. Sensitivity analyses are therefore presented in note 31.

1.3.2.4 Impairment of goodwill and long-term assets

Impairment tests on goodwill and long-term assets are sensitive to the macro-economic and segment assumptions used – particularly concerning energy price movements – and medium-term financial forecasts. The Group therefore revises the underlying estimates and assumptions based on regularly updated information.

These assumptions, which are specific to Group companies, are presented in note 13.

1.3.2.5 Financial instruments

In measuring the fair value of unlisted financial instruments (essentially energy contracts), the Group uses valuation models based on a certain number of assumptions subject to unforeseeable developments.

1.3.2.6 Energy supplied but not yet measured and billed

As explained in note 1.3.7, the quantities of energy supplied but not yet measured and billed are calculated at the reporting date based on consumption statistic models and selling price estimates. Determination of the unbilled portion of sales revenues at the year-end is sensitive to the assumptions used to prepare these statistics and estimates.

1.3.2.7 Obligations concerning French public distribution concession assets to be replaced

In view of the specific nature of French public electricity distribution concessions, the Group has opted to present its obligation to replace concession assets in the balance sheet at a value based on the amount of contractual commitments as calculated and disclosed to the grantors in the annual business reports (see note 1.3.13.2.1). An alternative approach would be to value the obligations based on the present value of future payments necessary to replace these assets at the end of their industrial useful life. The impacts this alternative approach would have had on the accounts are shown in note 1.3.23 for information. Whatever valuation method is used, measurement of the concession liability concerning assets to be replaced is notably subject to unforeseeable developments in terms of costs, useful life and disbursement dates.

1.3.2.8 Deferred tax assets

The use of estimates and assumptions over recovery horizons is particularly important in the recognition of deferred tax assets.

1.3.2.9 Other judgements

- For the application of IFRS 10 and IFRS 11, the Group uses judgment to assess control or classify the type of partnership arrangement represented by a jointly-controlled entity.

  In particular, EDF has set up "reserved" investment funds for some of its funds set aside for secure financing of nuclear plant decommissioning expenses and long-term storage expenses for radioactive waste (see note 45.3). In view of the funds' characteristics, the prerogatives exercised by their managers and the procedures for defining the management strategies applicable to them, the Group considers that it does not have control, as defined by IFRS 10, over these funds. They are consequently treated as debt or equity securities, in application of IFRS 9.

  Furthermore, through its subsidiary Edison, since 2014 the Group has held a 30% investment in Edens, with F2i. However, the governance arrangements and contractual agreements introduced for Edens in connection with this transaction give Edison exclusive control over the company. In application of IFRS 10, Edens is therefore fully consolidated (*via* Edison) in the Group's consolidated financial statements.
- When there is no standard or interpretation applicable to a specific transaction, the Group exercises judgment to define and apply accounting methods that supply relevant and reliable information for preparation of its financial statements.

1.3.3 Consolidation methods

A list of the main subsidiaries, associates and joint ventures is presented in note 51.

1.3.3.1 Controlled entities

Subsidiaries are companies in which the Group exercises exclusive control and are fully consolidated. The Group controls an entity when the three following conditions are fulfilled:

- it holds power over the entity;
- it is exposed, or has rights, to variable returns from its involvement with the entity;
- it has the ability to use its power to affect the amount of the investor's returns.

The Group considers all facts and circumstances when assessing control. All substantive potential voting rights exercisable, including by another party, are also taken into consideration.

1.3.3.2 Investments in associates and joint ventures

An associate is an entity in which the Group exercises significant influence on financial and operational policies without having exclusive or joint control. Significant influence is presumed to exist when the Group's investment is at least 20%.

A joint venture is a partnership in which the parties (joint venturers) that exercise joint control over the entity have rights to the entity's net assets. Joint control is the contractually agreed sharing of control of an entity operated jointly by a limited number of partners or shareholders, such that the financial and operational policies result from unanimous consent of the parties.

Investments in associates and joint ventures are accounted for by the equity method. They are carried in the balance sheet at historical cost, adjusted for the share in net assets generated after the acquisition, less any impairment. The share in the net income for the period is reported in "Share in net income of associates and joint ventures" in the income statement.

1.3.3.3 Investments in joint operations

A joint operation is a joint arrangement in which the parties (joint operators) that exercise joint control over the entity have direct rights to its assets, and obligations for its liabilities. The Group, as an operator in a joint operation, reports the assets and liabilities and income and expenses related to its investment line by line.

1.3.4 Financial statement presentation rules

Assets and liabilities contributing to working capital used in the entity's normal operating cycle are classified as current in the consolidated balance sheet. Other assets and liabilities are classified as current if they mature within one year of the closing date, and non-current if they mature more than one year after the closing date.

The income statement presents items by nature. The heading "Other income and expenses" presented below the operating profit before depreciation and amortisation comprises items of an unusual nature or amount.

1.3.5 Translation methods

1.3.5.1 Reporting currency

The parent company's functional currency is the Euro. The Group's financial statements are presented in millions of euros.

1.3.5.2 Functional currency

An entity's functional currency is the currency of the economic environment in which it primarily operates. In most cases, the local currency is the functional currency. But for some entities, a functional currency other than the local currency may be used when it reflects the currency used in the principal transactions.

1.3.5.3 Translation of the financial statements of foreign companies whose functional currency is not the Euro

The financial statements of foreign companies whose functional currency is not the Euro are translated as follows:

- balance sheets are translated into Euros at the closing rate;
- income statements and cash flows are translated at the average rate for the period;
- resulting differences are recognised in equity under the heading "Translation adjustments".

Translation adjustments affecting a monetary item that is an integral part of the Group's net investment in a consolidated foreign company are included in consolidated equity until the disposal or liquidation of the net investment, at which date they are recognised as income or expenses in the income statement, in the same way as other exchange differences concerning the company.

1.3.5.4 Translation of transactions in foreign currencies

In application of IAS 21, transactions expressed in foreign currencies are initially translated and recorded in the functional currency of the entity concerned, using the rate in force at the transaction date.

At each reporting date, monetary assets and liabilities expressed in foreign currencies are translated at the closing rate. The resulting foreign exchange differences are taken to the income statement.

In application of IFRIC 22, any payment or receipt of a non-monetary advance in a foreign currency must be translated at the exchange rate of the transaction date, with no subsequent adjustment.

1.3.6 Related parties

Related parties include the French State, companies in which the State holds majority ownership and certain of their subsidiaries, and companies in which the EDF group exercises joint control or significant influence. They also include members of the Group's management and governance bodies.

1.3.7 Sales

Sales essentially comprise income from energy sales (to final customers and as part of trading activities), delivery services related to use of the transmission and distribution network, and connection services. They also comprise income from other services and deliveries of goods, mainly engineering, operating and maintenance services, services related to energy sales, design, delivery and commissioning services for power plants or their major components.

Income on energy sales is recognised as deliveries are made to customers.

The quantities of energy supplied but not yet measured and billed are calculated using consumption statistics and selling price estimates, and are recognised in sales on that basis.

In accordance with the provisions of IFRS 15 on the principal/agent distinction, energy delivery services are recognised in sales in the following cases:

- Either when these services are not distinct from the energy supply service;
- Or when they are distinct from the energy supply service and the entity concerned is acting as a principal, notably because it bears the risk of execution of the service or is able to set the tariff for delivery to the final customer.

Energy trading operations and optimisation transactions carried out by certain group entities under its risk management policy are recognised net of purchases.

The sales revenue from other services or deliveries of goods is recognised over time in the three following cases, based on a contractual analysis:

- When the customer simultaneously receives and consumes all the benefits generated as the service is performed by the Group (this is notably the case of operations and maintenance services);
- When the good or service to be supplied cannot be reallocated to another customer, and the Group is entitled to payment for the work done so far (this is notably the case of certain design, delivery and commissioning activities for power plants or major components designed specifically for a customer);
- When the service creates or enhances an asset (good or service) for which the customer acquires control as performance of the service progresses.

1.3.7.1 Capacity mechanism

Capacity mechanisms have been set up in France and the UK to ensure secure power supplies during peak periods.

- French system: French law 2010-1488 of 7 December 2010 on the new organisation of the electricity market introduced an obligation in France to contribute to power supply security from January 2017.

  Operators of electricity generation facilities and load-shedding operators must have their capacities certified by RTE, and commit to a forecast level of availability for a given year of delivery. In return, they are awarded capacity certificates. Meanwhile, electricity suppliers and purchasers of power to

compensate for networks losses (obligated actors) must have capacity certificates equivalent to consumption by their customers in peak periods. Suppliers pass on the cost of the capacity mechanism to final customers through their sale prices.

The system is completed by registers for capacity trading between actors. Capacity auctions are held several times a year.

The Group is concerned by both aspects of this system, both as an operator of electricity plants (EDF SA, Dalkia, EDF Renewables (formerly EDF Energies Nouvelles)) and as an electricity supplier (EDF SA, Électricité de Strasbourg) and a purchaser of power to compensate for networks losses (Enedis and Électricité de Strasbourg).

The operations are recorded as follows:

- Sales of certificates are recognised in income when the auctions or over-the-counter sales take place;
- The cost of the capacity mechanism passed on to final customers through regulated sales tariffs and market-price offers is recognised in sales revenues as and when the electricity is delivered. However, the ARENH price has included a capacity value since 1 January 2017 when the capacity mechanism took effect, as the terms of transfer for the capacity guarantees associated with the ARENH system were defined by the CRE;
- Stocks of certificates are stated either at their certification value (*i.e.* cost of certification by RTE) or at their purchase value on the markets;
- Decreases in the stock of certificates are valued at the weighted average unit cost. The timing of recognition depends on the actor:
    - Operators of installations: when the auction sales take place;
    - Obligated actors: spread on a straight-line basis over the 5-month peak period.
- For obligated actors, if there is a shortfall in the stocks of capacity certificates, a provision is recorded equivalent to the best estimate of the expense necessary to extinguish the obligation;
- At the closing date, if the realisable value of the stock of capacity certificates is lower than its net book value, impairment is recognised.

- British system: The British capacity mechanism is based on a system of auctions for operators, organised by the network operator 4 years prior to delivery. Capacity operators which have acquired certificates are remunerated in the year of delivery out of a fund consisting of contributions from electricity suppliers.

  The electricity suppliers' contribution to this mechanism is proportional to their sales to customers in the peak period and the cost of capacity is passed on to final customers through their sale price.

  EDF Energy is concerned by both aspects of this system, as an operator of electricity plants and a supplier.

  For accounting purposes, the remuneration received in its capacity as an operator is recognised in sales revenues in the year of delivery and the contribution paid to the mechanism in its capacity as an electricity supplier is recognised in expenses over the peak period. The cost of the capacity mechanism passed on to final customers is recognised in sales revenues as and when the electricity is delivered.

  On 15 November 2018, the UK's Capacity Market was suspended after a ruling by the European Court of Justice concluding that it did not comply with EU rules on state aid. The British government is aiming to set up a new mechanism in time for further auctions in summer 2019 for the delivery period 2019/2020. No capacity market revenues have been recognised for the suspension period of 2018.

1.3.8 Income taxes

Income taxes include the current tax expense (income) and the deferred tax expense (income), calculated under the tax legislation in force in the countries where earnings are taxable.

In compliance with IAS 12, current and deferred taxes are generally recorded in the income statement or in equity symmetrically to the underlying operation.

Under IAS 32, income taxes on distributions to holders of equity instruments (notably dividends and the remuneration paid to holders of perpetual subordinated bonds) must be recognised in accordance with IAS 12. The Group considers that these distributions are paid out of previous years' accumulated profits and as a result the associated tax effects are included in the net income for the period.

The current tax expense (income) is the estimated amount of tax due on the taxable income for the period, calculated using the tax rates adopted at the year-end.

Deferred taxes result from temporary differences between the book value of assets and liabilities and their tax basis. No deferred taxes are recognised for temporary differences generated by:

- goodwill which is not tax deductible;
- the initial recognition of an asset or liability in a transaction which is not a business combination and does not affect the accounting profit or taxable profit (tax loss) at the transaction date;
- investments in subsidiaries and associates, investments in branches and interests in joint arrangements, when the Group controls the timing of reversal of the temporary differences, and it is probable that the temporary differences will not reverse in the foreseeable future.

Deferred tax assets and liabilities are valued at the expected tax rate for the period in which the asset will be realised or the liability extinguished, based on tax rates adopted at the year-end. If the tax rate changes, deferred taxes are adjusted to the new rate and the adjustment is recorded in the income statement, unless it relates to an underlying for which changes in value are recorded in equity, for example in accounting for actuarial gains and losses or fair value on hedging instruments and debt or equity securities.

Deferred taxes are reviewed at each closing date, to take into account changes in tax legislation and the prospects for recovery of deductible temporary differences. Deferred tax assets are only recognised when it is probable that the Group will have sufficient taxable profit to utilise the benefit of the asset in the foreseeable future, or beyond that horizon, if there are deferred tax liabilities with the same maturity.

Deferred tax assets and liabilities are reported on a net basis, determined at the level of a tax entity or tax group.

1.3.9 Earnings per share and diluted earnings per share

Earnings per share is calculated by dividing the Group's share of net income by the weighted average number of shares outstanding over the period. This weighted average number of shares outstanding is the number of ordinary shares at the beginning of the year, adjusted by the number of shares redeemed or issued during the year.

This number, and the earnings per share, are adjusted whenever necessary to reflect the impact of translation or exercise of dilutive potential shares (stock options, stock warrants and convertible bonds issued, etc.).

In compliance with IAS 33, earnings per share and diluted earnings per share are based on the net income for the year after deduction of payments to bearers of perpetual subordinated bonds.

1.3.10 Business combinations

In application of IFRS 3 business combinations arising since 1 January 2010 are measured and recognised under the following principles.

At the date of acquisition, the identifiable assets acquired and liabilities assumed, measured at fair value, and any non-controlling interests in the company acquired (minority interests) are recorded separately from goodwill.

Non-controlling interests may be valued either at fair value (full goodwill method) or their share in the fair value of the net assets of the acquired company (partial goodwill method). The decision is made individually for each transaction.

Any acquisition or disposal of an investment in a subsidiary that does not affect control is considered as a transaction between shareholders and must be recorded directly in equity.

If additional interests are acquired in a joint venture, joint operation or associate without resulting in acquisition of control, the value of the previously-acquired assets and liabilities remains unchanged in the consolidated financial statements.

If control is acquired in stages, the cost of the business combination includes the fair value, at the date control is acquired, of the purchaser's previously-held interest in the acquired company.

Related costs directly attributable to an acquisition leading to control are treated as expenses for the periods in which they were incurred, except for issuance costs for debt securities or equity instruments, which must be recorded in compliance with IAS 32 and IFRS 9.

IFRS 3 does not apply to common control business combinations, which are examined on a case-by-case basis to determine the appropriate accounting treatment.

Commitments given by the Group to purchase minority interests in Group-controlled companies are included in liabilities. For commitments of this kind given since 1 January 2010, the date of the Group's first application of IAS 27 (amended) and IFRS 3 (revised), the differential between the value of the non-controlling interests and the liability corresponding to the commitment is recorded in equity.

1.3.11 Goodwill and other intangible assets

1.3.11.1 Goodwill

1.3.11.1.1 Determination of goodwill

In application of IFRS 3, "Business combinations", goodwill is the difference between:

- the sum of the following items:
  - the acquisition-date fair value of the price paid to acquire control;
  - the value of non-controlling interests in the entity acquired; and
  - for acquisitions achieved in stages, the acquisition-date fair value of the Group's share in the acquired entity before it acquired control; and
- the net value of the assets acquired and liabilities assumed, measured at fair value at the acquisition date.

When this difference is negative it is immediately included in net income.

The fair values of assets and liabilities and the resulting goodwill are finalised within twelve months of the acquisition.

1.3.11.1.2 Measurement and presentation of goodwill

Goodwill on acquisition of subsidiaries is disclosed separately in the balance sheet. Impairment on this goodwill is reported under the heading "Impairment" in the income statement. After initial recognition, goodwill is carried at cost less any impairment recognised.

Goodwill on acquisition of associates and joint ventures is included in the investment's net book value. Impairment on this goodwill is included under the heading "Share in income of associates and joint ventures".

Goodwill is not amortised, but impairment tests are carried out as soon as there is an indication of possible loss of value, and at least annually, as described in note 1.3.15.

1.3.11.2 Other intangible assets

1.3.11.2.1 Research and development expenses

Research expenses are recognised as expenses in the financial period incurred.

Development costs that qualify for capitalisation under IAS 38 are included in intangible assets and amortised on a straight-line basis over their foreseeable useful life.

1.3.11.2.2 Other self-produced or purchased intangible assets

Other intangible assets mainly comprise:

- software, which is amortised on a straight-line basis over its useful life;
- purchased brands with an indefinite useful life, or amortised on a straight-line basis over their useful life;

- operating or usage rights for power plants, which are amortised on a straight-line basis over the useful life of the underlying asset;
- rights or licenses relating to hydrocarbon concessions, which are amortised under the Unit Of Production (UOP) method, and exploration expenses amortised over the year (see note 1.3.11.2.3);
- intangible assets related to environmental regulations (greenhouse gas emission rights and renewable energy certificates acquired for a consideration – see note 1.3.27);
- the positive value of energy purchase/sale contracts stated at fair value as part of a business combination governed by IFRS 3: this value is amortised as the contractual deliveries take place.
- assets related to concession contracts governed by IFRIC 12, under the "intangible model" (see note 1.3.13.2.4);
- technology related to activities as designer and supplier of nuclear steam supply systems and manufacturer of control rod clusters and nuclear fuel (Framatome) including codes and methods, EPR technology, patents and manufacturing processes, all amortised over their useful life;
- purchased customer contracts and relations, amortised over their useful life.

1.3.11.2.3 Hydrocarbon prospecting, exploration and generation

The Group applies IFRS 6, "Exploration for and Evaluation of Mineral Resources".

Prospection and exploration costs and costs incurred in connection with geological surveys, exploration tests, geological and geophysical mapping and exploratory drilling are recognised as intangible assets and fully amortised in the year they are incurred.

Development costs related to commercially viable mineral wells and investments in facilities to extract and store hydrocarbons are recognised as "Property, plant and equipment used in generation and other tangible assets owned by the Group" or "Property, plant and equipment operated under concessions for other activities" as appropriate.

They are amortised under the Unit Of Production (UOP) method.

1.3.12 Concession assets, generation assets and other property, plant and equipment

The Group's property, plant and equipment is reported under three balance sheet headings, as appropriate to the business and contractual circumstances of their use:

- property, plant and equipment operated under French public electricity distribution concessions;
- property, plant and equipment operated under concessions for other activities;
- property, plant and equipment used in generation and other tangible assets owned by the Group.

1.3.12.1 Initial measurement

Property, plant and equipment is recorded at acquisition or production cost.

- The cost of facilities developed in-house includes all labour and materials costs, and all other production costs that can be included in the construction of the asset.
- Borrowing costs attributable to the financing of an asset incurred during the construction period are included in the value of the asset provided it is a qualifying asset as defined by IAS 23 "Borrowing costs".
- The cost of property, plant and equipment also includes the initial estimate of decommissioning costs. These assets are associated with the provisions recorded to cover decommissioning obligations. At the date of commissioning, property, plant and equipment is measured and recorded in the same way as the corresponding provision (see note 1.3.21).
- Decommissioning costs for nuclear generation installations also include last core costs (see note 1.3.21).

When some of the decommissioning costs for a plant are to be borne by a partner, the expected reimbursement is recognised as accrued income in the assets. The difference between the provision and the accrued income is recorded in Property, plant and equipment, and subsequent payments by the partner are deducted from the accrued income.

The Group capitalises safety expenses incurred as a result of legal and regulatory obligations sanctioning non-compliance by an administrative ban from operation.

Strategic safety spare parts for generation facilities are treated as property, plant and equipment, and depreciated over the residual useful life of the installations.

The costs of major inspections that are necessary for continued operation by generation assets are capitalised and amortised over a period corresponding to the time elapsing between two inspections.

When a part of an asset has a different useful life from the overall asset's useful life, it is identified as an asset component and depreciated over a specific period.

1.3.12.2 Depreciation

Items of property, plant and equipment are depreciated on a straight-line basis over their useful life, defined as the period during which the Group expects to draw future economic benefits from their use.

Depending on each country's specific regulations and contractual arrangements, the expected useful lives for the main facilities are as follows:

- hydroelectric dams — 75 years
- electromechanical equipment used in hydropower plants — 50 years
- fossil-fired power plants — 25 to 45 years
- nuclear generation facilities:
  - in France — 40 to 50 years
  - outside France — 35 to 60 years
- transmission and distribution installations (lines, substations) — 20 to 50 years
- wind farm and photovoltaic facilities — 20 to 25 years
- other general plant and machinery — 10 to 20 years

1.3.13 Concession agreements

1.3.13.1 Accounting treatment

The accounting treatment of public and private agreements depends on the nature of the agreements and their specific contractual features.

For most of its concessions, other than concessions for heat generation and distribution, the Group considers that in substance the grantors do not have the characteristic features of control over infrastructures as defined in IFRIC 12.

1.3.13.2 French concessions

In France, the Group is the operator for four types of public service concessions:

- public electricity distribution concessions in which the grantors are local authorities (municipalities or syndicated municipalities);
- hydropower concessions with the State as grantor;
- the public transmission network operated under concession from the State;
- concessions from public grantors for heat generation and distribution.

1.3.13.2.1 Public electricity distribution concessions

General background

Since the enactment of the French Law of 8 April 1946, EDF, and then Enedis, has been the operator of most of the public distribution networks in France.

In accordance with France's Energy Code and Local Authorities Code, the public distribution of electricity is principally operated under a specific system of public service concessions. The authorities granting the concessions (local authorities or public establishments for cooperation between local authorities) organise the public electricity distribution service through concession agreements with specifications that define the respective rights and obligations of the grantor and the operator. Enedis thus distributes electricity to 95% of the population of mainland France. The other 5% are served by Local Distribution Companies.

The accounting treatment of concessions is based on the concession agreements, with particular reference to their special clauses. It takes into consideration the possibility that the EDF group may one day lose its status as the sole authorised State concession operator.

Concession agreement models

Enedis' concession agreements correspond to different models depending on the date of signature.

1992 concession agreement model (updated in 2007)

The 1992 concession specifications model (updated in 2007) was negotiated with the FNCCR (National federation of licensing authorities) and approved by the public authorities. This model places Enedis under an obligation to record industrial depreciation and establish provisions for renewal.

2017 concession agreement model

On 21 December 2017, a framework agreement for a new concession agreement model was signed with FNCCR and France Urbaine. This new model modernises the relationship between Enedis and concession grantors in the long term and reflects the parties' attachment to the principles of French concessions for electricity distribution: public service, regional solidarity and national optimisation. The FNCCR and France Urbaine represent the grantors, particularly towns, syndicated municipalities, boroughs and major cities when they are the authorities with competence to grant public electricity distribution concessions.

As of 2018, newly-signed concession agreements apply the concession agreement model validated on 21 December 2017. At the effective date of a new agreement, the existing special concession liabilities recorded in application of the previous concession agreement to represent the grantor's rights in the concession assets remain in the accounts. Like earlier concession agreements signed since 2011, the contractual obligation to establish provisions for renewal no longer applies, and the governance of investments is different.

To provide an effective public service, the distribution network operator and the concession grantor now agree to jointly set up a governance system to oversee investments in the public electricity distribution network over the area covered by the concession, including replacement of infrastructures. This system mainly takes the form of a master plan taking a long-term view of developments in the network over the concession area, and multi-year investment plans (PPIs) for 4 and 5-year periods that are medium-term applications of the master plan. PPIs contain detailed objectives for each investment purpose, concerning a selection of quantified, localised investments with financial valuations for the duration of the plan. If it is observed at the end of a PPI that some of the planned investments have not been made, the concession grantor would be entitled in certain circumstances to order Enedis to deposit a sum equal to 7% of the investments still to be made. This deposit would then be returned or retained after a two-year period, depending on the investments made by that time.

Recognition of assets as property, plant and equipment operated under French public electricity distribution concessions

All assets used by the EDF group in public electricity distribution concessions in France, whether they are owned by the grantor or the operator, are reported together on a specific line in the balance sheet assets at acquisition cost, or their estimated value at the transfer date when supplied by the grantor.

1.3.13.2.2 Hydropower concessions

Hydropower concessions follow standard rules approved by decree. Hydropower concession assets consist solely of hydropower generation equipment (dams, pipes, turbines, etc) for initial concessions. In other concessions, they comprise hydropower generation equipment and switching facilities (alternators, etc).

Assets used in these concessions, whether operated under the concession agreement or owned by the EDF group, are recorded under "Property, plant and equipment operated under concessions for other activities" at acquisition cost.

Hydropower concessions have an initial term of 75 years pursuant to the French Law of 16 October 1919 relating to hydropower use. Most hydropower concessions that expired before 2012 were renewed for terms of

30 to 50 years. However, the French government has not yet renewed 12 concessions that have expired. Since their expiry these concessions have thus been in the "rolling extension" situation defined by the law, which stipulates that at the expiry date of a concession, if no new concession has been established "the concession is extended on the existing terms until such time as a new concession is granted", so as to ensure continuity of operations in the meantime (Article L. 521-16 par. 3 of the French Energy Code).

1.3.13.2.3 Public transmission concession

Under French law, assets assigned to the public transmission concession belong to Réseau de Transport d'Électricité (RTE). These assets are included in calculating the equity value of CTE in the consolidated balance sheet.

1.3.13.2.4 Heat generation and distribution concessions

Heat generation and distribution concession agreements signed by Dalkia with public authorities confer the right to operate facilities remitted by or constructed at the request of those authorities for a limited period, under the grantor's supervision.

These agreements set the terms for remuneration and transfer of the facilities to the grantor or another operator succeeding the grantor at the end of the agreement.

The assets are recorded as intangible assets, in accordance with IFRIC 12 "Service concession agreements".

1.3.13.3 Foreign concessions

Foreign concessions are governed by a range of contracts and national laws. Most assets operated under foreign concessions are recorded under "Property, plant and equipment operated under concessions for other activities". Foreign concessions essentially concern Edison in Italy, which operates hydrocarbon generation sites, gas storage sites, local gas distribution networks and hydropower generating plants under concessions. Edison owns all the assets except for some items of property, plant and equipment on the hydropower generation sites, which will be returned to the grantor for nil consideration or with an indemnity when the concession ends. In compliance with IFRIC 12, certain concession agreements are recorded as intangible assets.

Hydropower generation assets which will be returned for nil consideration at the end of the concession are depreciated over the duration of the concession. Hydrocarbon generation sites are recorded in compliance with the rules applicable to the sector (see note 1.3.11.2.3).

1.3.14 Leases

In the course of its business the Group uses assets made available to it, or makes assets available to lessees, under lease contracts. These contracts are analysed in the light of the situations described and indicators provided in IAS 17 in order to determine whether they are finance leases or operating leases.

1.3.14.1 Finance leases

Contracts that effectively transfer substantially to the lessee all risks and benefits inherent to ownership of the leased item are classified as finance leases. The main criteria examined in determining whether substantially all the risks and benefits are transferred by an agreement are the following:

- the ratio of the duration of the lease to the leased asset's economic life;
- total discounted future payments as a ratio of the fair value of the financed asset;
- whether ownership is transferred at the end of the lease;
- whether the purchase option is attractive;
- the features specific to the leased asset.

Assets used under finance leases are derecognised from the lessor's balance sheet and included in the relevant category of property, plant and equipment in the lessee's accounts. Such assets are depreciated over their useful life, or the term of the lease contract when this is shorter.

A corresponding financial liability is booked by the lessee, and a financial asset by the lessor.

If the Group performs a sale and leaseback operation resulting in a finance lease agreement, this is recognised in accordance with the principles described above. If the transfer price is higher than the asset's book value, the surplus is deferred and recognised as income progressively over the term of the lease.

1.3.14.2 Operating leases

Lease agreements that do not qualify as finance leases are classified and recognised as operating leases. Rental charges are spread over the duration of the lease agreement on a straight-line basis.

1.3.14.3 Arrangements containing a lease

In compliance with IFRIC 4, the Group identifies arrangements that do not have the legal form of a lease contract but nonetheless convey the right to control the use of an asset or group of specific assets to the purchaser.

Such arrangements are treated as leases, and analysed with reference to IAS 17 for classification as either finance or operating leases.

1.3.15 Impairment of goodwill, intangible assets and property, plant and equipment

At the year-end and at each interim reporting date, in application of IAS 36, the Group assesses whether there is an indication that an asset could have been significantly impaired. An impairment test is also carried out at least once a year on cash-generating units (CGUs) or groups of CGUs including an intangible asset with an indefinite useful life, or to which goodwill has been partly or totally allocated.

Impairment tests are carried out as follows:

- the Group measures any long-term asset impairment by comparing the carrying value of these assets and goodwill, grouped into CGUs where necessary, and their recoverable amount;
- CGUs are groups of homogeneous assets that generate identifiable independent cash flows. They reflect the way activities are managed in the Group: they may be subgroups when the activity is optimised across the whole subgroup, or CGUs formed by parts of subgroups corresponding to different types of activity that are managed separately (fossil-fired generation, renewable energy production, services). Goodwill is allocated to the CGUs that benefit from synergies resulting from the acquisition;
- the recoverable value of these CGUs is the higher of fair value net of disposal costs, and value in use. When this recoverable value is lower than the carrying amount in the balance sheet, an amount equal to the difference is booked under the heading "Impairment". The loss is allocated first to goodwill, and any surplus to the other assets of the CGU concerned;
- fair value is the asset's potential sale price in a normal transaction between economic actors;
- value in use is calculated based on projected future cash flows:
  - over a horizon that is coherent with the asset's useful life and/or operating life,
    - for certain intangible assets with an indefinite useful life (such as brands), beyond the horizon that can be observed or modelled, a terminal value is determined by discounting to infinity a normative cash flow,
  - excluding development projects other than those that have been decided at the valuation date,
  - and discounted at a rate that reflects the risk profile of the asset or CGU;
- the discount rates used are based on the weighted average cost of capital (WACC) for each asset or group of assets concerned, determined by geographical area and by business segment under the CAPM. WACC is calculated after taxes;
- future cash flows are calculated on the basis of the best available information at the valuation date:
  - for the first few years, the flows correspond to the Medium-Term Plan (MTP). Over the MTP horizon, energy and commodity prices are determined based on available forward prices, taking hedges into consideration;
  - beyond the MTP horizon, cash flows are estimated based on long-term assumptions prepared for each country and each energy, using a process that is updated annually. Medium and long-term

electricity prices are constructed analytically by assembling blocks of assumptions, e.g. economic growth, commodity prices (oil, gas, coal) and CO_2, demand for electricity, interconnections, and developments in the energy mix (rise of renewable energies, installed nuclear capacity, etc) with fundamental models of supply-demand balance. The Group refers in particular to external analyses for each assumption object (for example, for commodities and CO_2, which are primary factors in electricity prices, the Group compares its own scenarios with scenarios developed by organisations such as the AIE, IHS or Wood Mackenzie, bearing in mind that each of these analysts itself proposes a cone of scenarios corresponding to different macro-economic environments);

- Income from capacity market mechanisms is also taken into consideration in valuing generation assets, starting from the MTP horizon where relevant, provided the countries concerned have introduced or announced the future introduction of a capacity remuneration mechanism.

These calculations may be influenced by several variables:

- changes in discount rates;
- changes in market prices for energy and commodities and tariff regulations;
- changes in demand and the Group's market share, and the attrition rate on customer portfolios;
- the useful life of facilities, or the duration of concession agreements where relevant;
- the growth rates used beyond the medium-term plans and where relevant the terminal values taken into consideration.

Impairment recognised on goodwill is irreversible.

1.3.16 Financial assets and liabilities

Classification and measurement of financial instruments depend on the business model and the instruments' contractual characteristics. In application of IFRS 9, upon initial recognition, financial assets are carried at amortised cost, fair value through other comprehensive income (OCI), or fair value through profit and loss.

In the Group, financial assets comprise equity instruments (particularly non-consolidated investments), debt securities, loans and receivables at amortised cost including trade receivables, and the positive fair values of derivatives.

Financial instruments allocated to dedicated assets are presented in note 45.

Financial liabilities comprise loans and other financial liabilities, trade payables, bank credit and the negative fair value of derivatives.

Financial assets and liabilities are recorded in the balance sheet as current if they mature within one year and non-current if they mature after one year, apart from derivatives held for trading, which are all classified as current.

1.3.16.1 Valuation and classification of financial assets and liabilities

Financial instruments are stated at fair value, which corresponds to the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction on the principal or most advantageous market at the measurement date.

The valuation methods for each level are generally as follows:

- level 1 (unadjusted quoted prices): prices accessible to the entity at the measurement date on active markets, for identical assets or liabilities;
- level 2 (observable data): data concerning the asset or liability, other than the market prices included in initial level 1 input, which are directly observable (such as a price) or indirectly observable (i.e. deducted from observable prices);
- level 3 (non-observable data): data that are not observable on a market, including observable data that have been significantly adjusted.

1.3.16.1.1 Financial assets carried at fair value through OCI

Financial assets carried at fair value through OCI comprise:

- Certain non-consolidated investments for which the Group has elected the irrevocable option to recognise subsequent fair value changes in OCI, with no recycling to profit and loss in the event of sale. Only dividends received from these investments are recognised in the income statement, under "Other financial income";
- Debt securities (such as bonds) invested under a mixed "collect and sell" business model for which contractual cash flows consist entirely of principal and interest payments reflecting the time value of money and the credit risk associated with the instrument (the IFRS 9 "SPPI" test – Solely Payment of Principal and Interest). Changes in fair value are recorded directly in OCI with recycling and transferred to profit and loss when the securities are sold. For these debt securities, interest income is calculated at the effective interest rate and credited to the income statement under the heading "Other financial income".

Upon initial recognition, these financial assets are recorded at fair value plus transaction costs attributable to their acquisition. They are subsequently adjusted at each reporting date to fair value based on quoted prices where possible or using the discounted future cash flow method, or by reference to external sources otherwise.

1.3.16.1.2 Financial assets carried at fair value through profit and loss

Financial assets carried at fair value through profit and loss are classified as such at the inception of the operation when they are:

- assets acquired from inception with the intention of resale in the short term;
- derivatives not classified as hedges (derivatives held for trading);
- equity instruments (non-consolidated investments) for which the Group has not made the irrevocable option to classify them as at fair value through OCI with no recycling;
- debt securities that are not managed under the "collect and sell" business model and do not meet the requirements of the SPPI test. This chiefly concerns shares in investment funds, which are debt securities that do not pass the SPPI test regardless of the business model.

These assets are recorded at the transaction date at fair value, which is generally equal to the amount of cash paid out. Transaction costs directly attributable to the acquisition are recorded in the income statement. At each subsequent reporting date they are adjusted to fair value, based on quoted prices, or using recognised valuation techniques such as the discounted cash flow method or reference to external sources for other financial instruments.

Changes in fair value other than those concerning commodity contracts are recorded in the income statement under the heading "Other financial income and expenses".

Changes in the fair value of commodity trading contracts are recorded in the income statement under "Sales".

Changes in the fair value of certain non-trading commodity transactions are reported separately on a specific line of the income statement, "Net changes in fair value on Energy and Commodity derivatives, excluding trading activities" below the operating profit before depreciation and amortisation. These are transactions in the scope of IFRS 9, which for accounting purposes are not eligible for hedge accounting or the IFRS 9 "own use" exemption (see note 1.3.16.3).

1.3.16.1.3 Loans and financial receivables

Loans and financial receivables are carried at amortised cost if the business model involves holding the instrument in order to collect contractual cash flows which consist entirely of principal and interest.

Interest received is calculated under the effective interest rate method and recorded in "Other financial income" in the income statement.

Loans and financial receivables that do not qualify for classification at amortised cost are classified as at fair value through profit and loss, via "Other financial income and expenses" in the income statement.

1.3.16.1.4 Loans and financial liabilities

When specific hedge accounting treatments are not applied (see note 1.3.16.3 (A)), loans and financial liabilities are recorded at amortised cost, with separation of embedded derivatives where applicable. Interest expenses are calculated at the effective interest rate and recorded in the income statement under the heading "Cost of gross financial indebtedness" over the duration of the loan or financial liability.

1.3.16.2 Impairment of financial assets carried at fair value through OCI or at amortised cost

IFRS 9 establishes an impairment model based on expected credit loss (ECL).

For securities in the bond portfolio, the Group applies a rating-based approach for counterparties with low credit risk. In application of the risk management policy, the Group's bond portfolio consists almost entirely of instruments issued by low-risk counterparties rated "Investment Grade".

In this situation, the ECL is estimated over a 12-month horizon following the closing date.

The threshold marking a significant increase in credit risk is reached when the counterparty ceases to be rated "Investment Grade". In such situations, the significant increase in the default risk may lead to reassessment of ECLs over the instrument's residual life.

For loans and receivables, the Group has chosen an approach based on the probability of default by the counterparty and assessment of changes in the credit risk.

1.3.16.3 Derivatives

1.3.16.3.1 Scope

The scope of derivatives applied by the Group corresponds to the principles set out in IFRS 9.

In particular, forward purchases and sales for physical delivery of energy or commodities are considered to fall outside the scope of application of IFRS 9 when the contract concerned is considered to have been entered into as part of the Group's normal business activity ("own use"). This is demonstrated to be the case when all the following conditions are fulfilled:

- a physical delivery takes place under all such contracts;
- the volumes purchased or sold under the contracts correspond to the Group's operating requirements;
- the contracts cannot be considered as options as defined by the standard. In the specific case of electricity sale contracts, the contract is equivalent to a firm forward sale or can be considered as a capacity sale.

The Group considers that transactions negotiated with a view to balancing the volumes between electricity purchase and sale commitments are part of its business as an integrated electricity operator, and are outside the scope of IFRS 9.

The Group analyses all its contracts concerning financial liabilities or non-financial items, to identify any "embedded" derivatives. Any component of a contract that affects the cash flows of that contract in the same way as a stand-alone derivative corresponds to the definition of an embedded derivative and is recognised separately at fair value from the contract's inception date.

1.3.16.3.2 Measurement and recognition

Derivatives are initially recorded at fair value, based on quoted prices and market data available from external sources. If no quoted prices are available, the Group may refer to recent comparable transactions or if no such transactions exist base its valuation on internal models that are recognised by market participants, giving priority to information directly derived from observable data, such as over-the-counter listings.

Changes in the fair value of these derivatives are recorded in the income statement, unless they are designated as hedges for a cash flow or net investment. Changes in the fair value of such hedging instruments are recorded directly in equity, excluding the ineffective portion of the hedge.

In the specific case of financial instruments entered into as part of the trading business, realised and unrealised gains and losses are reported net under the heading "Sales".

In application of IFRS 13, the fair value of derivatives incorporates the counterparty credit risk for derivative assets and the own credit risk for derivative liabilities. The probabilities of default used to calculate these credit risks are based on historical data.

1.3.16.3.3 Derivatives classified as hedges

The EDF group uses derivatives to hedge its foreign exchange and interest rate risks, as well as risks related to certain commodity contracts.

The Group applies the criteria defined by IFRS 9 to identify operations subject to hedge accounting:

- the hedging relationship must only concern eligible hedging instruments and hedged items;
- the hedging relationship must be formally designated as such and have structured documentation from its inception;
- the hedging relationship must meet hedging efficiency requirements, particularly respect of a hedging ratio.

In the case of cash flow hedges, the future transaction being hedged must be highly probable.

The hedging relationship ends when it ceases to satisfy the above criteria. This includes situations in which the hedging instrument expires or is sold, terminated or exercised, or when the risk management objectives initially documented are no longer met.

Only derivatives external to the Group, and internal derivatives that are matched with similar transactions external to the Group, qualify for hedge accounting.

The Group uses the following categories for hedges:

(A) Fair value hedges

These instruments hedge the exposure to changes in the fair value of an asset or liability recorded in the balance sheet, or a firm commitment to purchase or sell an asset. Changes in the fair value of the hedged item attributable to the hedged component of that item are recorded in the income statement and offset by corresponding variations in the fair value of the hedging instrument. Only the ineffective portion of the hedge has an impact on income.

Some loans and financial liabilities are covered by a fair value hedge. In application of hedge accounting, their balance sheet value is adjusted for changes in fair value attributable to the hedged risks (foreign exchange and interest rate risks).

(B) Cash flow hedges

These instruments hedge exposure to variability in cash flows associated with an asset or liability, or a highly probable future transaction, for which variations in cash flows generated by the hedged item are offset by changes in the value of the hedging instrument.

The effective portion of accumulated changes in the hedge's fair value is recorded in equity, and the ineffective portion (i.e. changes in the fair value of the hedging instrument in excess of changes in the fair value of the hedged item) is recorded in the income statement.

When the hedged cash flows materialize, the amounts previously recognised in equity are recycled to profit and loss in the same way as for the hedged item, or are treated as an adjustment to the value of the asset acquired.

(C) Hedges of a net investment

These instruments hedge exposure to the foreign exchange risk related to a net investment in an entity which does not have the same functional currency as the Group. The effective portion of accumulated changes in the hedge's fair value is recorded in equity until the disposal or liquidation of the net investment, when it is included in the gain or loss on disposal. The ineffective portion (defined in the same way as for cash flow hedges) is recorded directly in the income statement.

The change in fair value resulting from the foreign exchange effect and interest rate effect of derivatives hedging a net investment in a foreign operation is recorded in equity.

1.3.16.4 Derecognition of financial assets and liabilities

The Group derecognises a financial asset when:

- the contractual rights to the cash flows generated by the asset expire; or
- the Group transfers the rights to receive contractual cash flows related to the financial asset through the transfer of substantially all of the risks and rewards associated with ownership of the asset.

Any interest created or retained by the Group in transferred financial assets is recorded as a separate asset or liability.

- The Group derecognises a financial liability when its contractual obligations are extinguished, cancelled or expire. When a debt is renegotiated with a lender on substantially different terms, a new liability is recognised.

1.3.16.5 Assignment of receivables

When it can be demonstrated that the Group has transferred substantially all the risks and benefits related to assignment of receivables, particularly the credit risk, the items concerned are derecognised.

Otherwise, the operation is considered as a financing operation, and the receivables remain in the balance sheet assets, with recognition of a corresponding financial liability.

1.3.17 Inventories

Inventories are recognised at the lower of acquisition cost or net realisable value, except for inventories held for trading activities, which are carried at market value. Inventories consumed are generally valued by the weighted average unit cost method.

Cost includes all direct material costs, labour costs, and a share of indirect production costs.

1.3.17.1 Nuclear fuel and materials

Inventory accounts include:

- nuclear materials, whatever their form during the fuel production cycle;
- and fuel components in the warehouse or in the reactor.

The stated value of nuclear fuel and materials and work-in-progress is determined based on direct processing costs including materials, labour and subcontracted services (e.g. fluoration, enrichment, production, etc.).

In accordance with regulatory obligations specific to each country, inventories of fuel (new or not entirely consumed) may also comprise expenses for spent fuel management and long-term radioactive waste management, with corresponding provisions or debts in the liabilities, or full and final payments made when the fuel is loaded.

In France, in application of the concept of "loaded fuel" as defined in the decision of 21 March 2007, the cost of inventories for fuel loaded in the reactors but not yet irradiated includes expenses for spent fuel management and long-term radioactive waste management. The corresponding amounts are taken into account in the relevant provisions.

In compliance with IAS 23, interest expenses incurred in financing inventories of nuclear fuels are charged to expenses for the period provided these inventories are manufactured in large quantities on a repetitive basis.

Nuclear fuel consumption is determined by component (natural uranium, fluoration, enrichment, fuel assembly production) as a proportion of the expected output when the fuel is loaded in the reactor. These quantities are valued at weighted average cost of inventories. Inventories are periodically corrected in view of forecast spent quantities based on neutronic measurements and physical inventories.

1.3.17.2 Other operating inventories

Other operating inventories comprise:

- fossil fuels required for operation of fossil-fired power plants;
- operating materials and equipment such as spare parts supplied under a maintenance programme (excluding capitalised strategic safety spare parts);
- certificates issued under the various environmental schemes (see note 1.3.27);
- certificates issued under capacity obligation mechanisms (capacity guarantees in France – see note 4.5);
- goods and services in progress, particularly relating to the businesses of EDF Renewables, Dalkia and Framatome;
- gas stocks.

Other non-trading operating inventories are generally valued at weighted average cost including direct and indirect purchasing costs.

Impairment of spare parts principally depends on the turnover of these parts.

Inventories held for trading purposes are stated at market value.

1.3.18 Trade receivables

Trade receivables are initially recognised at the fair value of the consideration received or receivable, and subsequently carried at amortised cost or at fair value through OCI.

Trade receivables also include the value of unbilled receivables for energy already supplied, which are presented net of advances received from customers who pay in regular monthly instalments.

The Group applies IFRS 9's simplified approach to measure expected credit losses on trade receivables, using provision matrices established on the basis of credit loss histories.

1.3.19 Cash and cash equivalents

Cash and cash equivalents comprise immediately available liquidities and very short-term investments that are readily convertible into a known amount of cash, usually maturing within three months or less of the acquisition date, and with negligible risk of fluctuation in value.

Securities held short-term and classified as "Cash equivalents" are recorded at fair value, with changes in fair value included in the heading "Other financial income and expenses".

1.3.20 Equity

1.3.20.1 Fair value adjustment of financial instruments

The fair value adjustment of financial instruments results from the restatement to fair value of debt and equity securities and certain hedging instruments.

1.3.20.2 Share issue expenses

Share issue expenses correspond exclusively to external costs expressly related to the capital increase. They are charged against the issue premium at their net-of-tax value.

Other expenses are classified as expenses of the period.

1.3.20.3 Treasury shares

Treasury shares are shares issued by EDF and held either by that company or by other entities in the consolidated Group. They are valued at acquisition cost and deducted from equity until the date of disposal. Net gains or losses on disposals of treasury shares are directly included in equity and do not affect net income.

1.3.20.4 Perpetual subordinated bonds

The perpetual subordinated bonds issued by the Group ("hybrid" bond issue) incorporate options for redemption at the initiative of EDF. These options may be exercised after a minimum period that depends on the specific terms of each issue, and subsequently at each coupon date or in the event of highly specific circumstances (such as a change in IFRS or tax regime). The annual yield is fixed and reviewable based on contractual clauses that vary according to the specific terms of the issuance. There is no obligation for EDF to make any payment, due to the existence of contractual clauses entitling it to defer payment indefinitely. However, those clauses stipulate that any deferred payments must be made in the event of a dividend distribution. All these features give EDF an unconditional right to avoid paying out cash or another financial asset for the principal or interest. Consequently, in compliance with IAS 32, these bonds are recorded as equity instruments and any payment made is treated in the same way as dividends (see notes 3.5, 3.6 and 27.4).

1.3.21 Provisions other than employee benefit provisions

The Group recognises provisions when it has a present obligation (legal or constructive) arising from a past event, an outflow of resources will probably be required to settle the obligation, and the obligation amount can be estimated reliably.

If it is anticipated that all or part of the expenses covered by a provision will be reimbursed, the reimbursement is recognised under receivables if and only if the Group is virtually certain of receiving it.

Provisions are determined based on the Group's expectation of the cost necessary to settle the obligation. Estimates are based on management data from the information system, assumptions adopted by the Group, and if necessary experience of similar transactions, or in some cases based on independent expert reports or contractor quotes. The various assumptions are reviewed for each closing of the accounts.

The expected costs are estimated based on year-end economic conditions and spread over a forecast disbursement schedule. They are then adjusted to Euros of the year of payment through application of a forecast long-term inflation rate and discounted to present value using a nominal discount rate. The provisions are based on these discounted future cash flows.

The rate of inflation and the discount rate are based on the economic and regulatory parameters of the country where the economic entity is located, considering the long operating cycle of the Group's assets and the maturities of commitments.

The discount effect generated at each closing to reflect the passage of time is recorded under "Discount effect" in financial expenses.

In extremely rare situations, a provision cannot be booked due to lack of a reliable estimate. In such cases, the obligation is mentioned in the notes as a contingent liability, unless there is little likelihood of an outflow of resources.

1.3.21.1 Provisions related to nuclear generation

Provisions related to nuclear generation mainly cover the following:

- back-end nuclear cycle expenses: provisions for spent fuel management, for waste removal and conditioning and long-term radioactive waste management are established in accordance with the obligations and final contributions specific to each country;
- costs for decommissioning power plants and losses relating to fuel in the reactor when the reactor is shut down (provision for last cores).
- Last core expenses correspond to the loss on fuel in the reactor that is not totally spent at the time of final reactor shutdown and cannot be reused due to technical and regulatory constraints, and the cost of fuel processing, and removal and storage of the resulting waste.

Changes in provisions resulting from a change in discount rates, a change in the disbursement schedule or a change in contractor quote are recorded:

- as an increase or decrease in the corresponding assets, up to the net book value, if the provision was initially covered by balance sheet assets (decommissioning of plants still in operation, long-term management of the radioactive waste resulting from such decommissioning, and last cores);
- in the income statement in all other cases.

Detailed information on the principles for determining provisions related to nuclear generation in France and the United Kingdom is given in note 29.

1.3.21.2 Other provisions

Other provisions primarily concern:

- contingencies related to subsidiaries and investments;
- tax liabilities;
- litigation;
- onerous contracts and losses on completion;

- environmental schemes.

Provisions for onerous contracts primarily relate to multi-year agreements for the purchase or sale of energy:

- losses on energy purchase agreements are measured by comparing the acquisition cost under the contractual terms with the forecast market price;
- losses on energy sale agreements are measured by comparing the estimated income under the contractual terms with the cost of the energy to be supplied.

The revenues and margin on Framatome's long-term contracts are recorded under the percentage-of-completion method. When the estimated result upon completion is negative, the loss is immediately recorded in profit and loss, after deducting the loss already recognised under the percentage-of-completion method, and a provision is booked.

Provisions for environmental schemes may be established to cover the shortfall in greenhouse gas emission quotas, renewable energy certificates, and energy savings certificates, compared to the assigned targets (see note 1.3.27).

In extremely rare cases, description of a specific litigation covered by a provision may be omitted from the notes to the financial statements if such disclosure could cause serious prejudice to the Group.

1.3.22 Provisions for employee benefits

The Group grants its employees post-employment benefits (pension plans, retirement indemnities, etc) and other long-term benefits (e.g. long-service awards) in compliance with the specific laws and measures in force in each country where it does business.

1.3.22.1 Calculation and recognition of employee benefits

Obligations under defined-benefit plans are calculated by the projected unit credit method, which determines the present value of entitlements earned by employees at year-end under all types of plan, taking into consideration the prospects for wage increases and each country's specific economic conditions.

Post-employment benefit obligations are valued mainly using the following methods and assumptions:

- retirement age, determined on the basis of the applicable rules for each plan, and the requirements to qualify for a full pension;
- career-end salary levels, with reference to employee seniority, projected salary levels at the time of retirement based on the expected effects of career advancement, and estimated trends in pension levels;
- forecast numbers of pensioners, determined based on employee turnover rates and mortality data available in each country;
- reversion pensions where relevant, taking into account both the life expectancy of the employee and his/her spouse and the marriage rate;
- a discount rate that depends on the geographical zone and the duration of the obligations, determined at the year-end date by reference to the market yield on high-quality corporate bonds or the rate on government bonds whose duration is coherent with EDF group's commitments to employees.

The amount of the provision corresponds to the value of obligations less the fair value of the fund assets that cover those obligations.

The net expense booked during the year for employee benefit obligations includes:

- in the income statement:
  - the current service cost, corresponding to additional benefit entitlements earned during the year,
  - the net interest expense, corresponding to interest on obligations net of the return on fund assets, which is calculated using the same discount rate as for the obligations,
  - the past service cost, including the income or expense related to amendments or settlements of benefit plans or introduction of new plans,
  - the actuarial gains and losses relating to other long-term benefits;

- in other components of consolidated comprehensive income:
  - the actuarial gains and losses relating to post-employment benefits,
  - the effect of the limitation to the asset ceiling if any.

1.3.22.2 Post-employment benefit obligations

When they retire, Group employees benefit from pensions determined under local rules. They may also be entitled to benefits directly paid by the companies, and additional benefits prescribed by the relevant regulations.

1.3.22.2.1 French entities covered by the IEG system

Entities belonging to the specific IEG (electricity and gas) sector system, namely EDF, Enedis, the CTE subgroup, Électricité de Strasbourg, EDF PEI and certain subsidiaries of the Dalkia subgroup, are Group companies where almost all employees benefit from the IEG statutes, including the special pension system and other statutory benefits.

Since the financing reform for the IEG sector system took effect on 1 January 2005, the CNIEG *(Caisse Nationale des IEG*, the sector's specific pension body) has managed not only the special IEG pension system, but also the industrial accident, invalidity and death insurance system for the sector.

The CNIEG is a social security body governed by private law, formed by the Law of 9 August 2004. It has legal entity status and reports to the French government, operating under the joint supervision of France's ministers for the Budget, Social Security and Energy.

Under the funding arrangements introduced by the Law, IEG sector companies establish pension provisions to cover entitlements not funded by France's standard systems (CNAV, AGIRC and ARRCO), to which the IEG system is affiliated, or by the CTA (*Contribution Tarifaire d'Acheminement*) levy on gas and electricity transmission and distribution services.

As a result of this funding mechanism, any change (whether favourable or unfavourable to employees) in the standard French pension system that is not passed on to the IEG pension system is likely to cause a variation in the amount of the provisions recorded by the Group to cover its obligations.

The obligations concerned by the pensions and for which a provision is recorded thus include:

- specific benefits of employees in the deregulated or competitive activities;
- specific benefits earned by employees from 1 January 2005 for the regulated activities (transmission and distribution) (benefits earned prior to that date are financed by the CTA levy).

In addition to pensions, other benefits are granted to IEG status former employees (not currently in active service), as detailed below:

- benefits in kind: Article 28 of the IEG national statutes entitles such employees and current employees to benefits in kind in the form of supplies of electricity or gas at preferential prices. The obligation for supplies of energy to employees of the EDF and Engie (formerly GDF-Suez) groups corresponds to the probable present value of kWh to be supplied to beneficiaries or their dependants during their retirement, valued on the basis of the unit cost. It also includes the payment made under the energy exchange agreement with Engie;
- retirement gratuities: these are paid upon retirement to employees due to receive the statutory old-age pension, or to their dependants if the employee dies before reaching retirement. These obligations are almost totally covered by an insurance policy;
- bereavement benefit: this is paid out upon the death of an inactive or disabled employee, in order to provide financial assistance for the expenses incurred at such a time (Article 26 - § 5 of the National Statutes). It is paid to the deceased's principal dependants (statutory indemnity equal to three months' pension, subject to a ceiling) or to a third party that has paid funeral costs (discretionary indemnity equal to the costs incurred);
- bonus pre-retirement paid leave: all employees eligible to benefit immediately from the statutory old-age pension and aged at least 55 at their retirement date are entitled to 18 days of bonus paid leave during the last twelve months of their employment;
- other benefits include help with the cost of studies, time banking for pre-retirement leave, and pensions for personnel sent on secondment to subsidiaries not covered by the IEG system.

1.3.22.2.2 French and foreign subsidiaries not covered by the special IEG system

Pension obligations principally relate to the British companies and are mostly covered by defined-benefit plans.

In the United Kingdom, EDF Energy has three principal defined-benefit pension plans:

- the British Energy Generation Group (BEGG) plan affiliated to the Electricity Supply Pension Scheme (ESPS), of which the majority of members are employees in Nuclear Generation. The BEGG plan was closed to new members in August 2012;
- the EDF Energy Generation and Supply Group (EEGSG) plan, also affiliated to the ESPS, which was established in December 2010 for the employees remaining with EDF Energy following the transfer of the former Group plan to UK Power Networks as part of the sale of the Networks. The EEGSG plan has not accepted any new members since then;
- the EDF Energy Pension Scheme (EEPS). This scheme was established in March 2004 and membership remains open to new employees.

In 2016 EDF Energy introduced a new defined-benefit section of the EEPS pension plan named EEPS CARE (Career Average Revalued Earnings). Under EEPS CARE, pensions are based on a pensionable salary corresponding to the average salary over the beneficiary's entire career, adjusted for inflation. In December 2017 a CARE section was also introduced in the BEGG pension plan, open to new employees in Nuclear Generation on equivalent terms to the corresponding section of the EEPS pension plan. Pensions for the other sections continue to be based on the beneficiary's most recent pensionable salary.

Each pension plan is financially independent of the others. The BEGG and EEGSG plans are part of the industry-wide ESPS which is one of the largest private-sector pension schemes in the United Kingdom.

The plans are externally managed by separate trusts whose trustees are appointed by the firm and the plan participants to manage the funds in their exclusive interests. The trustees carry out an actuarial review of the plan every three years, defining the funding level, the necessary employer and employee contributions and the payment schedules. The trustees are responsible for defining the plans' investment strategy, in agreement with the firm.

1.3.22.3 Other long-term benefit obligations

These benefits concern employees currently in service, and are earned according to local regulations, particularly the statutory regulations for the electricity and gas sector for EDF and French subsidiaries covered by the IEG regime. They include:

- annuities following incapacity, invalidity, industrial accident or work-related illness; like their counterparts in the general national system, IEG employees are entitled to financial support in the event of industrial accident or work-related illness, and invalidity and incapacity annuities and benefits. The obligation is measured as the probable present value of future benefits payable to current beneficiaries, including any possible reversions;
- long-service awards;
- specific benefits for employees who have been in contact with asbestos.

1.3.23 Special concession liabilities

These liabilities represent the contractual obligations specific to the concession rules for public electricity distribution concessions in France, recognised in the liabilities as:

- rights in existing assets: these correspond to the grantor's right to recover all assets for nil consideration. This right comprises the value in kind of the facilities – the net book value of assets operated under concession – less any as yet unamortised financing provided by the operator;
- rights in assets to be replaced: these correspond to the operator's obligation to contribute to the financing of assets due for replacement. These non-financial liabilities comprise:
  - depreciation recorded on the portion of assets financed by the grantor,
  - the provision for renewal, exclusively for assets due for renewal before the end of the concession.

When assets are replaced, the provision and amortisation of the grantor's financing recorded in respect of the replaced item are eliminated and transferred to the rights in existing assets, since they are considered as the grantor's financing for the new asset. Any excess provision is taken to income.

During the concession, the grantor's rights in assets to be replaced are thus transferred upon the asset's renewal to become the grantor's rights in existing assets, with no outflow of cash to the benefit of the grantor.

In general, the value of special concession liabilities is determined as follows:

- the grantor's rights in existing assets, representing the share deemed to be held by the grantor in the concession assets, are valued on the basis of the assets recorded in the balance sheet;
- the obligations relating to assets to be replaced are valued on the basis of the estimated value of the relevant assets, measured at each year-end taking into consideration wear and tear on the asset at that date:
  - based on the difference between the asset's replacement value as assessed at year-end and the historical cost for calculation of the provision for renewal. Annual allocations to the provision are based on this difference, less any existing provisions, with the net amount spread over the residual useful life of the assets. Consequently, the expenses recognised for a given item increase over time,
  - based on the share of the asset's historical cost financed by the grantor for amortisation of the grantor's financing.

The Group considers that the obligations related to assets to be replaced are to be valued on the basis of the special clauses contained in the concession agreements. Under this approach, these obligations are stated at the value of the contractual obligations as calculated and reported annually in the reports to the grantors. This contractual value also reflects the possibility that the EDF group may one day lose its status as the concession operator.

If no such clauses existed, an alternative approach would be to state contractual obligations at the present value of future payments required for replacement of assets operated under concession at the end of their industrial useful life.

For information, the Group reports below the impacts of this alternative approach, *i.e.* the discounting of the future obligation to contribute to financing of assets to be replaced.

The principal assumptions used in preparing this simulation are as follows:

- the basis for calculation of the provision for renewal is the estimated replacement value at the end of the asset's useful life, applying a forecast annual inflation rate of 1.5%, less the asset's historical value. This amount is based on the wear and tear on the asset and discounted at a rate of 3.9%;
- amortisation of the grantor's financing is also discounted at the rate of 3.9%.

The following table shows the impacts of this simulation for Enedis in 2018:

- Impacts on the income statement

(in millions of euros, before taxes)	2018
Operating profit	132
Financial result	(571)
Income before taxes of consolidated companies	(439)

- Impacts on the balance sheet – equity

(in millions of euros, before taxes)	2018
At opening date	1,690
At closing date	1,251

Valuation of concession liabilities under this method is subject to uncertainty over costs and disbursements, and is also sensitive to inflation and discount rates.

1.3.24 Investment subsidies

Investment subsidies received by Group companies are included in liabilities under the heading "Other liabilities" and transferred to income as and when the economic benefits of the corresponding assets are utilised.

1.3.25 Assets classified as held for sale and related liabilities, and discontinued operations

Assets that qualify as held for sale and related liabilities are disclosed separately from other assets and liabilities in the balance sheet.

When assets or groups of assets are classified as discontinued operations, income and expenses relating to these discontinued operations are disclosed in a single net amount after taxes in the income statement and net changes in cash and cash equivalents of discontinued operations are also reported separately in the cash flow statement.

Impairment is booked when the realisable value is lower than the net book value.

1.3.26 Nature and extent of restrictions on the Group's ability to access and use assets or settle liabilities

The main restrictions that may limit the Group's ability to access or use its assets or settle its liabilities concern the following items:

- Assets held to fund employee benefits (principally in France and the United Kingdom – see note 1.3.22) and expenses related to nuclear liabilities (principally in France – see note 45 – and the United Kingdom – see note 29.2);
- Tangible and intangible assets and the related liabilities associated with concession agreements, whether or not they are subject to regulatory mechanisms (obligations to supply energy or energy-related services, rules governing investments, an obligation to return concession facilities at the end of the contract, amounts payable at the end of the contract, tariff constraints, etc). These restrictions mainly apply to assets of this type in France (EDF, Enedis and Dalkia), and to a lesser extent Italy (see notes 1.3.13 and 1.3.23);
- The sale of Group investments in certain subsidiaries requires authorisations from State bodies, particularly when they exercise a regulated activity or operate nuclear power plants (this is the case for EDF Nuclear Generation Ltd. in the United Kingdom, Taishan (TNPJVC) in China and CENG in the United States);
- Prudential reserves established and measures taken as regards distribution capacity, so that the insurance subsidiaries will meet their prudential ratio requirements;
- The cash of certain entities that use financing arrangements stipulating that dividend distribution is subject to conditions concerning repayment of bank debt (or qualification for loans) and shareholders, or are subject to regulatory limitations in certain countries.

Certain shareholder agreements concerning companies controlled by the Group include clauses to protect minority shareholders, requiring approval from minority shareholders for certain particularly important decisions.

Finally, certain financing loans granted to Group entities contain early repayment clauses (see note 38.2.6), and certain items of cash and cash equivalents are subject to restrictions (see note 37).

1.3.27 Environment

1.3.27.1 Greenhouse gas emission rights

The system currently in force is described in note 49.1.

The accounting treatment of emission rights depends on the holding intention. There are two economic models, both of which coexist in the EDF group.

Rights held under the "Trading" model are included in inventories at fair value. The change in fair value observed over the year is recorded in the income statement.

Rights held to comply with regulatory requirements on greenhouse gas emissions (the "Generation" model) are recorded in intangible assets:

- at acquisition cost when purchased on the market;
- at nil value when allocated free of charge (in countries that still have a free allocation system).

When the estimated emissions by a Group entity over a given period are higher than the rights allocated for no consideration for the period less any allocated rights sold on the spot or forward market, a provision is established to cover the excess emissions. This provision is equal to the shortfall in rights held (difference between actual emissions and allocated rights held at the closing date).

If no emission rights are allocated free of charge, a provision is systematically recorded equivalent to the actual emissions at the closing date.

In either case, the provision is measured on the basis of the acquisition cost up to the amount of rights acquired on the spot or forward markets, and on market prices for the balance. It is cancelled when the rights are surrendered to the State.

At the closing date, the portfolio of emission rights and the obligation to surrender rights for the emissions of the year are presented gross, without netting.

If the number of purchased emission rights recorded as intangible assets at the end of the year and not subject to forward sale is higher than the number of purchased rights that will be surrendered to the State for the year's emissions, an impairment test must be applied to the excess. If the realisable value is lower than the net book value, impairment is booked.

1.3.27.2 Renewable energy certificates

The system currently in force is described in note 49.3.

The EDF group applies the following accounting treatments:

- for non-obligated electricity producers, certificates obtained based on generation output are recorded in "Other inventories" until they are sold on to suppliers;
- for obligated producers and an entity that both produces and supplies energy and is under an obligation to sell a specified quantity of renewable energy, the Group uses the following accounting treatments for certificates obtained based on generation output:
  - up to the level of the obligation, these certificates are not recognised,
  - certificates in excess of the obligation are recorded in "Other inventories",
  - in the specific situation when an entity is not in a position to meet its obligation at the year-end, the Group applies the following accounting treatment:
    - certificates acquired for a consideration in order to meet the obligation are recorded in intangible assets at acquisition cost, and
    - a provision is established equivalent to the shortfall in certificates compared to the obligation at the year-end. The value of this provision is based on the acquisition price of certificates already purchased on the spot or forward market, and market prices or penalty prices for the balance. The provision is cancelled when the certificates are surrendered to the State.

Forward purchases/sales of certificates related to trading activities are recorded in accordance with IFRS 9, stated at fair value in the balance sheet date. The change in fair value is recorded in the income statement.

1.3.27.3 Energy savings certificates

The system currently in force is described in note 49.2.

The EDF group fulfils its obligations either by taking measures regarding its assets or actions with its final customers in order to receive energy savings certificates from the State, or by purchasing energy savings certificates directly.

Expenses incurred to meet the cumulative energy savings obligation are treated as:

- property, plant and equipment if the action taken by the entity concerns its own assets and the expenses qualify for recognition as an asset;
- expenses for the year incurred, if they do not meet the requirements for capitalisation or if the action taken is to encourage third parties to save energy.

Expenses incurred in excess of the accumulated obligation at year-end are included in inventories until they are used to cover the obligation. A provision is recognised if the energy savings achieved are lower than the cumulative energy savings obligation. The amount of the provision is equal to the cost of actions still to be taken to meet the obligations related to the energy sales made.

1.3.27.4 Environmental expenses

Environmental expenses are identifiable expenses incurred to prevent, reduce or repair damage to the environment that has been or may be caused by the Group as a result of its activities. These expenses are treated as follows:

- they are capitalised if they are incurred to prevent or reduce future damage or protect resources;
- they are booked as environmental liabilities and increases to provisions for environmental risks if they correspond to an obligation that exists at the year-end and it is probable or certain at the reporting date that they will lead to an outflow of resources;
    - they are recognised as expenses if they are operating expenses for the bodies in charge of environmental concerns, environmental supervision, environmental duties and taxes, processing of liquid and gas effluents and non-radioactive waste, or research unrelated to an investment.

NOTE 2 COMPARABILITY

2.1 IFRS 15 – REVENUE FROM CONTRACTS WITH CUSTOMERS

IFRS 15 "Revenue from Contracts with Customers" became applicable on 1 January 2018 (see note 1.3.7).

The Group has applied the full retrospective approach, which has no impact on opening equity.

As a result of this change, sales and energy purchases reported at 31 December 2017 have been reduced by €4,740 million, with no impact on Operating profit before depreciation and amortisation. In the balance sheet, due to the new practice of netting unbilled receivables for energy already delivered with advances received from customers (see note 2.1.3.2), the trade receivables, other current receivables and other current liabilities reported at 31 December 2017 have been reduced by €6,568 million, €2,342 million and €8,910 million respectively.

In association with implementation of IFRS 15, the Group is monitoring changes in international standards that could affect the current accounting treatment of regulated-tariff activities.

The operations concerned by changes of accounting treatment are the following:

2.1.1 Recognition of income from energy delivery (the principal-agent distinction)

In France and Belgium, the Group concluded that delivery is a distinct service from the supply of energy, and that the energy supplier is acting as an agent in providing this delivery service.

In Italy and the UK, however, the energy supplier is classified as a principal for delivery services.

In France, the vast majority of electricity delivery services are performed by the French distribution network operator Enedis, which is a regulated subsidiary of the Group. Consequently the principal-agent distinction concerning electricity delivery in France only has an impact on presentation of sales in the reporting by operating segment.

These changes have led to a reduction of €1,527 million in reported sales for 2017 from gas and electricity delivery in Belgium and gas delivery in France (and electricity deliveries in France by non-Group Distribution

Network Operators), and a corresponding equal reduction in delivery expenses (included in fuel and energy purchases).

2.1.2 Recognition of market energy purchase and sale transactions that are part of optimisation activities

The analyses conducted have led the Group to consider that accounting on a net basis provides a more relevant reflection of the economic reality of optimisation transactions. As some Group entities (in Italy, Belgium and in France for Dalkia) previously reported such sales on a gross basis and booked a corresponding entry in energy purchases, this change results in a €2,793 million reduction in the sales and fuel and energy purchases reported at 31 December 2017.

2.1.3 Other impacts

2.1.3.1 Other impacts on the consolidated income statement

Other transactions previously recognised on a gross basis are also now presented on a net basis in application of IFRS 15: agency transactions in Italy and settlements made under the balancing mechanism for the French electricity network, totalling €420 million. These restatements have no impact on the Group's Operating profit before depreciation and amortisation as published at 31 December 2017.

2.1.3.2 Impacts on the consolidated balance sheet

Trade receivables, which include the amount of unbilled receivables for energy already delivered, are now presented net of advances received from customers who pay in regular monthly instalments.

This change causes a €6,568 million reduction in Trade receivables and Other current liabilities at 31 December 2017. The related netting of taxes on these amounts causes a decrease of €2,342 million at 31 December 2017 (reduction in "tax liabilities" in Other current liabilities, with a corresponding change in "tax receivables" in Other current receivables).

2.1.4 Summary of impacts on Group Operating profit before depreciation and amortisation and segment reporting

(in millions of euros)	31/12/2017 as published	Impacts of IFRS 15	31/12/2017 restated
Sales	69,632	(4,740)	64,892
Fuel and energy purchases	(37,641)	4,740	(32,901)
Other external expenses	(8,739)	-	(8,739)
Personnel expenses	(12,456)	-	(12,456)
Taxes other than income taxes	(3,541)	-	(3,541)
Other operating income and expenses	6,487	-	6,487
Operating profit before depreciation and amortisation	**13,742**	**-**	**13,742**

The table below summarises the segment information reported at 31 December 2017 and the restatements resulting from application of IFRS 15.

Figures published at 31 December 2017 (in millions of euros)	France – Generation and Supply	France – Regulated activities	United Kingdom	Italy	Other international [1]	Other activities [2]	Inter-segment eliminations	Total
External sales	34,533	5,732	8,681	9,918	4,649	6,119	-	69,632
Inter-segment sales	1,073	10,164	7	22	173	1,694	(13,133)	-
SALES AS PUBLISHED	35,606	15,896	8,688	9,940	4,822	7,813	(13,133)	69,632
IFRS 15 restatements								
External sales	(10,607)	10,041	-	(2,218)	(1,656)	(300)	-	(4,740)
Inter-segment sales	-	(10,101)	-	-	-	-	10,101	-
SALES	(10,607)	(60)	-	(2,218)	(1,656)	(300)	10,101	(4,740)
Restated figures at 31 December 2017								
External sales	23,926	15,773	8,681	7,700	2,993	5,819	-	64,892
Inter-segment sales	1,073	63	7	22	173	1,694	(3,032)	-
SALES AFTER RESTATEMENTS	24,999	15,836	8,688	7,722	3,166	7,513	(3,032)	64,892

(1) IFRS 15 restatements only concern EDF Luminus (Belgium).
(2) Including EDF Renewables (€1,280 million) and Dalkia (€3,751 million after IFRS 15 restatements).

The reporting by operating segment has also been modified from 1 January 2018, and the comparative figures at 31 December 2017 have been restated accordingly (see note 6).

2.2 IFRS 9 – FINANCIAL INSTRUMENTS

IFRS 9 "Financial Instruments" became mandatory on 1 January 2018. It introduces new principles for classification and measurement of financial instruments, impairment for credit risk on financial assets, and hedge accounting, as presented in note 1.3.16.

2.2.1 Transition measures

In application of the simplified approach allowed by IFRS 9, the comparative figures for the first year of application have not been restated. Consequently:

- Any difference between the book value of financial assets and liabilities at 31 December 2017 and at 1 January 2018 is recorded in the opening balance of consolidated reserves;
- Financial assets are not reclassified under IFRS 9 categories in the comparative balance sheet. Consequently, the "Available-for-sale financial assets" category is still shown in the 2017 comparative information (see note 36.1);
- Impairment for the comparative period has not been restated;
- The hedge accounting rules of IFRS 9 are applied prospectively. The transition has not resulted in disqualification of any hedging relationship.

The main impacts of application of IFRS 9 are described in more detail below. The impacts on income statement figures published at 31 December 2017 are provided for information and comparability with the income statement at 31 December 2018.

2.2.2 Principal impacts of IFRS 9 for the Group

2.2.2.1 Classification and measurement

The Group's financial assets classified as "Available For Sale" (AFS) under IAS 39 are now carried at fair value through Other comprehensive income (OCI with recycling or with no recycling) or at fair value through profit and loss.

The main impacts of application of IFRS 9 in the Group concern financial assets held in the form of shares in investment funds, and to a lesser degree the equity instruments (shares) held.

- For shares in **investment funds**, unrealised gains or losses, which were previously recognised in OCI with recycling to profit and loss upon derecognition, are now recorded directly in the Group's income statement in accordance with their IFRS 9 classification.
  - These instruments were stated in the balance sheet at 31 December 2017 at the value of €18,382 million. The change in fair value at 1 January 2018, amounting to a total €1,807 million before tax (€1,172 million after tax), which was previously recognised in OCI with recycling under IAS 39, is reclassified in full to other consolidated reserves with no future recycling to profit and loss.
- For **equity instruments** not held for trading, the Group records fair value changes on most of the instruments in the portfolio at 31 December 2017 in profit and loss. However, for some of the securities in the portfolio at 31 December 2017, the Group has exercised the irrevocable option to recognise fair value changes in OCI with no recycling.
  - These instruments were stated in the balance sheet at 31 December 2017 at the value of €1,679 million. The change in fair value at 1 January 2018, amounting to a total €135 million before tax (€87 million after tax), is reclassified in full to other consolidated reserves with no future recycling to profit and loss.
- The portfolio of **debt securities, particularly bonds**, was stated in the balance sheet at 31 December 2017 at the value of €20,863 million.

  Of this total, €20,828 million is managed under the "collect and sell" business model and passes the SPPI test. As a result, fair value changes on this section of the portfolio are recorded in OCI with recycling, continuing the previous accounting treatment.
  - The change in the fair value of these instruments remaining in OCI with recycling amounts to €245 million before tax (€162 million after tax) at 1 January 2018.
- The balance of the portfolio (€35 million at 31 December 2017) is now carried at fair value through profit and loss.
  - On these instruments, the change in fair value at 1 January 2018, amounting to a total €3 million before tax (€2 million after tax), is reclassified in full to other consolidated reserves with no future recycling to profit and loss.

A large portion of the financial assets affected by these changes belongs to dedicated asset portfolio (amounting to a total €20,848 million at 31 December 2017 – see note 36.2) held to cover future expenses for the back-end of EDF's nuclear cycle in France (see note 45).

In general, application of IFRS 9 causes greater volatility in the Group's income statement. Meanwhile, dedicated assets are held to cover provisions for the back-end of the nuclear cycle, which give rise to a recurring cost of unwinding the discount, which is included in the financial result.

The table below summarises changes in the classification of financial assets held by the Group at 31 December 2017 between IAS 39 and IFRS 9, and the impacts on the Group's financial statements.

(in millions of euros)		IFRS 9 classification					
IAS 39 classification	Balances at 31/12/2017 restated [1]	Amortised cost	Fair value through OCI with recycling	Fair value through OCI with no recycling	Fair value through P&L	Gross fair value reserve at 01/01/2018	Net fair value reserve (after tax) at 01/01/18 [2]
Available-for-sale financial assets	40,924	-	20,828	444	19,652	2 190	1 423
EDF's dedicated assets	20,848	-	4,992	-	15,856	2 114	1 347
EDF's liquid assets	18,963	-	15,815	-	3,148	73	73
Other assets	1,113	-	21	444	648	3	3
Loans and receivables	14,622	14,330	-	-	292	-	-
Trade receivables [3]	16,843	15,187	1,656	-	-	-	-

(1) See notes 36.2.2 and 36.3 respectively to the 2017 consolidated financial statements for details of available-for-sale financial assets and loans and receivables. The amount of trade receivables has been restated for the impacts of IFRS 15 (see note 2.1.3.2).

(2) Corresponding to the cumulative changes in fair value, after tax, on unrealised gains and losses on shares in investment funds (€1,172 million), equity instruments (€87 million) and debt securities, notably bonds (€164 million).

(3) Trade receivables of Edison (Italy) are managed under the "collect and sell" model and are therefore classified in the "Fair value through OCI with recycling" category.

2.2.2.2 Impairment

Retrospective application of the IFRS 9 impairment model to all the financial assets concerned leads to recognition of an impact of €(34) million (net of tax) in opening reserves.

2.2.2.3 Hedge accounting

Retrospective application of the IFRS 9 hedge accounting rules had no impact on opening reserves since all hedging relationships were continued at 1 January 2018.

2.2.2.4 Debt modification

The accounting treatment under IFRS 9 of debt modifications that do not result in derecognition was clarified by the IASB in July 2017. This standard requires the change in amortised cost of the debt at the modification date to be recorded in profit and loss, in contrast to the current practice of spreading the adjustment over the residual term of the modified debt.

The impact of retrospective application at 1 January 2018 of this clarification of IFRS 9 on the Group's opening reserves amounts to €28 million (net of tax).

2.2.2.5 Summary of impacts in terms of changes in Group equity (after tax) at 1 January 2018

Impacts in millions of euros (net of tax)	Revaluation differences on financial instruments (OCI with recycling)	Other consolidated reserves and net income [1]
Equity as published at 31/12/2017	**(306)**	**40,103**
- Fair value adjustments to financial instruments that no longer transit via OCI with recycling [2]	(1,261)	1,261
- Associates' and joint ventures' share of these fair value adjustments	(159)	159
- Impairment (see note 2.2.2.2)	6	(34)
- Debt modification (see note 2.2.2.4)	-	28
	(1,414)	*1,414*
Equity after restatements at 01/01/2018	***(1,720)***	**41,517**

(1) Fair value changes recorded in OCI with no recycling are presented in the column "Other consolidated reserves and net income".
(2) At 31 December 2017, the cumulative changes in fair value, after tax, on unrealised gains and losses on shares in investment funds (€1,172 million), equity instruments subject to the OCI with no recycling option (€87 million) and debt securities, notably bonds (€2 million) (see note 2.2.2.1).

2.2.2.6 Information regarding the impacts on 2017 net income of application of IFRS 9 to financial assets

The impact of application of IFRS 9 instead of IAS 39 on the Group's net income at 31 December 2017 is provided for information and comparability purposes. The main impacts concern financial assets carried at fair value through OCI with no recycling or through profit and loss. On those instruments, all other things being equal, the impact on the financial result would have been €215 million (€176 million on the net income), consisting of:

- Non-recognition of the gains or losses on sale realised in 2017 in the amount of €(931) million, including €(985) million related to dedicated assets (see note 15.3);
- Recognition in income of changes in the fair value of these instruments during 2017, representing the volatility over the period of €1,146 million including €1,158 million related to dedicated assets.

(in millions of euros)	**2017 as published**	IFRS 9 restatements	**2017 restated**
Operating profit before depreciation and amortisation	**13,742**		**13,742**
Operating profit	**5,637**		**5,637**
Cost of gross financial indebtedness	(1,778)		(1,778)
Discount effect	(2,959)		(2,959)
Other financial income and expenses	2,501	215	2,716
Financial result	**(2,236)**	**215**	**(2,021)**
Income taxes	(147)	(96)	(243)
Share in net income of associates and joint ventures [1]	35	57	92
GROUP NET INCOME	3,289	176	3,465

(1) Relates to the investment in CENG.

NOTE 3 SIGNIFICANT EVENTS AND TRANSACTIONS

3.1 THE FIRST OF TWO EPR REACTORS AT CHINA'S TAISHAN NUCLEAR POWER PLANT BEGINS COMMERCIAL OPERATION

On 14 December 2018, CGN and EDF announced that Taishan nuclear power plant's unit 1 had become the world's first EPR to begin commercial operation. This last milestone was reached on 13 December 2018 after successful completion of the final statutory test of continuous operation at full power for 168 hours, which showed that all the requirements for the reactor's safe operation were met.

Comprising two 1750-MW EPR reactors, Taishan nuclear power plant is the biggest cooperation project to have taken place between China and France in the energy sector. Taishan's two reactors are capable of supplying the Chinese power grid with up to 24TWh of carbon-free electricity a year, tantamount to the annual electricity consumption of 5 million Chinese users, whilst at the same time preventing the emission of 21 million tonnes of CO_2 a year.

The Taishan project is being led by TNPJVC, a joint venture founded by CGN (51%), EDF (30%) and a regional Chinese utility called Yuedian (19%). The EDF Group and its subsidiary Framatome supplied the third-generation EPR technology, which meets the highest international safety standards. EDF also contributed operating experience gained from the construction of its Flamanville 3 EPR, and this was a crucial factor in successfully completing the initial phases of the Taishan 1 construction project.

Taishan 1 is providing its experience in project management and technological expertise for EPRs around the world. The first reactors to benefit from this experience are the two Hinkley Point C units currently being built in the UK. EDF and CGN are partners in two other British projects: the Sizewell C EPR project, and the Bradwell B project which is based on Hualong technology.

3.2 SALE OF A PORTFOLIO OF MORE THAN 200 REAL ESTATE AND BUSINESS ASSETS BY THE EDF GROUP TO COLONY CAPITAL

On 28 November 2018, the EDF group, largely via its subsidiary Sofilo, completed the sale of a portfolio of over 200 office buildings and business assets to investment vehicles managed by Colony Capital.

This portfolio, whose assets are located in the Paris area and other regions in France, has a total surface area of approximately 430,000 m^2. The operation was coupled with an operating lease contract to the EDF group.

The closing of this transaction marks the completion of EDF Group's €10 billion asset disposal plan for 2015-2020.

3.3 COMPLETION OF THE SALE OF EDF'S STAKE IN DUNKERQUE LNG

Following a competitive auction process launched in early 2018, the EDF group announced on 29 June 2018 that it had entered into exclusive negotiations with two groups of investors for the disposal of its 65.01% interest in the share capital of Dunkerque LNG, owner and operator of the liquefied natural gas (LNG) terminal in Dunkirk.

A consortium composed of Fluxys, AXA Investment Managers – Real Assets, on behalf of its clients, and Crédit Agricole Assurances undertook to acquire a stake of 31%, and a consortium of Korean investors, led by IPM Group (comprised of InfraPartners Management Korea Co. Ltd. in Seoul and InfraPartners Management LLP in London) in collaboration with Samsung Asset Management Co., Ltd and consisting of Samsung Securities Co. Ltd., IBK Securities Co. Ltd. and Hanwha Investment & Securities Co. Ltd., acquired a stake of 34.01%.

Based on the prices paid by the two consortia, the average enterprise value for 100% of Dunkerque LNG amounted to €2.4 billion.

This transaction allowed Fluxys, already a 25% shareholder of Dunkerque LNG, to take control of and consolidate Dunkerque LNG with the support of Axa Investment Managers – Real Assets and Crédit Agricole Assurances.

EDF, as a customer of Dunkerque LNG, is still committed in the long term to the terminal, which will continue serving the Group's gas strategy.

The EDF group signed binding agreements for this sale with the same consortia on 12 July 2018.

Once the required regulatory approvals had been given, the EDF group completed the sale of its stake in the Dunkerque LNG terminal on 30 October 2018.

Following this sale, valuation of the long-term agreement between EDF and Dunkerque LNG for reservation of LNG regasification capacities led to recognition of a €737 million increase in provisions for onerous contract (see note 32). Due the gain of €755 million generated, this operation has a net impact of €18 million on other income and expenses (see note 14). It also contributes a €1.5 billion reduction in the EDF Group's net financial indebtedness, based on a sale price of approximately €1 billion net of cash transferred.

3.4 SENIOR BOND ISSUES: EDF RAISES $3.75 BILLION AND €1 BILLION

On 19 September 2018, EDF raised US$3.75 billion through 3 senior bond issues:

- A $1.8 billion bond, with 10-year maturity and a 4.500% fixed coupon;
- A $650 million bond, with 20-year maturity and a 4.875% fixed coupon;
- A $1.3 billion bond, with 30-year maturity and a 5.000% fixed coupon.

In addition, on 25 September 2018 EDF launched a €1 billion senior note offering, with 12-year maturity and a 2% fixed coupon.

These transactions enable the EDF group to further reinforce the structure of its balance sheet, and to refinance upcoming financial obligations.

3.5 ISSUANCE OF PERPETUAL SURBORDINATED BONDS

On 25 September 2018, EDF successfully launched a €1.25 billion "reset perpetual 6 year non-call hybrid note" with a 4% coupon and a first redemption at EDF's call between 4 July 2024 and 4 October 2024 inclusive. The French market regulator issued approval no. 18-466 dated 2 October 2018 for the prospectus concerning these instruments, for which settlement and delivery took place on 4 October 2018.

EDF remains committed to using hybrid bonds as a permanent part of its capital structure, to fund assets under construction.

In compliance with IAS 32, this issuance of perpetual subordinated bonds (see note 1.3.20.4) was recorded in equity upon receipt of the funds, at the amount of €1,243 million net of expenses.

3.6 REDEMPTION OF CERTAIN SERIES OF HYBRID BONDS

On 25 September 2018 EDF issued a cash tender offer for redemption of four outstanding series of hybrid bonds.

Following the end of the tender offer period on 3 October 2018, EDF proceeded to the cash redemption of bonds validly tendered from the first two hybrid issues, according to the order of priority, for an amount of €1.25 billion.

The total value of EDF's hybrid bonds remains unchanged as a result of the above hybrid bond issue and redemption transactions.

The results of the tender offer are summarised in the table below:

Targeted hybrid bonds	ISIN	Acceptance Priority Levels	Tendered Amounts	Tendered Amounts (as % of outstanding)	Acceptance Amounts	Pro-Rating Factors	Tender Prices
2020 bonds	FR0011401736	1	€911,800,000	73%	€911,800,000	100.00%	105.255%
2022 bonds	FR0011697010	2	€635,100,000	64%	€338,200,000	59.50%	108.185%
2026 bonds	FR0011401728	3	N/A	N/A	0	N/A	N/A
2025 bonds	FR0011401751	4	N/A	N/A	0	N/A	N/A

The settlement of the tender offer took place on 5 October 2018.

In compliance with IAS 32, this redemption of perpetual subordinated bonds (see note 1.3.20.4) was recorded in equity upon disbursement of the funds, at the amount of €1,329 million net of expenses.

3.7 SYNDICATION OF AN INNOVATIVE ESG-INDEXED REVOLVING CREDIT FACILITY

On 14 December 2018 EDF completed the syndication of a €4 billion revolving credit facility (see note 38.2.5), the cost of which is indexed on three of the Group's key performance indicators (KPIs) for environmental, social and governance (ESG) matters: EDF's direct CO_2 emissions, EDF's customers' use of its online consumption monitoring tools (as an indicator of EDF's success in getting French residential customers actively engaged with their consumption), and the electrification of EDF's vehicle fleet.

This ESG-indexed credit facility, which involves a syndicate of more than 20 banks, amends EDF's existing €4 billion revolving credit facility, extending it to a new maturity in 2023. It complements the set of sustainable financing tools that EDF has been developing over the last few years, particularly in the Green Bond market.

3.8 EDF RENEWABLES

3.8.1 EDF Renewables invests in New Jersey for development of offshore wind power projects

EDF Renewables North America and Shell New Energies US LLC (Shell) announced on 20 December 2018 that they had formed a 50/50 joint venture, Atlantic Shores Offshore Wind, LLC, to co-develop the OCS-0499 lease area within the New Jersey Wind Energy Area (WEA).

The lease area holds the potential to produce approximately 2,500MW of offshore wind energy – enough to cover the annual energy consumption of close to one million homes. This operation requires regulatory approvals, and construction is subject to a positive final investment decision.

The lease area comprises 74,200 hectares and lies about 13 kilometres off the coast of Atlantic City on the US Outer Continental Shelf (OCS). The area offers strong and steady wind resources in relatively shallow water, close to large population centres with high electricity demand.

The maritime lease was purchased as part of this project, for a price of up to €199 million (EDF's share).

3.8.2 A new partner for EDF Renewables in twenty-four UK wind farms

On 29 June 2018, EDF Renewables sold a 49% minority stake in twenty-four of its UK wind farms (around 550MW), for the price of £701 million.

The new partnership with Dalmore Capital Limited and Pensions Infrastructure Platform, with investments from large UK local authority pension schemes, will enable EDF Renewables to continue to expand the renewable energy business.

EDF Renewables retained a 51% share in this portfolio of wind farms. It will also continue to run the sites and to provide operations and maintenance and asset management services.

EDF Energy will also continue to purchase all of the electricity and ROCs (Renewables Obligation Certificates) generated by the wind farms, on market-standard terms.

The sale of this investment, which was considered as a transaction between shareholders with no change of control, is recognised in equity and has no impact on the Group's income statement (see the statement of Change in consolidated equity).

3.9 CONFIRMATION OF THE EUROPEAN COMMISSION DECISION ON THE TAX TREATMENT OF PROVISIONS ESTABLISHED BETWEEN 1987 AND 1996 FOR RENEWAL OF GENERAL NETWORK FACILITIES

On 16 January 2018, the General Court of the European Union rejected EDF's appeal against the European Commission's decision of 22 July 2015 classifying the tax treatment of provisions established between 1987 and 1996 for renewal of General Network facilities as state aid, and ordering that it be recovered by the French State. Following that decision by the Commission, on 13 October 2015 EDF had repaid €1.383 billion, corresponding to the amount of state aid including interest. Enedis and RTE contributed their respective shares.

In its ruling, the General Court upheld the European Commission's decision of 22 July 2015. In view of the repayment made on 13 October 2015, the execution of this ruling did not entail any additional payment.

On 27 March 2018, EDF submitted an appeal to the Court of Justice of the European Union against the General Court's ruling of 16 January 2018. On 13 December 2018 the Court rejected this appeal, confirming the European Commission's decision. This litigation is now definitively closed.

3.10 FLAMANVILLE 3 EPR PROJECT

Major milestones were reached during 2018:

- Completion of cold functional testing, consisting of a large number of test operations including the leak performance test on the primary system at a pressure greater than 240 bar – higher than the pressure of this system once in operation;
- Successful testing of the reactor containment building in April 2018. This is an in-air test that checks the concrete structure's mechanical behaviour and airtightness by raising pressure inside the building to six times the outside air pressure;
- Integration of an instrumentation and control (I&C) configuration involving around 250 modifications, completed in early September 2018, so that hot functional testing can take place in a stable, coherent I&C configuration.

Equipment manufacturing and quality

At 31 December 2018, almost all the equipment for the nuclear section and the conventional island, had been delivered and assembled on site. The situation as regards the quality of equipment manufactured by Framatome for the primary system is described in the following paragraphs.

Vessel

The issue of the higher-than expected carbon content in the vessel head and bottom was examined by the French Nuclear Safety Authority ASN *(Agence de Sécurité Nucléaire)* during the first half of 2017 on the basis of documentation submitted by Framatome under the supervision of EDF. Based on the opinion of a group of ASN-appointed experts, the ASN issued an opinion on 11 October 2017 concluding that the mechanical properties of the vessel head and bottom head were adequate for their uses, including in the event of an accident.

On 9 October 2018, the ASN authorised:

- the commissioning of the vessel bottom, subject to functional checks;

- the commissioning of the vessel head, for a limited operating life until 2024 unless the technical feasibility of checks comparable to the vessel bottom checks can be demonstrated.

EDF is currently working on development of in-service vessel head checks, in order to go back to the ASN later in 2019 for permission to retain the current vessel head if such checks are industrially feasible. If permission is not given, EDF could remain liable for some or all of the costs incurred to manufacture a replacement vessel head. These costs are not included in the target construction cost, since if they arise they would do so after the plant's commissioning. EDF SA has initiated arbitration proceedings against Areva SA on this matter.

Break preclusion and quality deviations in the welds of the main secondary system

On 30 November 2017, EDF declared a significant event to the ASN regarding the detection of a quality deviation in the welding of the secondary system that conducts the steam from the steam generators to the turbine of the Flamanville 3 EPR.

This system (main steam lines) was designed and manufactured according to the "break preclusion" concept, with stricter requirements for design, manufacture and in-service monitoring. These stricter requirements, requested by EDF, are backed up by a "high quality" requirement for the building of these systems.

Although these requirements were applied during the design phase, they were not properly incorporated into the welding work. Failure to meet these requirements does not necessarily entail non-compliance with the nuclear pressure equipment regulations.

From 21 March 2018, during an initial comprehensive inspection, EDF detected other quality deviations in welds on the pipes in the main secondary system of the Flamanville 3 EPR. The initial comprehensive inspection is a mandatory by law before commissioning plant, and mainly involves examination of the welds on the primary and secondary systems. It gives rise to an initial benchmark report on the state of plant before it begins operation.

In accordance with industrial procedures, the welds had been checked by the consortium of contractors in charge of manufacturing the system and each one had been declared compliant as the work was done.

On 10 April 2018 (see EDF's press release of the same date), EDF notified the ASN of a significant event relating to the detection of deviations in the performance checks on these welds (part of the main secondary system was already concerned by the insufficient application of the "break preclusion" requirements).

EDF therefore began a further inspection during the second quarter of 2018 of all 150 welds concerned in the main secondary system. Of these 150 welds:

- 87 welds were compliant with requirements;
- 33 welds had quality deficiencies and had to be repaired. The work on site to repair these welds began in late July 2018;
- EDF also decided to rework a further 20 welds which, although they had no defects, did not meet the break preclusion requirements defined by EDF during the EPR design phase. The files for adjustments to the first welds was sent to the ASN, and on-site welding work began in November 2018;
- for 10 other welds, EDF submitted a proposal to the ASN detailing a specific justification method to confirm the high level of safety at the plant throughout its operating life. After a final analysis this number was reduced to 8. It also became clear from checks that one of these eight welds had a small quality defect. The ASN will closely examine EDF's specific justification method in the next few months.

Commissioning schedule and construction costs

On 25 July 2018 (see EDF's press release of the same date), the Group presented an update concerning these inspections, and adjusted the Flamanville EPR schedule and target construction costs.

- The target date for loading the nuclear fuel was scheduled for the end of the fourth quarter of 2019, with start-up and hot functional testing planned for late 2018;
- The target construction costs were revised from €10.5 billion to €10.9 billion (in 2015 euros, excluding borrowing costs).

On 21 January 2019 (see EDF's press release of the same date) EDF announced that the schedule for hot functional testing had been revised, and it is now expected to commence during the second half of February 2019.

The schedule and estimated construction costs remain tight. They include a timetable for receiving authorisations from the ASN as explained above, which among other factors is contingent on the ASN completing its examination of the methods proposed by EDF for repairing the welds in the main secondary system, as stated in the Group's press release of 31 January 2019.

On 29 January 2019 the Chairman of the ASN announced that the ASN will issue a statement in May 2019 concerning the validation programme for the welds in the main secondary system, saying "if it turns out that the eight welds in the reactor containment building structure also need reworking then it will not be possible to meet the deadline." A detailed update on progress on the Flamanville EPR, particularly the schedule and construction cost, will be issued after the ASN's statement has been published. EDF is not currently in a position to assess the impact in the event the ASN does not validate the proposed approach.

3.11 SIGNIFICANT EVENTS AND TRANSACTIONS OF 2017

3.11.1 Capital increase by EDF SA

On 30 March 2017, EDF undertook a cash capital increase with preferential subscription rights for existing shareholders.

The total gross amount of the increase (including the issue premium) was €4,018 million, and 632,741,004 new shares were issued at the unit issue price of €6.35. This total amount comprised:

- a €316 million increase in the share capital;
- a €3,702 million gross increase in the issue premium.

Issue expenses (net of taxes) were charged to the issue premium.

In accordance with its commitment, the French State subscribed for an amount of €3 billion or approximately 75% of the capital increase, and after this operation held 83.10% of the Company's share capital.

3.11.2 Acquisition of 75.5% of Framatome

On 22 December 2017 AREVA SA, AREVA NP and EDF completed the sale to EDF of an interest conferring exclusive control over New NP (renamed Framatome since January 2018), a 100% subsidiary of AREVA NP.

EDF's acquisition of 75.5% of Framatome's capital was based on an adjusted valuation of €2.47 billion (for 100% of the capital), with no transfer of financial debt. This price was equivalent to a forecast 2017 EBITDA multiple of 8x [(1)].

In application of IFRS 3 (revised), the Group finalised recognition of the business combination in its accounts at 31 December 2018 (see note 5.1).

The purchase price at that date is set at €2.6 billion (for 100% of the capital), €132 million more than the initial estimation due to:

- Price adjustments based on the final accounts at the completion date of the transaction (31 December 2017);
- Estimated earn-out payments, some of them contingent on achievement of performance targets measured after completion of the purchase: the final amount of up to €245 million should be established during 2019;
- Estimation of certain guarantees granted to EDF by Areva NP in the sale agreement of 22 December 2017.

Framatome's provisional opening balance sheet at 31 December 2017 for 100% of the capital is presented in note 3.2.4.1 to the consolidated financial statements at 31 December 2017, and the final opening balance sheet is shown in note 5.1.

(1) Normalised pro forma EBITDA for the activities acquired, excluding large projects.

On 3 February 2018, Teollisuuden Voima (TVO) filed an appeal before the General Court of the European Union against the European Commission's decision of 29 May 2017 that authorised EDF's purchase of Framatome under antitrust regulations. TVO later withdrew its appeal and the Court announcement of 16 May 2018 removing the case from its register was made public at the end of May.

3.11.3 Sale of 49.9% of CTE

On 31 March 2017, EDF finalised the sale to Caisse des Dépôts and CNP Assurances of a 49.9% stake in the electricity transmission entity *Coentreprise de transport d'électricité* (CTE), which has held 100% of RTE since December 2016.

The sale was based on a valuation of €8.2 billion for 100% of RTE.

It had an impact of €1,462 million in 2017 on other income and expenses (€1,289 million on consolidated net income), and contributed to a decrease of approximately €4 billion in the EDF group's net indebtedness, based on a sale price of €1.3 billion for the portion not allocated to dedicated assets and a net reduction of €2.8 billion in net indebtedness due to loss of control over CTE.

Since this operation, EDF's 50.1% investment in CTE, stated at historic value, has been accounted for under the equity method and is entirely allocated to dedicated assets.

NOTE 4 REGULATORY CHANGES IN FRANCE

4.1 FRANCE'S MULTI-YEAR ENERGY PROGRAMME (PPE)

On 25 January 2019, France's Ministry for the Ecological and Inclusive Transition issued the draft PPE, the oversight tool for the energy policy introduced by the French law on the energy transition for green growth adopted in 2015. In principle, the PPE covers two successive five-year periods. The first PPE published in October 2016 departed from this rule by setting out two successive periods of three and five years respectively, 2016-2018 and 2019-2023. The revised PPE, which is not yet finalised, will cover the periods 2019-2023 and 2024-2028. This draft PPE follows the Ministry's press release of 27 November 2018 presenting the government's targets for the multi-year programme and the national low-carbon strategy.

For nuclear electricity generation, the French government has now set the deadline of 2035 for reaching the objective of a 50% nuclear share in the national electricity mix. This objective will consequently be modified in the Energy Code. To achieve it, 14 nuclear reactors would have to be shut down by 2035, including the closure of the two reactors at Fessenheim "by spring 2020, in application of the cap on installed electronuclear power, so that the Flamanville EPR can be put into operation".

The schedule for these shutdowns would be aligned with the timing of the fifth 10-year inspections of the reactors concerned, except for 2 reactors scheduled for closure during the second period of the PPE, in 2027 and 2028, provided the criterion of secure supply is respected. If certain conditions relating to electricity prices and European electricity market trends are fulfilled, two additional reactors could also be shut down in 2025-2026 by a decision to be made in 2023.

The final version of the PPE will name the priority sites for these reactor shutdowns. All of the closures would be associated with State support for the regions concerned, mainly through an ecological transition contract to foster new local development dynamics.

The draft PPE is currently undergoing a consultation process before it can be adopted and translated into laws or regulations in 2019.

If the measures described above are confirmed in the final laws and regulations, the principal consequence of their adoption for the Group's financial statements will be recognition of the change in the expected shutdown date of two nuclear reactors to 2027 and 2028, ahead of their fifth 10-year inspection: this will have an impact on the value of nuclear provisions at the time of the change of estimate, and prospective modification of the depreciation period for the two units concerned. As this situation would bring forward the shutdown of two reactors in the Group's fleet by a few years, the various scenarios examined indicate that the potential effect on nuclear provisions, particularly the decommissioning provision, could be an increase of some tens of millions of euros, via an adjustment to the relevant balance sheet assets.

The French government is to propose the terms of a new system of regulations for existing nuclear plants that will protect consumers against rising market prices after 2025 by allowing them to benefit from the competitive advantage of investments made in the historical nuclear power plant fleet, while giving EDF the financial capacity to ensure economic sustainability of generation facilities and meet the requirements of the PPE in low-price scenarios.

The draft PPE also states that "the Government, together with the industry, will conduct a programme of work by mid-2021 to examine the questions of the cost of new nuclear energy production and its advantages and disadvantages in relation to other low-carbon generation methods, the possible financing models, the project management modalities for new reactor projects and public consultation, and matters relating to the management of waste generated by the potential new nuclear fleet. Based on this information and depending on developments in the energy situation, the Government will make a decision regarding the suitability of launching a renewal programme for nuclear installations".

For fossil-fired electricity generation, under the draft PPE the last coal-fired plants would be closed down by 2022, and no further authorisations would be issued for new electricity plants that use fossil fuels.

If these measures are confirmed in the final laws and regulations, the principal consequence of their adoption for the Group's financial statements will be recognition of the prospective modification of the depreciation period for the coal-fired plants operated by the Group in France, at Le Havre and Cordemais (an increase of some €200 million in the annual depreciation expense over the period 2019-2022). The Group is, however, examining the possibilities of converting these plants to biomass plants. At the end of a meeting held on 24 January 2019, EDF and the Ministry for the Ecological and Inclusive Transition approved a programme of work leading up to a decision on the Ecocombust project.

As announced in EDF's press release of 29 January 2019, between now and autumn 2019, this programme of work should help validate the technical trials, environmental impact studies and economic model for this conversion project. After that period, if the technical, economic and environmental conclusions are satisfactory, once discussions have been held with the Government and local communities, EDF will embark on the industrialisation stage, aiming to start producing the fuel in 2022. The Ecocombust project concerns the production of an innovative, ecological fuel that can be used to run heating or electricity generation facilities that currently run on coal. To ensure secure electricity supplies in the north-west quarter of France, especially Brittany, some or all of the biomass produced could be used to provide 80% of the fuel for current reactors until 2026 if the studies by RTE commissioned by the government confirm the need, to ensure the electricity network in the west of France is secure at the highest peak consumption times.

The draft PPE also sets the objective of a significant step-up in the pace of development of renewable energies.

4.2 REGULATED ELECTRICITY SALES TARIFFS IN FRANCE – "BLUE" TARIFFS

Council of State decision of 18 May 2018

Legal challenges against the tariff decisions of 2016 and 2017 were brought before France's Council of State by Anode (the national association of retail energy operators) and Engie, on the grounds that the "blue" regulated electricity sales tariffs for residential and non-residential customers were contrary to European Union law.

Ruling on these challenges, by decisions of 18 May and 3 October 2018 the Council of State validated the principle of regulated electricity sales tariffs, notably acknowledging that they serve the public economic interest objective of guaranteeing consumers an electricity price that is more stable than market prices. The Council of State confirmed that this objective cannot be achieved by softer State intervention and that regulation of sales tariffs guarantees electricity firms equal access to consumers and is not discriminatory.

However, the Council of State considered that the tariff regulation is disproportionate in its duration, which is permanent, and its scope of application, which currently covers large business sites with subscribed power levels below 36kVA. These facts were cited as justification for partial cancellation of the tariff decisions of 28 July 2016 and 27 July 2017.

Implementation of these decisions is the responsibility of the lawmaker, which is currently preparing the necessary legislative measures through France's future "Pacte Law" for business growth.

Tariff changes

Since 8 December 2015, in accordance with the NOME Law on organisation of the French electricity market (articles L. 337-4 and L. 337-13 of the French Energy Code), the French Energy Regulatory Commission (*Commission de Régulation de l'Énergie* or CRE) has been responsible for sending the Ministers for the Economy and Energy its reasoned proposals for regulated sales tariffs for electricity. If no objections are made within three months, the proposals are deemed to have been approved.

For the tariff changes of 2018, the CRE, in accordance with the NOME Law on organisation of the French electricity market, issued a decision on 11 January 2018 proposing that the Government should raise the "blue" regulated tariffs for residential customers by +0.7% and for non-residential customers by +1.6%. This proposal was confirmed by a tariff decision of 31 January 2018 published in the *Journal officiel* of 1 February 2018, and implemented at that date.

The tariff change of summer 2018 followed the same process. Considering the TURPE adjustment of 1 August 2018 and in application of the French Energy Code, in a decision of 12 July 2018 the CRE proposed a -0.5% reduction in the "blue" regulated tariffs for residential customers and a +1.1% increase in the "blue" tariffs for non-residential customers.

The same CRE decision, citing the Council of State's decision of 18 May 2018, included the phasing out of "blue" tariffs for non-residential customers for all large business sites, suggesting a definition for determining the scope of large businesses based on "decree 2008-1354 of 18 December 2008 on the criteria that will determine the category to which a business belongs for the purposes of economic and statistical analysis".

All items of the CRE's proposal were approved in a tariff decision of 27 July 2018, published in the *Journal officiel* of 31 July 2018 and implemented on 1 August 2018.

In a decision of 7 February 2019 published on 12 February 2019, the CRE proposed an increase of 7.7% (excluding taxes) in the "blue" regulated tariffs for residential customers and non-residential customers. The date of application is as yet unknown. The government has three months to make an objection to this decision.

4.3 "TURPE" NETWORK ACCESS TARIFFS

On 17 November 2016, the CRE published its decisions for the TURPE 5 Transmission (high voltage) and TURPE 5 Distribution (medium voltage and low voltage) tariffs for the period 2017-2020. The new TURPE 5 tariff frame took effect on 1 August 2017.

TURPE 5 Transmission tariffs

The TURPE 5 Transmission tariff came into force with a 6.76% tariff increase effective from 1 August 2017, to be followed by subsequent rises on 1 August in the years 2018 to 2020, based on average inflation observed over the previous calendar year, adjusted by a correcting factor to balance the income and expenses adjustment account (CRCP)[1]. The TURPE 5 Transmission tariff sets the weighted average cost of capital (WACC) at 6.125% for the return on RTE's asset base versus 7.25% for TURPE 4.

On 17 May 2018 the CRE adopted a decision concerning the TURPE 5 tariff for the high voltage network and its revision at 1 August 2018. The tariff scale increased by an average +3% on 1 August 2018, comprising +1% for inflation and +2% to balance the CRCP.

TURPE 5 and TURPE 5 bis Distribution tariffs

TURPE 5

The TURPE 5 Distribution tariff came into force with a 2.71% tariff increase, which took effect on 1 August 2017, to be followed by subsequent rises on 1 August in the years 2018 to 2020, based on average inflation observed over the previous calendar year, adjusted by a correcting factor to balance the CRCP. The TURPE 5 continues to use the previous method for calculating cost of capital, setting the margin on assets at 2.6% and the return on regulated equity at 4.1%.

(1) A mechanism to measure and offset differences between the actual figures and the forecasts on which tariffs are based.

Action against the TURPE 5 HTA/BT (medium/low voltage) tariffs

- By a decision of 12 January 2017 published in the *Journal officiel* of 17 January 2017; the French Minister for Energy, acting within the two-month response period, requested a new decision from the CRE as in her opinion the decision of 17 November 2016 had not taken national energy policy orientations into consideration. In a new decision of 19 January 2017, the CRE reiterated its initial decision of 17 November 2016. Both decisions were published in the Journal officiel of 28 January 2017.
- On 2 February 2017, Enedis filed an application before the Council of State for cancellation of these two CRE decisions.
- On 3 February 2017, EDF, in its capacity as the shareholder of Enedis, also filed an application before the Council of State for cancellation of the same CRE decisions.
- By a decision of 9 March 2018, the Council of State partly cancelled the TURPE 5 decisions since the regulator "did not, in determining the cost of capital invested, apply, in addition to the 'risk premium', the 'risk-free rate' to the assets corresponding to items funded, at the time of renewal of installations, by recovery of the remaining portion of the provisions established during the tariff period covered by the 'TURPE 2' tariffs, and the corresponding portion of the installations handed over by the concessionary authorities to the network operator during the same period".

Second TURPE 5 HTA/BT (medium/low voltage) tariffs

On 28 June 2018, the CRE adopted a decision regarding the TURPE 5 HTA-BT (medium voltage – low voltage) tariff and the change from 1 August 2018 to that tariff, known as the "second TURPE 5 HTA-BT". This decision included an adjustment of an average -0.21% to the TURPE 5 from 1 August 2018, following a combination of factors:

- Implementation of the Council of State's partial cancellation decision on 9 March 2018, and the concurrent application of a lower corporate income tax rate: these two effects almost totally offset each other over the period 2018-2020 (combined effect of +0.06%);
- The standard inflation-based adjustment at 1 August (+1%) and balancing of the CRCP (-1.27%);
- The -0.21% reduction is modulated according to the tariff structure: on average -1.16% for users of the medium voltage networks (HTA), -0.59% for low voltage networks (BT) above 36kVA, and +0.14% for low voltage networks (BT) below 36kVA.

This decision has no impact on the tariff preparation method, the operating expense trajectory, the principle of regulation for incentive purposes, or the regulations applicable to Linky meters. The change in the corporate income tax rate is equivalent to adjusting the return on regulated equity to 4% and the margin on assets to 2.5% (previously 4.1% and 2.6% respectively).

The decision also reiterates previous CRE decisions about expenses relating to customer management under a single contract (decision of 26 October 2017), via the management component, and collective auto consumption (decision of 7 June 2018), via the energy withdrawal component. It was published in the *Journal officiel* on 29 July 2018.

In particular, to implement the Council of State's decision of 9 March 2018, the CRE added back an annual amount of around €1.6 billion in 2018 (and will add back declining amounts until 2073) to regulated equity. The CRE considers that this will lead to Enedis receiving additional remuneration equivalent to €750 million expressed in the present value of pre-tax cash flows. This add-back to regulated equity results in remuneration of some €60 million per year in the first few years, on a basis that will reduce progressively until 2073 at a (nominal pre-tax) rate that may, under the present method, be revised by the CRE at each tariff period.

Supplier commissioning

After Law 2017-1839 of 30 December 2017 confirmed the CRE's competence for supplier commissioning, the CRE issued a new decision on 18 January 2018, published in the *Journal officiel* of 25 January 2018. This decision reiterated the principles adopted in its previous decision of 26 October 2017 regarding remuneration payable by distribution network operators to suppliers for their management of customers under a single contract.

The content of these decisions upholds the principle of identical commissions for all suppliers selling single-contract market-price offers. Only regulated electricity tariffs will give rise to slightly lower commissions (€4.50 instead of €6.80 per point of delivery until 1 August 2019), and this difference will be progressively reduced to zero by 1 August 2022.

For remuneration of past customer management charges (prior to 1 January 2018), the CRE's decision sets an amount it considers as a cap that can be passed on through the TURPE tariff.

However, Law 2017-1839 of 30 December 2017 introduced a measure intended to rule out the possibility of suppliers receiving remuneration from network managers for past customer management services.

On 23 December 2016, Engie brought an action against Enedis before the Paris Commercial Court claiming such remuneration. These legal proceedings are ongoing.

Electricity Equalisation Fund

On 22 March 2018, the CRE published its consultation on the levels of contribution due to the Electricity Equalisation Fund for EDF SEI and Électricité de Mayotte for the years 2018 to 2021. The annual average contribution to the Electricity Equalisation Fund for EDF SEI over this period, including the planned smart metering system, is €185 million.

The amended decisions setting the level of contributions to the Electricity Equalisation Fund for the years 2012 to 2015 were cancelled by the Council of State on 9 March 2018. Discussions are in progress concerning the parameters of the coefficients used to calculate the respective contributions or income of Enedis and the various local distribution companies. The authorities have not yet adopted amended decisions for that period, nor for the period 2016 to 2018.

The risk of a change to the contributions payable by Enedis and Electricité de Strasbourg for the period 2012-2018 has been taken into consideration in the financial statements at 31 December 2018, based on ongoing discussions with the authorities, without prejudice to the final level that will be set or the position the companies concerned will present to the authorities.

4.4 COMPENSATION FOR PUBLIC ENERGY SERVICE CHARGES (CSPE)

Legal and regulatory framework

The compensation mechanism for public energy service charges (*compensation des Charges de Service Public de l'Energie*) results from a reform introduced by France's amended finance law for 2015, published in the *Journal officiel* on 30 December 2015. Under the legislative and regulatory framework, the public energy service charges (electricity and gas) were to be compensated *via* two State budget items included in France's finance laws from 2016 onwards. The initial finance law for 2019 marks a continuation from 2018, defining the following charges for 2019:

- a special "Energy Transition" budget item of €7.3 billion, principally to compensate for the additional costs associated with all contracts obliging the operators to purchase renewable energies and biogas and the annual contribution to repayment of the accumulated shortfall in compensation due to EDF;
- a "Public Energy Service" item of €3.3 billion in the general budget to cover solidarity charges borne by gas and electricity suppliers, costs associated with purchase obligations excluding renewable energies (essentially cogeneration), and the cost of applying the standard national tariffs to zones that are not connected to France's mainland network. The interest on the accumulated shortfall to be repaid to EDF is also funded through the general budget.

Since 1 January 2018, the "basic necessity" rates for electricity and the "special solidarity" rates for gas have been replaced by an energy voucher system. The cost of this system is not borne by EDF, but has been budgeted by the State in the "Public Energy Service" programme. However, EDF will bear solidarity charges in 2019 for the national housing solidarity fund and services for vulnerable customers.

In 2019, this mechanism of compensation for public service charges is funded as follows:

- the costs linked to the energy transition, which correspond to the subsidy mechanisms for renewable energies, and the reimbursement of the past accumulated shortfall in compensation borne by EDF as measured at 31 December 2015, are registered in a special "energy transition" budget item created by the amended finance law for 2015. Law no. 2016-1917 of 29 December 2016 (the finance law for 2017) stipulated that the two sources of additional funding for this special budget item would be a portion of the domestic tax on coal, lignite and coke (TICC), and a portion of the domestic tax on energy products (TICPE). The finance law for 2019 replaces the percentages of the TICC and TICPE by a set amount, to avoid the uncertainties of forecast income from these taxes, and broadens the sources of funding for the

"Energy transition" budget item by including the proceeds of auctions of Guarantees of Origin as allowed by Article L. 314-14-1 of the Energy Code.

- other public service charges – excluding costs associated with the subsidy mechanisms for renewable energies (fuel poverty, tariff equalisation in zones that are not connected to France's mainland network, cogeneration, the budget for the energy ombudsman, etc.) are registered directly in the general budget.
- income generated by the domestic tax on the final consumption of electricity, now renamed the Contribution to Public Electricity Service (*Contribution au Service Public de l'Electricité* – CSPE) goes directly into the general budget. The CSPE tax is collected directly from final consumers of electricity in the form of an additional levy on the electricity sale price (and collected from electricity suppliers), or directly from electricity producers that produce electricity for their own uses.
- The level of the CSPE tax is the same in 2019 as in 2018 with the full rate set at €22.5/MWh, and eight reduced rates ranging from €12/MWh to €0.5/MWh depending on criteria of electro-intensiveness, business category and the risk of carbon leakage from installations (the risk of industries relocating to countries where greenhouse gas emissions are higher due to their electricity mix).

The costs associated with conclusion and management of purchase obligation contracts will be eligible for compensation in 2019, as they have been since 2017. This concerns an annual amount of around €45 million.

In addition to these measures, the amended French finance law for 2018 applied a downward adjustment to the amounts of compensation paid by the State for public service charges in 2018: these charges had decreased substantially due to a rise in 2018 electricity market prices between the initial forecast of July 2017 and the adjusted forecast of July 2018, and that decrease automatically narrowed the differential between the purchase obligation tariff payable to producers and the market price for electricity. For the same reason, in 2018 the State also lowered 2018 compensation for the difference between 2017 expenses as reforecast in July 2017 and actual 2017 expenses as determined in July 2018.

Public service charges borne by EDF

The amount of expenses (excluding the annual contribution to repayment and associated interest) to be compensated to EDF for 2018 is €6,554 million.

The amounts received in the year 2018 (excluding the annual contribution to repayment and associated interest) totalled €6,919 million (including €4,610 million for the dedicated "energy transition" budget account and €2,309 million for the general budget).

A repayment schedule for EDF's receivable corresponding to the accumulated shortfall in compensation, which amounted to €5,780 million at 31 December 2015, was set out in the ministerial decision of 13 May 2016, amended on 2 December 2016. Under this schedule the receivable will be fully repaid by 2020. On 22 December 2016 EDF securitised a portion of this receivable (€1.5 billion) through a State-approved "Dailly law" assignment. Consequently, since 1 January 2017 EDF has received 73.6% of payments made by the State in reimbursement of the receivable as set out in the repayment schedule. The remainder is paid directly to the assignees.

During 2018, the State paid EDF €1,217 million of the principal amount of the financial receivable, comprising €1,194 million relating to the 2018 repayment schedule and €23 million, paid on 2 January 2018, relating to the 2017 repayment schedule. The €1,194 million received corresponds to the amount due for 2018 under the repayment schedule. At 31 December 2018, EDF's share of the outstanding financial receivable amounted to €2,014 million.

Finally, in accordance with decree 2016-158 of 18 February 2016 concerning compensation for public energy service charges, on 12 July 2018 the CRE published its decision 2018-156 recording the public service charges for 2017 (€6,475 million) and providing a revised forecast of charges for 2018 (€6,940 million) and a forecast of charges for 2019 (€7,206 million).

4.5 FRENCH CAPACITY MECHANISM

The French capacity mechanism took effect on 1 January 2017. It was introduced by France's Energy Code to ensure secure national power supplies.

On 8 November 2016, the European Commission authorised France's proposed capacity mechanism subject to the country introducing 7-year certification contracts for new capacities, admitting foreign capacities, and taking measures to prevent any market manipulation.

Several auctions of capacity for 2018 were held on the European Power Exchange EPEX SPOT, in 2017 and 2018. The volumes traded amounted to 10.96GW in November 2017 for the price of €9.31/kW, 10.25GW in December 2017 for the price of €9.38/kW and 1.17GW in April 2018 for the price of €9.38/kW (the market reference price for 2018 was €9.34/kW).

Several auctions of capacity for 2019 were held on the European Power Exchange EPEX SPOT in 2017 and 2018. The volumes traded and the associated prices were as follows:

Auction date	Quantities in GW	Price in €/kW
December 2017	1.22	13.00
March 2018	1.24	18.50
April 2018	2.65	18.24
June 2018	4.99	18.50
September 2018	5.22	18.50
October 2018	5.48	16.77
December 2018	5.91	18.05

Following the auction of 13 December 2018, the last before the year of delivery, the reference price for 2019 is now known: it is €17.37/kW.

An over-the-counter market exists alongside these capacity auctions.

EDF has participated in these auctions since they began. All income from the auctions is recognised in full in sales of goods.

The capacity price is passed on through all EDF's customer contracts, whether the customers are on regulated sales tariff or market-price contracts, and also through other electricity suppliers' contracts.

4.6 ENERGY SAVINGS CERTIFICATES

Decree 2017-690 of 2 May 2017 issued by the French Ministry for the Environment, Energy and the Sea, published in the *Journal officiel* on 3 May 2017, set the obligation levels for the fourth period of energy savings obligations running from 1 January 2018 to 31 December 2020. The overall level of obligations for this three-year period was substantially increased by the decree: 1,200TWhc for the "standard" obligations and 400TWhc for the obligations that are intended to benefit households in situations of energy poverty, compared to 700TWhc and 150TWhc respectively for the previous period.

Energy sellers may fulfil their obligation in three ways: by supporting consumers in their energy efficiency operations, funding ministry-approved energy savings certificate schemes, and purchasing certificates from eligible actors. Any surplus "stock" of certificates gained in the previous period also counts towards fulfilment of the obligation. If there is a shortfall at the end of the period, obligated actors must pay the Treasury the fine of €15 per MWhc of shortfall laid down in Article L. 221-4 of the Energy Code, approximately twice the current cost of the standard obligation.

The EDF group achieved a substantially higher number of energy savings certificates in 2018 than in 2017, and will aim to increase it further in order to achieve the objective set by the State. However, given the significant increase in the level of the obligation, combined with the currently shallow market for energy savings certificates and doubts over that market's future liquidity, the Group is exposed to a risk of a shortfall in certificates for the fourth period of the scheme.

4.7 ARENH

ARENH applications for 2018 deliveries totalled 96.3TWh: 87.1TWh for supplies to final customers and 9.2TWh to compensate network operators for network losses.

These applications were made at a time when the ARENH price (which includes a capacity guarantee in its €42/MWh) was competitive in comparison to forward baseload prices for 2018 (from early September 2017).

For the ARENH applications of November 2018, total demand from alternative suppliers was above the legal maximum, at 132.98TWh excluding EDF subsidiaries, and EDF will deliver the maximum ARENH volume of 100TWh for supply to competitors' final customers in 2019. Subscriptions to cover network losses amounted to 20.4TWh.

In a decision no. 2018-222 of 25 October 2018, as required by the Energy Code the CRE set out the method for allocating ARENH volumes when applications exceed the legal maximum. This decision stipulated that if the ARENH was oversubscribed in November 2018, curtailment would only apply to new ARENH applications made in that session, and that EDF-controlled subsidiaries' excess applications would be fully curtailed (this does not apply to distributors). Finally, it stated that EDF-controlled subsidiaries could enter into contracts with the parent company replicating the ARENH system and the terms of supply, particularly the curtailment rate for alternative suppliers. This curtailment mechanism, when applied, makes reference to market prices more influential in determining regulated sales tariffs, and all other things being equal, also increases the price of the energy component.

NOTE 5 CHANGES IN THE SCOPE OF CONSOLIDATION

There was no significant change in the Group's scope of consolidation during 2018, apart from the sale of Dunkerque LNG (see note 3.3), and the operations presented below:

5.1 FRAMATOME – FINAL RECOGNITION OF THE BUSINESS COMBINATION

In application of IFRS 3 (revised), on 31 December 2018 the Group finalised its recognition of the business combination linked to the acquisition of Framatome on 31 December 2017.

As the final amount of certain purchase price adjustments will only be known after 31 December 2018, the Group has estimated the expected value of these items (see note 3.11.2) to finalise recognition of the business combination at 31 December 2018.

Any subsequent adjustments to the estimated fair value of the price will be included in profit and loss.

After fair value measurement of assets and liabilities, Framatome's final opening balance sheet at 31 December 2017, which is very similar to the provisional opening balance sheet shown in note 3.11.2, is as follows:

ASSETS

(in millions of euros)	Final opening values
Goodwill	-
Other intangible assets	1,272
Property, plant and equipment	1,096
Investments in associates and joint ventures	92
Financial assets	171
Deferred tax assets	132
Inventories	610
Trade receivables	4,422
Current tax assets	5
Other receivables	604
Cash and cash equivalents	-
TOTAL ASSETS	8,404

EQUITY AND LIABILITIES

(in millions of euros)	Final opening values
Capital	707
Consolidated reserves	147
Equity – Group share	**854**
Non-controlling interests	4
Total equity	**858**
Provisions	987
Financial liabilities	10
Deferred tax liabilities	172
Trade payables	455
Current tax liabilities	1
Other liabilities	5,921
TOTAL EQUITY AND LIABILITIES	8,404

This balance sheet for the Framatome subgroup is presented before elimination of positions with Group entities, which mainly concern trade receivables and other liabilities.

At 31 December 2018, the final purchase price was adjusted for the expected earn-out payment and purchase price adjustments.

The final goodwill recorded on the operation on 31 December 2018, under the partial goodwill method and based on a 75.5% ownership percentage, is determined as follows:

(in millions of euros)	
Purchase price for the investment	1,960
Consideration transferred at 31 December 2018 (A)	**1,960**
Fair value of the Framatome assets acquired	645
Fair value of assets acquired and liabilities assumed (B)	**645**
FINAL GOODWILL (A)-(B)	1,315

5.2 ACQUISITION OF A 450MW OFFSHORE WIND PROJECT IN SCOTLAND

The EDF Group, via EDF Renewables in the United Kingdom, a joint subsidiary of EDF Energy and EDF Renewables, has bought the Neart na Gaoithe (1) wind farm project from global wind and solar developer Mainstream Renewable Power, following a competitive bidding process.

This wind farm will generate up to 450 megawatts (MW) of renewable energy, enough to meet the annual electricity requirements of more than 375,000 homes (2).

Neart na Gaoithe is a fully consented offshore wind project located in the Firth of Forth off the east coast of Scotland. It covers 105km^2, and has a 15-year Contract for Difference at €140 per MWh (resulting from indexation of the tariff of £114.39 per MWh set in 2012), and grid connection agreements in place. It also benefits from one of the best wind regimes in Europe. The commissioning of the wind farm is planned for 2023.

The total investment required to deliver the project is around £1.8 billion. The project will be open to other investors in due course.

5.3 ACQUISITION BY EDISON OF EDISON ENERGIE (FORMERLY GAS NATURAL VENDITA ITALIA)

Following approval from the European Union, Edison finalised its acquisition of Edison Energie (formerly Gas Natural Vendita Italia (GNVI)) on 22 February 2018 and strengthened its position in the domestic market, increasing its customer base by 50% and expanding its presence throughout Italy. Edison Energie's portfolio is located primarily in Southern Italy and the majority consists of gas customers. With this transaction, Edison has strengthened its position as a key national energy operator in the retail sector. The price paid to acquire the company was €193 million (see note 44.1.2.2 to the consolidated financial statements at 31 December 2017), and the goodwill recognised on this acquisition amounts to €80 million.

Completion of the acquisition of Edison Energie paves the way for transfer to Edison of a contract for gas supplies from the Shah Deniz II field in Azerbaijan.

NOTE 6 SEGMENT REPORTING

6.1 REPORTING BY OPERATING SEGMENT

Segment reporting presentation complies with IFRS 8, "Operating segments".

Segment reporting is presented before inter-segment eliminations. Inter-segment transactions take place at market prices.

In accordance with IFRS 8, the breakdown used by the EDF group corresponds to the operating segments as regularly reviewed by the Management Committee (the Group's chief operating decision-maker).

In 2018, the Group modified its segment reporting and now presents EDF Renewables and Dalkia separately (they were previously included in the "Other activities" segment).

The Group uses the following segments:

- "**France – Generation and Supply**": EDF's energy production and sales activities, commodity trading, and other activities;
- "**France – Regulated activities**": distribution, transmission, EDF's island activities and the activities of Electricité de Strasbourg;
- "**Framatome**": the entities of the Framatome subgroup;
- "**United Kingdom**": the entities of the EDF Energy subgroup;

(1) Neart na Gaoithe is Gaelic for "Strength of the Wind".
(2) Based on the average domestic electricity consumption per home of 3,889kWh per the Energy Consumption in the UK report (published in July 2017) and the average load factor for Renewable-UK offshore wind farms estimated at 37.2%.

- "**Italy**": Edison entities and TdE SpA;
- "**Other international**": EDF International and the other gas and electricity entities located in continental Europe, the US, Latin America and Asia;
- "**EDF** Renewables ": the entities of the EDF Renewables (formerly EDF Energies Nouvelles) subgroup;
- "**Dalkia**" : the entities of the Dalkia subgroup;
- **"Other activities"**: comprising in particular EDF Trading and EDF Investissements Groupe.

No segments have been merged.

6.1.1 At 31 December 2018

(in millions of euros)	France – Generation and Supply	France – Regulated activities	Framatome	United Kingdom	Italy	Other international	EDF Renewables (1)	Dalkia	Other activities	Inter-segment eliminations	**Total**
Income statements:											
External sales	24,937	16,007	1,904	8,965	8,477	2,227	1,089	3,633	1,737	-	68,976
Inter-segment sales	1,159	41	1,409	5	30	184	416	556	864	(4,664)	-
TOTAL SALES	**26,096**	**16,048**	**3,313**	**8,970**	**8,507**	**2,411**	**1,505**	**4,189**	**2,601**	**(4,664)**	**68,976**
OPERATING PROFIT BEFORE DEPRECIATION AND AMORTISATION	**6,327**	**4,916**	**465**	**783**	**791**	**240**	**856**	**292**	**858**	**(263)**	**15,265**
OPERATING PROFIT	**2,963**	**1,914**	**240**	**(397)**	**(127)**	**(10)**	**316**	**72**	**574**	**(263)**	**5,282**
Balance sheet:											
Goodwill	53	223	1,317	7,578	108	20	206	548	142	-	**10,195**
Intangible assets and property, plant and equipment	53,219	60,802	2,392	15,467	6,197	2,119	8,856	2,283	689	-	**152,024**
Investments in associates and joint ventures (2)	2,394	-	87	79	73	4,053	1,307	29	265	-	**8,287**
Other segment assets (3)	19,313	3,583	1,965	4,604	2,541	647	824	1,909	3,893	-	**39,279**
Assets classified as held for sale	-	-	-	-	-	-	-	-	-	-	**-**
Other non-allocated assets	-	-	-	-	-	-	-	-	-	-	**73,384**
TOTAL ASSETS	**74,979**	**64,608**	**5,761**	**27,728**	**8,919**	**6,839**	**11,193**	**4,769**	**4,989**	**-**	**283,169**
Other information:											
Net depreciation and amortisation	(3,307)	(2,942)	(211)	(982)	(574)	(249)	(437)	(205)	(99)	-	**(9,006)**
Impairment	(2)	-	(12)	(163)	(314)	-	(103)	-	(4)	-	**(598)**
Equity (non-controlling interests)	109	42	194	5,425	336	401	848	304	518	-	**8,177**
Investments in intangible assets and property, plant and equipment	5,526	4,334	261	2,983	447	216	1,919	388	112	-	**16,186**

(1) Formerly EDF Energies Nouvelles.
(2) At 31 December 2018, investments in associates and joint ventures include 50.1% of the interests in CTE (the joint venture holding RTE's shares) which is part of the France – Generation and Supply segment.
(3) Other segment assets include inventories, trade receivables and other receivables. By convention, the CSPE receivable is totally allocated to the France-Regulated Activities segment, in the amount of €799 million.

6.1.2 At 31 December 2017

The segment reporting at 31 December 2017 has been restated in accordance with the changes in operating segments introduced for the consolidated financial statements at 31 December 2018 and the provisions of IFRS 15 (see note 2.1.4).

(in millions of euros)	France – Generation and Supply	France – Regulated activities	Framatome [1]	United Kingdom	Italy	Other international	EDF Renewables	Dalkia	Other activities	Inter-segment eliminations	**Total**
Income statements:											
External sales	24,011	15,773	-	8,681	7,700	2,993	971	3,271	1,492	-	64,892
Inter-segment sales	1,073	63	-	7	22	173	309	480	983	(3,110)	-
TOTAL SALES	**25,084**	**15,836**	**-**	**8,688**	**7,722**	**3,166**	**1,280**	**3,751**	**2,475**	**(3,110)**	**64,892**
OPERATING PROFIT BEFORE DEPRECIATION AND AMORTISATION	**4,896**	**4,898**	**-**	**1,035**	**910**	**457**	**751**	**259**	**536**	**-**	**13,742**
OPERATING PROFIT	**3,048**	**2,035**	**-**	**(296)**	**(96)**	**314**	**361**	**13**	**258**	**-**	**5,637**
Balance sheet:											
Goodwill	53	223	1,257	7,586	18	15	206	537	141	-	10,036
Intangible assets and property, plant and equipment	50,433	59,008	2,336	14,074	6,396	2,155	8,230	2,128	2,103	-	146,863
Investments in associates and joint ventures [2]	2,040	-	92	114	67	3,812	903	34	187	-	7,249
Other segment assets [3]	20,165	3,784	1,694	4,306	2,405	628	578	1,737	5,072	-	40,369
Assets classified as held for sale	-	-	-	-	-	-	-	-	-	-	-
Other non-allocated assets	-	-	-	-	-	-	-	-	-	-	67,325
TOTAL ASSETS	**72,691**	**63,015**	**5,379**	**26,080**	**8,886**	**6,610**	**9,917**	**4,436**	**7,503**	**-**	**271,842**
Other information:											
Net depreciation and amortisation	(3,138)	(2,797)	-	(1,097)	(603)	(246)	(361)	(187)	(108)	-	(8,537)
Impairment	(73)	-	-	(246)	(150)	(19)	(29)	(1)	-	-	(518)
Equity (non-controlling interests)	-	39	209	5,109	370	407	113	155	940	-	7,342
Investments in intangible assets and property, plant and equipment	5,839	4,003	-	2,408	457	325	1,190	392	133	-	14,747

(1) The Framatome group was acquired on 31 December 2017.
(2) At 31 December 2017, investments in associates and joint ventures included RTE in the France – Generation and Supply segment.
(3) Other segment assets include inventories, trade receivables and other receivables. By convention, the CSPE receivable is totally allocated to the France-Regulated Activities segment, in the amount of €1,147 million.

6.2 SALES TO EXTERNAL CUSTOMERS, BY PRODUCT AND SERVICE GROUP

The Group's sales are broken down by product and service group as follows:

- **"Generation/Supply":** energy generation and energy sales to industry, local authorities, small businesses and residential consumers. This segment also includes commodity trading activities;
- **"Distribution":** management of the low and medium-voltage public electricity distribution networks;
- **"Other":** services and production of equipment and fuel for reactors, energy services (district heating, thermal energy services, etc.) for industry and local authorities, and new businesses mainly aimed at boosting electricity generation through cogeneration and renewable energy sources (e.g. wind turbines, photovoltaic panels, etc.).

(in millions of euros)	Generation - Supply	Distribution	Other [1]	**Total**
2018 :				
External sales :				
- France [2]	25,217	15,555	172	40,944
- International and Other activities	21,392	-	6,640	28,032
SALES	**46,609**	**15,555**	**6,812**	**68,976**

(in millions of euros)	Generation - Supply	Distribution	Other	**Total**
2017 :				
External sales :				
- France [2]	24,327	15,292	165	39,784
- International and Other activities	20,326	-	4,782	25,108
SALES	**44,653**	**15,292**	**4,947**	**64,892**

(1) "Other" groups of services include Framatome, which was acquired on 31 December 2017 (see note 3.11.2).
(2) "France" comprises the two operating segments "France – Generation and Supply" and "France – Regulated activities" (see note 6.1).

NOTE 7 SALES

Sales are comprised of:

(in millions of euros)	2018	2017 restated [1]
Sales of energy and energy-related services	63,713	62,102
Other sales of goods and services	4,387	2,186
Trading	876	604
SALES	68,976	64,892

(1) The comparative figures at 31 December 2017 have been restated according to IFRS 15 (see note 2.1).

After elimination of changes in foreign exchange rates and the scope of consolidation, sales in 2018 increase by 4% or €2.6 billion, principally in the France – Generation and Supply segment (+3.9% or +€0.9 billion), and Italy (+6.1% or +€0.5 billion), and in general across all segments (adjusted contribution figures).

The rise in sales in the France – Generation and Supply segment in 2018 mainly reflects (i) higher net resales on the purchase obligation markets (neutral effect on the operating profit before depreciation and amortisation with the CSPE), largely due to a substantial volume effect, (ii) favourable price effects on market-price offers, (iii) and the higher energy savings certificate component of offers, in relation with the increase in the obligation cost. The marked increase in nuclear generation in 2018 (+14.1TWh) compared to 2017, which was adversely affected by several reactor outages, and the increase in hydropower generation (+9.2TWh net), essentially reduced the Group's net buyer position (in euros) on the markets compared to 2017. These factors are favourable for the operating profit before depreciation and amortisation but are not reflected in the change in sales between 2017 and 2018, as the Group was in a net buyer position (in euros) in both years.

In Italy, sales increased due to a favourable volume movement on the business customer segment, and higher hydropower production following better hydrological conditions and very positive price effects on gas and exploration-production activities, driven by favourable changes in Brent and gas prices.

The effect on other sales of goods and services of the first consolidation of Framatome, which was acquired at 31 December 2017, amounted to €1,904 million.

NOTE 8 FUEL AND ENERGY PURCHASES

Fuel and energy purchases comprise:

(in millions of euros)	2018	2017 restated [1]
Fuel purchases used – power generation	(12,337)	(12,167)
Energy purchases	(13,351)	(13,816)
Transmission and delivery expenses	(7,724)	(7,441)
Gain/loss on hedge accounting	(18)	80
(Increase)/decrease in provisions related to nuclear fuels and energy purchases	418	443
FUEL AND ENERGY PURCHASES	(33,012)	(32,901)

(1) The comparative figures at 31 December 2017 have been restated according to IFRS 15 (see note 2.1).

Fuel purchases used include costs relating to raw materials for energy generation (coal, biomass, oil, propane, fissile materials, nuclear fuels and gas), purchases of services related to the nuclear fuel cycle, and costs associated with environmental schemes (mainly greenhouse gas emission rights and renewable energy certificates).

Energy purchases include energy generated by third parties, incorporating energy derived from cogeneration intended for resale.

NOTE 9 OTHER EXTERNAL EXPENSES

Other external expenses comprise:

(in millions of euros)	2018	2017
External services	(13,189)	(11,678)
Other purchases (excluding external services, fuel and energy)	(3,504)	(2,706)
Change in inventories and capitalised production	7,139	5,485
(Increase)/decrease in provisions on other external expenses	190	160
OTHER EXTERNAL EXPENSES	(9,364)	(8,739)

After elimination of changes in foreign exchange rates and the scope of consolidation (mainly concerning Framatome in 2018), other external expenses are stable compared to 2017.

NOTE 10 PERSONNEL EXPENSES

10.1 PERSONNEL EXPENSES

Personnel expenses comprise:

(in millions of euros)	2018	2017
Wages and salaries	(8,776)	(7,790)
Social contributions	(1,963)	(1,844)
Employee profit sharing	(278)	(223)
Other contributions related to personnel	(388)	(383)
Other expenses linked to short-term benefits	(233)	(212)
Short-term benefits	**(11,638)**	**(10,452)**
Expenses under defined-contribution plans	(1,033)	(938)
Expenses under defined-benefit plans	(1,017)	(994)
Post-employment benefits	**(2,050)**	**(1,932)**
Other long-term expenses	-	(83)
Termination payments	(2)	11
Other personnel expenses	**(2)**	**(72)**
PERSONNEL EXPENSES	(13,690)	(12,456)

Excluding foreign exchange effects and changes in the scope of consolidation (principally concerning Framatome in 2018), personnel expenses decreased by 0.6% from 2017, chiefly in the France – Generation and supply segment.

10.2 AVERAGE WORKFORCE

	2018	2017
IEG status	98,358	100,185
Other	63,850	50,888
AVERAGE WORKFORCE	162,208	151,073

The Group's average workforce for 2017 presented in the above table does not include the effect of acquisition of Framatome, due to the date of the acquisition (31 December 2017).

Average workforce numbers for the controlled entities and joint operations are reported on a full-time equivalent basis.

A more detailed presentation of workforce categories can be found in the "Environmental and Societal Information – Human Resources" section of the Reference Document in section 3.9.3.2.3, "Social indicators".

NOTE 11 TAXES OTHER THAN INCOME TAXES

Taxes other than income taxes break down as follows:

(in millions of euros)	2018	2017
Payroll taxes	(297)	(267)
Energy taxes	(1,561)	(1,518)
Other non-income taxes	(1,839)	(1,756)
TAXES OTHER THAN INCOME TAXES	(3,697)	(3,541)

Taxes other than income taxes mainly concern France and essentially comprise land tax and the French business taxes on land and value added.

NOTE 12 OTHER OPERATING INCOME AND EXPENSES

Other operating income and expenses comprise:

(in millions of euros)	Notes	2018	2017
Operating subsidies	12.1	6,846	6,823
Net income on deconsolidation	12.2	194	214
Gains on disposal of fixed assets	12.2	54	57
Net increase in provisions on current assets		73	42
Net increase in provisions for operating contingencies and losses		(132)	137
Other items	12.3	(983)	(786)
OTHER OPERATING INCOME AND EXPENSES		6,052	6,487

12.1 OPERATING SUBSIDIES

This item mainly comprises the subsidy received or receivable by EDF in respect of the CSPE, reflected in the financial statements through recognition of income of €6,554 million for 2018 (€6,547 million for 2017).

12.2 NET INCOME ON DECONSOLIDATION AND GAINS ON DISPOSAL OF FIXED ASSETS

In 2018, net income on deconsolidation and gains on disposal of property, plant and equipment mainly includes:

- gains on sales of EDF Renewables' generation assets as part of the Development and Sale of Structured Assets (DSSA) activities, amounting to €192 million (€180 million for 2017);
- gains on sales of real estate assets in France, amounting to €262 million (€307 million in France and Italy for 2017).

12.3 OTHER ITEMS

Other items principally comprise losses on non-recoverable operating receivables and costs associated with the Energy Savings Certificates used or consumed over the year. The unfavourable development in other items in 2018 is mainly explained by a rise in costs related to energy savings certificates.

NOTE 13 IMPAIRMENT/REVERSALS

13.1 IMPAIRMENT BY CATEGORY OF ASSET

Details of impairment recognised and reversed are as follows:

(in millions of euros)	Notes	2018	2017
Impairment of goodwill	18	-	-
Impairment of other intangible assets	19	(52)	(16)
Impairment of tangible assets and discontinued operations	21-22-43	(546)	(502)
IMPAIRMENT NET OF REVERSALS		(598)	(518)

In 2017, the €(518) million of impairment recorded concerned:

- thermal assets: €(188) million in the United Kingdom;
- some of Edison's exploration and production fields: €(150) million;
- other impairment on specific assets: €(131) million (notably concerning real estate assets in the United Kingdom and France, and hydropower projects in France);
- various CGUs of EDF Renewables (particularly a specialist battery company in the United States): €(29) million.

Impairment of €(618) million was also booked at 31 December 2017 in respect of associates (see note 23).

In 2018, impairment amounts to €(598) million. Details are given below.

13.2 IMPAIRMENT TESTS ON GOODWILL, INTANGIBLE ASSETS AND PROPERTY, PLANT AND EQUIPMENT

The following tables present the results of impairment tests carried out on the main goodwill, intangible assets with indefinite useful lives and other Group assets in 2018, and some of the key assumptions used.

As reported in note 3.11.2, the Group finalised allocation of the purchase price paid for 75.5% of the capital of Framatome on 31 December 2018. The assets acquired, mainly goodwill, intangible assets and property, plant and equipment, were recorded at fair value at the acquisition date of 31 December 2017.

The work done for the impairment tests applied at 31 December 2018 did not indicate that these amounts required adjustment.

Impairment of goodwill and intangible assets with indefinite useful lives

Operating segment	Cash-Generating Unit or asset	Net book value *(in millions of euros)*	WACC after tax	Growth rate to infinity	**Impairment 2018** *(in millions of euros)*
United Kingdom	EDF Energy goodwill British Energy brand	7,604 34	6.3%	-	- **(34)**
Italy	Edison brand	945	6.5%(distribution)– 8.9%(exploration-production)	2.0%	-
Dalkia	Dalkia goodwill Dalkia brand	550 130	4.4% 4.9%	1.7% 1.7%	- -
IMPAIRMENT OF GOODWILL AND INTANGIBLE ASSETS WITH INDEFINITE USEFUL LIVES					(34)

Impairment of other intangible assets and property, plant and equipment

Operating segment	Cash-Generating Unit or asset	Impairment indicators	WACC after tax	**Impairment 2018** *(in millions of euros)*
United Kingdom	CCGT	Fall in clean spark spread and temporary suspension of the capacity market mechanism	6.3%	(106)
	Coal-fired plants	Fall in clean dark spread and temporary suspension of the capacity market mechanism		(16)
Italy	E&P Edison assets	Decline in the long-term outlook for Brent oil prices, and production profiles for each field	6.9% – 10.4% depending on the country	(308)
EDF Renewables	EDF Renewables CGU		4.2% – 6.4%	(103)
Other impairment				(31)
IMPAIRMENT OF OTHER INTANGIBLE ASSETS AND PROPERTY, PLANT AND EQUIPMENT				(564)

General assumptions

Note 1.3.15 explains the methodology used by the Group for impairment testing.

The WACC in the benchmark countries was stable overall compared to 31 December 2017. In core Euro zone countries (especially France and Belgium), the effect of lower tax rates was offset by the slight downturn in risk-free rates and the country risk. In the United Kingdom and Italy, the WACC remained stable despite the impacts of tax reforms, and country risk premiums remain at the same level as 2017. Test results are subjected to analyses of sensitivity to the discount rate.

The market environment in 2018 was significantly better than in 2017, with a substantial rise in electricity market prices. Commodity prices rose in 2018, although at a slower pace in the second half of the year. CO_2 prices also registered a sharp rise, particularly under the influence of the Market Stability Reserve.

On the market horizon, forward prices were also markedly higher than the price levels used in the previous medium-term plan.

Over the long-term horizon, however, visibility of fundamentals was lower year-on-year, as the benchmark scenario incorporated more pronounced environmental objectives, notably European targets, which reduced demand for fossil fuels. The fuel and electricity price trajectories used in impairment testing are thus lower than last year in the core countries despite the impacts of the ETS (EU Emissions Trading System), with a larger downward adjustment in the United Kingdom due to a more cautious approach to the continued existence of the Carbon Price Support mechanism. As these assumptions are crucial in determining recoverable value, sensitivity analyses are applied to long-term price curves when impairment tests are undertaken.

In addition, the capacity mechanisms introduced under different approaches in different countries are still an uncertain channel for restoring sufficient income levels on certain generation assets. No capacity mechanism has yet been adopted in Italy, for example. In the United Kingdom, the Capacity Market was suspended on 18 November 2018 by a decision of the European Court of Justice ruling that it was incompatible with European rules on State aid. The impairment test applied assumes that a new system will be set up from the second half-year of 2019, in line with the British government's objective of holding further auctions in summer 2019 for deliveries in 2019/2020.

At 31 December 2018, the macro-economic context presented above does not introduce any major risk for the Group in addition to the risks already noted in previous years' financial statements; the impairment booked reflects risks specific to certain CGUs or specific assets.

United Kingdom – EDF Energy

British Energy brand

The British Energy brand is fully depreciated at 31 December 2018, as the prospects for its use are currently very limited.

Thermal assets

Significant amounts of impairment have been booked in recent years in respect of the Group's thermal assets in England, notably reducing the net book value of coal-fired plants and gas storage facilities practically to zero. Investments made in the Cottam and West Burton A coal-fired plants have been totally depreciated for an amount of €(16) million, consistent with the decisions of 2017 to close these plants early. On 7 February 2019 EDF Energy announced that it had decided to close the Cottam coal-fired plant.

At 31 December 2018, the temporary suspension of the British Capacity Market, and in the longer term, prospects of lower capacity prices and clean spark spreads than forecast at the end of 2017 led to the recognition of additional impairment on the West Burton B CCGT plant (€(106) million). The value of this asset is sensitive to price variations; a 5% variation in clean spark spreads would have an impact of approximately 5% on the recoverable value of the West Burton B CCGT plant.

Nuclear assets (plants in operation and the Hinkley Point C project) and goodwill

The recoverable value of existing nuclear assets (7 power plants) is estimated by discounting future cash flows over the assets' useful life, assuming a 20-year extension for the Sizewell B PWR plant (other, Advanced Gas-cooled Reactor (AGR) plants have already had their useful life extended by the British Nuclear Authority, the most recent decisions dating from February 2016). The level of production assumed for the test is coherent with the high nuclear plant availability of the past few years, although the level in 2018 was lower due to certain specific events. The recoverable value of EDF Energy's nuclear fleet has declined compared to 2017, mostly in line with long-term downward price trajectories, but is still higher than the assets' net book values. A 5% variation in electricity prices compared to the trajectory assumed for the test would have a 14% impact on the assets' recoverable value, without affecting the margin resulting from the test.

EDF Energy's goodwill amounted to €7.6 billion (or £6.7 billion) at 31 December 2018 and mainly resulted from the takeover of British Energy in 2009.

The recoverable value of EDF Energy is estimated by discounting future cash flows over the assets' expected useful life, taking into consideration the plan to construct two EPRs with a 60-year useful life at the Hinkley Point site, a project for which the final contracts were signed on 29 September 2016. Future cash flows relating to these plants are determined by reference to the Contract for Difference (CfD) between the Group and the UK government. The CfD sets stable, predictable prices for EDF Energy for a period of 35 years from the date the two EPRs are first commissioned: if market prices fall below the CfD exercise price, EDF Energy will receive an additional payment.

The 2018 impairment test, like the 2017 test, incorporates the latest estimates of revised project costs (see the press release of 3 July 2017) i.e. total project completion costs (excluding borrowing costs and exchange rate effects compared to the project's benchmark rate of £1=€1.23) of £19.6 billion (in 2015 sterling), £1.5 billion more than previous estimates, still assuming delivery of Unit 1 by the end of 2025. This estimate also assumes successful completion of operational action plans in partnership with suppliers. EDF's projected rate of return (IRR) is estimated at 8.5% (compared to about 9% initially).

Apart from the above information on medium and long-term price prospects, in 2018 the recoverable value of EDF Energy also reflects lower assumptions regarding downstream margins, in line with the introduction of the cap on the Standard Variable Tariff, and in the longer term, margin rates considered relatively small on the British market. On these bases, the difference between the recoverable value and the book value of EDF Energy remains significant at 31 December 2018.

For HPC, the project review also identified a risk of deferral of the Commercial Operation Date (COD), estimated at 15 months for Unit 1 and 9 months for Unit 2, entailing an additional potential cost of around £0.7 billion (in 2015 sterling) which would lead to an IRR for EDF of around 8.2%. This risk of deferral and the associated additional cost would reduce the margin resulting from the EDF Energy impairment test by approximately 20%.

Further sensitivity analyses were also conducted for information purposes, for example based on a 4-year deferral of commissioning and an associated additional cost of £4 billion over the new benchmark business plan. The results do not call into question the book value of EDF Energy.

Although the Brexit decision has no immediate impact on EDF Energy's impairment tests since most cash flows (receipts, costs, investments) and assets are stated in pounds sterling, it is still difficult at this stage to anticipate the long-term consequences, given the uncertainties over the timing and terms of the UK's departure from the European Union. The Group will monitor movements in the rates of return demanded by investors and changes in fuel prices, CO_2 prices and macro-economic data such as GDP growth, which could affect price curves.

Italy – Edison

As an intangible asset with an indefinite useful life, the Edison brand, first recognised at the value of €945 million when Edison was taken over in 2012, was subjected to an impairment test that did not identify any risk of impairment. This test used the royalty relief method. An external study of the brand value was also conducted and concluded that the brand's value in use is higher than its net book value.

At 31 December 2018, the recoverable value of certain "electricity" assets was improving due to a favourable short-term market environment (hydropower assets), and investments in high-return projects (wind power assets). The recoverable value of thermal assets, in contrast, declined due to slightly lower long-term forecasts concerning capacity prices and auxiliary services, but this did not affect the margin resulting from the test.

However, additional risks amounting to €(308) million were identified in 2018 concerning certain exploration-production fields, principally affected by a deterioration in long-term prospects for Brent oil prices, and in some cases by revision of production profiles.

Sensitivity analyses conducted as part of the impairment tests produced the following information:

- For "merchant" electricity generation assets, a 10% decrease in electricity prices or a 50 base point increase in the WACC would cause a maximum risk of around €(30) million, or less than 2% of the book value of these assets;
- For exploration and production assets, a 5% decrease in commodity prices would generate an additional risk of some €(60) million.

EDF Renewables

In 2018, impairment of €(103) million was recorded in respect of the various CGUs of EDF Renewables. It mainly concerns a wind farm and a biomass technology firm in the United States.

Dalkia

Dalkia's goodwill amounted to €550 million at 31 December 2018, and mainly resulted from acquisition of the Dalkia group in France under the agreement of 25 March 2014 with Veolia Environnement.

The recoverable value of the Dalkia group is based on future cash flows projected over a medium-term horizon, and a terminal value that represents cash flow projections to infinity. According to revised assumptions for 2018, the recoverable value remains higher than the book value. The key parameters of the test are the calculation method for the terminal value, and the discount rate: both were subjected to sensitivity analyses and the results did not affect the positive difference between the recoverable value and the book value.

The Dalkia brand, recognised as an asset when the Group took control of Dalkia in 2014 at the value of €130 million, is estimated by the royalties relief method. An updated test at 31 December 2018 showed that this book value is justified.

France – Generation and supply

The integrated management and interdependence of the different generation facilities that make up the French fleet (nuclear, thermal and hydropower plants), independently of their maximum technical capacities, have led the Group to consider the entire fleet as a single CGU. This CGU does not include any goodwill.

Even when there is no indication of any loss of value, an impairment test is performed due to the highly significant value of this CGU in the Group's financial statements and its substantial exposure to market prices since discontinuation of the "yellow" and "green" regulated tariffs on 1 January 2016.

The recoverable value of the generation fleet is estimated by discounting future cash flows under the Group's usual methodology, described in note 1.3.15, over the assets' useful life, using an after-tax WACC of 5.2% at 31 December 2018. For nuclear assets currently in operation (except for Fessenheim), the Group's basic valuation assumes that the useful life is extended to 50 years, in line with its industrial strategy. The nuclear capacity remains subject to a ceiling of 63.2GW in the test, consistent with France's Energy Transition Law.

The assumption of stable returns on capacity of €10/KW is adopted over a long-term horizon, in line with the analysis of system fundamentals used in the benchmark scenario. The average auction price achieved in 2018 was €18/KW.

The impairment test indicated a significant positive difference between the recoverable value and the book value of the generation fleet in France, supported by the rise in electricity prices on the market horizon and implementation of savings plans. The margin resulting from the test is down slightly from 31 December 2017, principally due to lower long-term price scenarios, and because in the short term the ARENH system cannot capture all the value associated with higher forward prices.

The key assumptions used in the test include the useful life of nuclear assets, the long-term price scenario, the discount rate, developments in costs and investments, and the assumed capacity premium. Each of these assumptions has been subjected to a sensitivity analysis, which does not call into question the existence of a positive difference between the recoverable value and book value. The test conducted at 31 December 2018 also took into consideration the sensitivity associated with the proposals for early closures of certain nuclear plants, as set out in the proposed multi-year energy programme. This did not affect the conclusions of the test.

Other International – Belgium

The impairment test applied to EDF Luminus did not indicate any risk of impairment. However, the margin resulting from the test is adversely affected by the Tihange 2 and 3 and Doel 3 and 4 nuclear assets, in which EDF Luminus owns a 10.2% share.

Finally, impairment of €(39) million was booked in respect of associates at 31 December 2018. Details are given in note 23.

NOTE 14 OTHER INCOME AND EXPENSES

Other income and expenses amount to €(105) million for 2018, mainly including a gain of €755 million on the sale of Dunkerque LNG and an allocation of €(737) million to provisions for onerous contract associated with the long-term contract with Dunkerque LNG, giving a net impact of €18 million (see note 3.3). Other income and expenses also include €(36) million of exceptional solidarity bonuses in France, and €(15) million resulting from the adjustment of EDF Energy's guaranteed minimum pension scheme (see note 3.3.1).

Other income and expenses amounted to €1,363 million for 2017, mainly including a gain of €1,462 million on the sale of 49.9% of the Group's investment in CTE.

NOTE 15 FINANCIAL RESULT

15.1 COST OF GROSS FINANCIAL INDEBTEDNESS

Details of the components of the cost of gross financial indebtedness are as follows:

(in millions of euros)	2018	2017
Interest expenses on financing operations	(1,769)	(1,869)
Change in the fair value of derivatives and hedges of liabilities	(93)	37
Transfer to income of changes in the fair value of cash flow hedges	102	31
Net foreign exchange gain on indebtedness	44	23
COST OF GROSS FINANCIAL INDEBTEDNESS	(1,716)	(1,778)

15.2 DISCOUNT EFFECT

The effect of unwinding the discount primarily concerns provisions for the back-end of the nuclear cycle, decommissioning and last cores, and long-term and post-employment employee benefits.

The increase in the discount effect at 31 December 2018 reflects a decrease in the real discount rate used for nuclear provisions in France that was more pronounced in 2018 than 2017 (see note 29.1)

Details of the final discount effect are as follows:

(in millions of euros)	2018	2017
Provisions for long-term and post-employment employee benefits	(875)	(884)
Provisions for the back-end of the nuclear cycle, decommissioning and last cores [(1)]	(2,480)	(1,968)
Other provisions and advances	(131)	(107)
DISCOUNT EFFECT	(3,486)	(2,959)

(1) Including the effect of discounting the receivable corresponding to amounts reimbursable by the NLF – see note 36.3.

15.3 OTHER FINANCIAL INCOME AND EXPENSES

Other financial income and expenses comprise:

(in millions of euros)	2018	2017
Financial income on cash and cash equivalents	13	21
Gains/(losses) on other financial assets (including loans and financial receivables)	254	295
Gains/(losses) on debt and equity securities	496	-
Changes in financial instruments carried at fair value through profit and loss	(995)	(102)
Gains/(losses) on available-for-sale financial assets	-	1,395
Other financial expenses	(261)	(52)
Foreign exchange gain/loss on financial items other than debts	(91)	(41)
Return on fund assets	475	470
Capitalised borrowing costs	502	515
OTHER FINANCIAL INCOME AND EXPENSES	393	2,501

In application of the simplified approach allowed by IFRS 9, the comparative figures for the first year of application have not been restated. Consequently, in 2018, "gains/(losses) on debt and equity securities" include dividends and interest income of €494 million on debt securities, and net gains of €2 million on sales (including €(12) million on dedicated assets).

In 2017, dividends and interest income on debt securities, and net gains (losses) on sales, were presented under "Gains/(losses) on available-for-sale financial assets" and amounted to €410 million.

Other financial income and expenses in 2018 include €(995) million of changes in fair value on financial instruments. In a context of market decline, particularly at the end of 2018, this unfavourable difference is explained by a €(1,026) million change in the fair value of debt and equity securities (of which €(989) million concern dedicated assets) and a €31 million change in the fair value of derivatives. In 2017, other changes in the fair value of financial instruments amounted to €(102) million including €(42) million relating to dedicated assets, and principally concerned derivatives held for trading.

Conversely, "Gains/(losses) on available-for-sale financial assets" in 2017 included net gains of €985 million on disposals (entirely attributable to dedicated assets).

NOTE 16 INCOME TAXES

16.1 BREAKDOWN OF TAX EXPENSE

Details are as follows:

(in millions of euros)	**2018**	2017
Current tax expense	(358)	42
Deferred taxes	507	(189)
TOTAL	149	(147)

In 2018, €(168) million of the current tax expense relates to French companies, and €(190) million relates to other subsidiaries (€314 million and €(272) million respectively in 2017).

16.2 RECONCILIATION OF THE THEORETICAL AND EFFECTIVE TAX EXPENSE (TAX PROOF)

(in millions of euros)	**2018**	2017
Income of consolidated companies before tax	**473**	**3,401**
Income tax rate applicable to the parent company	34.43%	34.43%
Theoretical tax expense	**(163)**	**(1,171)**
Differences in tax rate [1]	(90)	51
Permanent differences [2]	30	476
Taxes without basis [3]	239	478
Unrecognised deferred tax assets	132	20
Other	1	(1)
ACTUAL TAX EXPENSE	149	(147)
EFFECTIVE TAX RATE	-31.54%	4.32%

The income tax receivable of +€149 million in 2018, corresponding to an effective tax rate of -31.54% (compared to a charge of €(147) million in 2017, corresponding to an effective tax rate of 4.32%) essentially results from non-recurring items (disposals or impairment). After elimination of these non-recurring items, the effective current tax rate for 2018 is 25.70%, compared to 18% in 2017.

The main factors explaining the difference between the theoretical tax rate and this effective rate are:

- 2018:
  - [2] the favourable impact of sales of investments and assets subject to a reduced tax rate, amounting to €199 million (principally Dunkerque LNG - see note 3.3);

- [3] the impact of deduction of payments made to bearers of perpetual subordinated bonds, amounting to €203 million.

- 2017:
  - [1] the positive impacts of income tax cuts in Belgium (from 33.99% to 25% in 2020) and the United States (from 40% to 27%), amounting to €38 million and €46 million respectively;
  - [2] the favourable impact of sales of investments (principally the CTE/RTE operation) and assets subject to a reduced tax rate, amounting to €389 million.
  - [3] the favourable impact of the appeal concerning the 3% contribution on dividend distributions, amounting to €255 million (and non-taxable) and the impact of deduction of payments made to bearers of perpetual subordinated loans, amounting to €195 million.

16.3 CHANGE IN DEFERRED TAX ASSETS AND LIABILITIES

(in millions of euros)	**2018**	2017
Deferred tax assets	1,220	1,641
Deferred tax liabilities	(2,362)	(2,272)
Net deferred taxes at 1 January	**(1,142)**	**(631)**
Change in net income	508	(189)
Change in equity	(354)	(437)
Translation adjustments	23	61
Changes in scope of consolidation	(28)	22
Other movements	(16)	32
NET DEFERRED TAXES AT 31 DECEMBER	(1,009)	(1,142)
Deferred tax assets	978	1,220
Deferred tax liabilities	(1,987)	(2,362)

€(309) million of the change in 2018 in deferred tax assets included in equity results from actuarial gains and losses on post-employment benefits (€(349) million in 2017).

16.4 BREAKDOWN OF DEFERRED TAX ASSETS AND LIABILITIES BY NATURE

(in millions of euros)	**31/12/2018**	31/12/2017
Deferred taxes:		
Fixed assets	(5,627)	(5,419)
Provisions for employee benefits	4,493	5,203
Other provisions and impairment	557	378
Financial instruments	172	163
Tax loss carryforwards and unused tax credits	1,448	1,289
Other	187	132
Total deferred tax assets and liabilities	**1,230**	**1,746**
Unrecognised deferred tax assets	(2,239)	(2,888)
NET DEFERRED TAXES	(1,009)	(1,142)

At 31 December 2018, unrecognised deferred tax assets represent a potential tax saving of €2,239 million (€2,888 million at 31 December 2017), mainly relating to France and the United States.

In France, this potential tax saving, which amounts to €1,449 million at 31 December 2018 (€2,043 million at 31 December 2017), essentially concerns deferred tax assets on employee benefits. These deferred tax assets have no expiry date.

In the United States, this potential tax saving amounts to €485 million (€499 million in 2017) and relates to negative taxable earnings generating losses which can be carried forward until dates between 2029 and 2039.

Recognised deferred tax assets on tax loss carryforwards amount to €662 million (€497 million in 2017) and principally concern the United States (€230 million in 2018, €199 million in 2017), France (€214 million in 2018, €51 million in 2017), Canada and Belgium. They have been recognised due to the existence of deferred tax liabilities on the same tax entities that will reverse over the same time horizon, or because there are prospects of taxable profits.

NOTE 17 BASIC EARNINGS PER SHARE AND DILUTED EARNINGS PER SHARE

The diluted earnings per share is calculated by dividing the Group's share of net income, corrected for dilutive instruments and the payments made during the year to bearers of perpetual subordinated bonds, by the weighted average number of potential shares outstanding over the period after elimination of treasury shares.

The following table shows the reconciliation of the basic and diluted earnings used to calculate earnings per share (basic and diluted), and the variation in the weighted average number of shares used in calculating basic and diluted earnings per share:

(in millions of euros)	**2018**	2017
Net income attributable to ordinary shares	1,177	3,173
Payments on perpetual subordinated bonds	(584)	(565)
Effect of dilutive instruments	-	-
Net income used to calculated earnings per share	**593**	**2,608**
Average weighted number of ordinary shares outstanding during the year	**2,968,327,473**	**2,660,243,412**
Average weighted number of diluted shares outstanding during the year	**2,968,327,473**	**2,660,243,412**
Earnings per share (in euros):		
EARNINGS PER SHARE	0.20	0.98
DILUTED EARNINGS PER SHARE	0.20	0.98

In 2018, the payment of the outstanding scrip dividend for 2017 led to an increase in the share capital and an issue premium totalling €847 million, corresponding to the issuance of 82,828,872 shares.

NOTE 18 GOODWILL

18.1 CHANGES IN GOODWILL

Goodwill on consolidated entities comprises the following:

(in millions of euros)	31/12/2018	31/12/2017
Net book value at opening date	**10,036**	**8,923**
Acquisitions	116	1,396
Disposals	-	-
Impairment (note 13)	-	-
Translation adjustments	(61)	(282)
Other changes	104	(1)
NET BOOK VALUE AT CLOSING DATE	10,195	10,036
Gross value at closing date	10,960	10,802
Accumulated impairment at closing date	(765)	(766)

The changes in goodwill in 2018 primarily related to:

- the change in goodwill following finalisation of the business combination accounts for the acquisition of Framatome at 31 December 2017 (€58 million) (see notes 5.1 and 3.11.2);
- Edison's acquisition of Edison Energie (formerly GNVI) in Italy (€80 million) (see note 5.3) and Attiva (€13 million);
- translation adjustments of €(61) million, largely reflecting the pound sterling's decline against the Euro.

The changes in goodwill in 2017 primarily related to the acquisition of Framatome for €1,257 million, (see note 3.11.2) and the translation adjustments of €(282) million, largely reflecting the pound sterling's decline against the Euro.

18.2 GOODWILL BY OPERATING SEGMENT

The breakdown of goodwill between the new segments as presented in note 6.1 is as follows:

(in millions of euros)	31/12/2018	31/12/2017
France – Generation and supply	**53**	53
France – Regulated activities	**223**	223
Framatome [(1)]	**1,317**	1,257
United Kingdom (EDF Energy)	**7,578**	7,586
Italy	**108**	18
Other international	**20**	15
Dalkia	**548**	536
EDF Renewables	**206**	206
Other activities	**142**	142
GROUP TOTAL	10,195	10,036

(1) At 31 December 2018, €1,315 million results from the acquisition of Framatome (see note 5.1).

NOTE 19 OTHER INTANGIBLE ASSETS

The net value of other intangible assets breaks down as follows:

At 31 December 2018

(in millions of euros)	31/12/2017	Acquisitions	Disposals	Translation adjustments	Changes in scope	Other movements	31/12/2018
Software	**4,034**	774	(165)	(10)	24	7	4,664
Positive fair value of commodity contracts acquired in a business combination	**810**	-	-	-	-	(229)	581
Greenhouse gas emission rights – green certificates	**440**	1,144	(1,082)	(2)	-	1	501
Other intangible assets	**7,501**	1,023	(40)	(11)	214	33	8,720
Intangible assets in development [1]	**1,211**	32	(6)	1	-	(5)	1,233
Gross value	**13,996**	2,973	(1,293)	(22)	238	(193)	15,699
Accumulated amortisation and impairment	**(5,100)**	(1,109)	170	15	2	241	(5,781)
Net value	**8,896**	**1,864**	**(1,123)**	**(7)**	**240**	**48**	**9,918**

(1) Increases in intangible assets in development are presented net of the effect of commissioning new assets.

The gross value of other intangible assets at 31 December 2018 includes:

- the Edison brand and intangible assets related to Edison's hydropower concessions, amounting to €945 million and €729 million respectively;
- the Dalkia brand and intangible assets related to Dalkia's concession agreements in France, amounting to €130 million and €1,145 million respectively;
- the Framatome brand, Framatome's nuclear technology-related intangible assets and Framatome's customer contracts, amounting to €151 million, €777 million and €344 million respectively.

Intangible assets in development include studies currently in process for the EPR2 project, amounting to €296 million.

Impairment of €(52) million was recorded in respect of other intangible assets in 2018.

EDF's research and development expenses recorded in the income statement total €510 million for 2018.

At 31 December 2017

(in millions of euros)	31/12/2016	Acquisitions	Disposals	Translation adjustments	Changes in scope	Other movements	31/12/2017
Software	**3,624**	638	(224)	(37)	23	10	**4,034**
Positive fair value of commodity contracts acquired in a business combination	**810**	-	-	-	-	-	**810**
Greenhouse gas emission rights – green certificates	**428**	1,123	(1,107)	(7)	1	2	**440**
Other intangible assets	**5,975**	410	(113)	(46)	1,322	(47)	**7,501**
Intangible assets in development [1]	**995**	128	(2)	(6)	96	-	**1,211**
Gross value	**11,832**	**2,299**	**(1,446)**	**(96)**	**1,442**	**(35)**	**13,996**
Accumulated amortisation and impairment	**(4,382)**	(976)	272	58	(71)	(1)	**(5,100)**
NET VALUE	**7,450**	**1,323**	**(1,174)**	**(38)**	**1,371**	**(36)**	**8,896**

(1) Increases in intangible assets in development are presented net of the effect of commissioning new assets.

The gross value of other intangible assets at 31 December 2017 included:

- the Edison brand and intangible assets related to Edison's hydropower concessions, amounting to €945 million and €729 million respectively;
- the Dalkia brand and intangible assets related to Dalkia's concession agreements in France, amounting to €130 million and €962 million respectively;
- the Framatome brand, Framatome's nuclear technology-related intangible assets and Framatome's customer contracts, amounting to €132 million, €702 million and €402 million respectively.

Impairment of €(16) million was recorded in respect of other intangible assets in 2017.

EDF's research and development expenses recorded in the income statement totalled €546 million for 2017.

NOTE 20 PROPERTY, PLANT AND EQUIPMENT OPERATED UNDER FRENCH PUBLIC ELECTRICITY DISTRIBUTION CONCESSIONS

20.1 NET VALUE OF PROPERTY, PLANT AND EQUIPMENT OPERATED UNDER FRENCH PUBLIC ELECTRICITY DISTRIBUTION CONCESSIONS

(in millions of euros)	31/12/2018	31/12/2017
Property, plant and equipment	54,677	53,034
Property, plant and equipment in progress	1,838	1,705
PROPERTY, PLANT AND EQUIPMENT OPERATED UNDER FRENCH PUBLIC ELECTRICITY DISTRIBUTION CONCESSIONS	56,515	54,739

20.2 MOVEMENTS IN PROPERTY, PLANT AND EQUIPMENT OPERATED UNDER FRENCH PUBLIC ELECTRICITY DISTRIBUTION CONCESSIONS (EXCLUDING ASSETS IN PROGRESS)

(in millions of euros)	Land and buildings	Networks	Other installations, plant, machinery, equipment & other	Total
Gross value at 31/12/2017	**2,746**	**89,955**	**4,131**	**96,832**
Increases [1]	168	3,919	419	**4,506**
Decreases	(19)	(595)	(172)	**(786)**
Gross value at 31/12/2018	2,895	93,279	4,378	100,552
Depreciation and impairment at 31/12/2017	**(1,397)**	**(39,778)**	**(2,623)**	**(43,798)**
Net depreciation	(64)	(237)	(193)	**(494)**
Disposals	15	469	205	**689**
Other movements [2]	(12)	(2,148)	(112)	**(2,272)**
Depreciation and impairment at 31/12/2018	(1,458)	(41,694)	(2,723)	(45,875)
Net value at 31/12/2017	**1,349**	**50,177**	**1,508**	**53,034**
NET VALUE AT 31/12/2018	1,437	51,585	1,655	54,677

(1) Increases also include facilities provided by the concession grantors.
(2) Other movements mainly concern depreciation of assets operated under concessions, booked against amortization recorded in the special concession liability accounts.

NOTE 21 PROPERTY, PLANT AND EQUIPMENT OPERATED UNDER CONCESSIONS FOR OTHER ACTIVITIES

21.1 NET VALUE OF PROPERTY, PLANT AND EQUIPMENT OPERATED UNDER CONCESSIONS FOR OTHER ACTIVITIES

The net value of property, plant and equipment operated under concessions for other activities breaks down as follows:

(in millions of euros)	31/12/2018	31/12/2017
Property, plant and equipment	6,026	6,369
Property, plant and equipment in progress	1,313	1,238
PROPERTY, PLANT AND EQUIPMENT OPERATED UNDER CONCESSIONS FOR OTHER ACTIVITIES	7,339	7,607

21.2 MOVEMENTS IN PROPERTY, PLANT AND EQUIPMENT OPERATED UNDER CONCESSIONS FOR OTHER ACTIVITIES (EXCLUDING ASSETS IN PROGRESS)

(in millions of euros)	Land and buildings	Fossil-fired & hydropower plants	Networks	Other installations, plant, machinery, equipment & other	Total
Gross value at 31/12/2017	**1,489**	**12,566**	**39**	**582**	**14,676**
Increases	25	376	20	29	**450**
Decreases	(1)	(83)	(35)	(3)	**(122)**
Translation adjustments	-	17	-	-	**17**
Changes in the scope of consolidation	-	13	-	-	**13**
Other movements	(3)	13	-	1	**11**
Gross value at 31/12/2018	1,510	12,902	24	609	15,045
Depreciation and impairment at 31/12/2017	**(895)**	**(6,999)**	**(22)**	**(391)**	**(8,307)**
Net depreciation	(33)	(383)	(4)	(33)	**(453)**
Impairment net of reversals	-	(306)	-	-	**(306)**
Disposals	1	46	11	3	**61**
Translation adjustments	-	(11)	-	-	**(11)**
Changes in the scope of consolidation	-	-	-	-	**-**
Other movements	(2)	-	-	(1)	**(3)**
Depreciation and impairment at 31/12/2018	(929)	(7,653)	(15)	(422)	(9,019)
Net value at 31/12/2017	**594**	**5,567**	**17**	**191**	**6,369**
NET VALUE AT 31/12/2018	581	5,249	9	187	6,026

Property, plant and equipment operated under concessions for other activities comprise concession facilities mainly located in France (hydropower, excluding public electricity distribution) and Italy.

In 2018, impairment of property, plant and equipment in progress and other assets used in concessions for other activities amount to €(2) million and €(306) million respectively.

NOTE 22 PROPERTY, PLANT AND EQUIPMENT USED IN GENERATION AND OTHER TANGIBLE ASSETS OWNED BY THE GROUP

22.1 NET VALUE OF PROPERTY, PLANT AND EQUIPMENT USED IN GENERATION AND OTHER TANGIBLE ASSETS OWNED BY THE GROUP

The net value of property, plant and equipment used in generation and other tangible assets owned by the Group breaks down as follows:

(in millions of euros)	**31/12/2018**	31/12/2017
Property, plant and equipment	47,779	48,972
Property, plant and equipment in progress	30,377	26,515
Finance-leased property, plant and equipment	96	135
PROPERTY, PLANT AND EQUIPMENT USED IN GENERATION AND OTHER TANGIBLE ASSETS OWNED BY THE GROUP	78,252	75,622

At 31 December 2018, property, plant and equipment in progress owned by the Group mainly concerns the EPR reactors at Flamanville 3 (€12,479 million including capitalised borrowing costs of €2,622 million), Hinkley Point C (€7,502 million including capitalised borrowing costs of €108 million) and Sizewell (€133 million including capitalised borrowing costs of €1 million).

The capitalised value of the Flamanville 3 EPR project in the financial statements at 31 December 2018 is €10,065 million excluding borrowing costs (€9,874 million in property, plant and equipment in progress and €191 million [(1)] in property, plant and equipment in operation). This includes the following, in addition to the construction cost:

- an inventory of spare parts and capitalised amounts totalling €328 million for related projects (notably the initial comprehensive inspection and North Area development);
- €520 million of pre-operating expenses and other property, plant and equipment related to the Flamanville project;
- and also, since 1 January 2018, the elimination of internal balances on balance sheet items and margins between Framatome and EDF SA in connection with the Flamanville 3 EPR project (€437 million, essentially consisting of advances and progress payments),

giving a construction cost at historical value of €9,217 million in the financial statements at 31 December 2018, for target construction costs (excluding borrowing costs) announced on 25 July 2018 as €10.9 billion expressed in 2015 euros.

(1) €241 million gross, less €50 million of depreciation.

The changes observed in property, plant and equipment (including assets in progress) also include a foreign exchange effect of €(129) million, mainly caused by the decline of the pound sterling against the Euro.

In 2018, impairment recognised in respect of property, plant and equipment in progress and finance-leased, and other property, plant and equipment owned by the Group, amounts to €(19) million and €(219) million respectively.

22.2 MOVEMENTS IN PROPERTY, PLANT AND EQUIPMENT USED IN GENERATION AND OTHER TANGIBLE ASSETS OWNED BY THE GROUP (EXCLUDING ASSETS IN PROGRESS AND FINANCE-LEASED ASSETS)

(in millions of euros)	Land and buildings	Nuclear power plants	Fossil-fired & hydropower plants	Networks	Other installations, plant, machinery, equipment & other	Total
Gross value at 31/12/2017	**13,019**	**68,890**	**20,837**	**17**	**18,765**	**121,528**
Increases	610	3,336	187	-	1,857	**5,990**
Decreases	(403)	(1,074)	(225)	-	(543)	**(2,245)**
Translation adjustments	(8)	(89)	(9)	-	(23)	**(129)**
Changes in the scope of consolidation [(1)]	(233)	-	(1,367)	-	(755)	**(2,355)**
Other movements [(2)]	(17)	327	22	-	36	**368**
Gross value at 31/12/2018	**12,968**	**71,390**	**19,445**	**17**	**19,337**	**123,157**
Depreciation and impairment at 31/12/2017	**(7,074)**	**(45,679)**	**(12,230)**	**(12)**	**(7,561)**	**(72,556)**
Net depreciation	(331)	(2,804)	(581)	-	(1,246)	**(4,962)**
Impairment net of reversals	-	-	(154)	-	(65)	**(219)**
Disposals	208	984	220	-	501	**1,913**
Translation adjustments	1	45	12	-	3	**61**
Changes in the scope of consolidation [(1)]	12	-	71	1	57	**141**
Other movements	(7)	230	63	-	(42)	**244**
Depreciation and impairment at 31/12/2018	**(7,191)**	**(47,224)**	**(12,599)**	**(11)**	**(8,353)**	**(75,378)**
Net value at 31/12/2017	**5,945**	**23,211**	**8,607**	**5**	**11,204**	**48,972**
NET VALUE AT 31/12/2018	**5,777**	**24,166**	**6,846**	**6**	**10,984**	**47,779**

(1) Changes in the scope of consolidation mainly concern assets related to the sale of the Dunkerque methane terminal (see note 3.3).
(2) Other movements include the effect on assets associated with provisions and underlying assets of the €289 million change in the real discount rate used to calculate provisions related to EDF's nuclear generation (see note 29.1).

22.3 FINANCE LEASE CONTRACTS

	31/12/2018				31/12/2017
	Total	Maturity			Total
(in millions of euros)		< 1 year	1 –5 years	> 5 years	
Future minimum lease payments receivable as lessor	**24**	8	14	2	33
Future minimum lease payments payable as lessee	**405**	53	164	188	367

The Group is the lessor in agreements classified as finance leases under IFRIC 4 and IAS 17.

The Group is bound as lessee by irrevocable finance lease contracts for premises, equipment and vehicles used in the course of its business. The corresponding payments are subject to renegotiation at intervals defined in the contracts.

NOTE 23 INVESTMENTS IN ASSOCIATES AND JOINT VENTURES

Investments in associates and joint ventures are as follows:

		31/12/2018			31/12/2017	
(in millions of euros)	Principal activity [1]	Ownership%	Share of net equity	Share of net income	Share of net equity	Share of net income
Principal investments in associates						
CTE [2]	O	50.10	1,406	283	1,241	249
CENG	G	49.99	1,667	102	1,494	(316)
Taishan (TNPJVC) [3]	G	30.00	n.c	n.c.	1,122	(17)
Alpiq [4]	G, D, O, T	25.04	622	(41)	602	25
Other investments in associates and joint ventures			n.c.	n.c.	2,790	94
TOTAL			8,287	569	7,249	35

n.c. = not communicated

(1) G= generation, D= distribution, T = transmission, O = other.

(2) At 31 December 2018, this corresponds to a 50.1% interest in CTE (the joint venture holding RTE's shares – see note 3.11.3). In 2017, by convention, the share of net income presented comprises 100% of RTE's net income for the first quarter of 2017 and 50.1% of the CTE subgroup's net income for the rest of the year 2017.

(3) The financial data for Taishan at 31 December 2018 are not reported in this table as CGN (Taishan's parent company) publishes its consolidated financial statements later than the Group.

(4) As Alpiq publishes its consolidated financial statements after the Group, the figures above include an estimate for net income at 31 December 2018 (including the final results published by Alpiq in August 2018).

Other investments in associates and joint ventures principally concern Nam Theun Power Company (NTPC), Compagnie Énergétique de Sinop (CES), Jiangxi Datang International Fuzhou Power Generation Company Ltd and certain companies owned by EDF Renewables and EDF SA.

In 2018, €(39) million of impairment was booked in respect of investments in associates and joint ventures and a number of specific assets. This impairment is not detailed below due to its low materiality for the Group's financial statements.

In 2017, €(618) million of impairment of investments in associates and joint ventures was booked, mainly concerning the assets of CENG (see note 23.2.2).

23.1 COENTREPRISE DE TRANSPORT D'ÉLECTRICITÉ (CTE)

23.1.1 CTE – financial indicators

The key financial indicators for the CTE subgroup (on a 100% basis) are as follows:

(in millions of euros)	31/12/2018	31/12/2017 (1)
Non-current assets	17,740	17,163
Current assets	2,854	2,793
Total assets	**20,593**	**19,956**
Equity	2,807	2,476
Non-current liabilities	13,225	12,870
Current liabilities	4,561	4,610
Total equity and liabilities	**20,593**	**19,956**
Sales	4,817	3,143
Operating profit before depreciation and amortisation	2,058	1,285
Net income	566	337
Net indebtedness	11,799	11,633
Gains and losses recorded directly in equity	78	-
Dividends paid	313	159

(1) The figures at 30 June 2017 are the figures for the CTE subgroup (CTE is the joint venture that holds the shares in RTE), comprising 100% of RTE's net income for the first quarter of 2017 and 50.1% of the CTE subgroup's net income for the second quarter of 2017,due to the sale of CTE (see note 3.11.3).

CTE's affiliate, RTE (Réseau de Transport d'Électricité), is responsible for managing the high voltage and very high voltage public electricity transmission network. Enedis uses RTE's network to convey energy to the distribution network.

23.2 CENG

23.2.1 CENG – financial indicators

The key financial indicators for CENG (on a 100% basis) are as follows:

(in millions of euros)	31/12/2018	31/12/2017
Non-current assets	7,689	7,370
Current assets	1,142	965
Total assets	**8,831**	**8,335**
Equity	3,334	2,989
Non-current liabilities	4,912	5,030
Current liabilities	585	316
Total equity and liabilities	**8,831**	**8,335**
Sales	1,335	1,156
Operating profit before depreciation and amortisation	579	396
Net income [(1)]	205	(633)
Gains and losses recorded directly in equity	(123)	107
Dividends paid	-	-

(1) Including 100% of impairment at 31 December 2017, amounting to €(982) million.

23.2.2 Impairment

In 2017, impairment of €(491) million was recorded on the Group's investment in CENG as a result of lower forward prices and long-term electricity prices.

At 31 December 2018, the update of the impairment test for CENG assets indicated that the recoverable value of the investment was higher than the book value, mainly due to the new long-term price curves published by external organisations over the second half-year, and the effects of the tax reform. However, given the specific context of the asset explained below, there was no partial recovery of the impairment booked previously.

Calculation of the value in use is sensitive to several assumptions, particularly concerning the long-term existence of New York State's Zero Emission Credit (ZEC) programme of subsidies for nuclear power plants, which provides additional income for the Ginna and Nine Mile Point plants. This programme is currently the subject of legal proceedings and its continuation could be called into question.

In addition, there are uncertainties relating to several key assumptions for the valuation of the investment in CENG (e.g. the market environment, legal framework, changes in energy policies, and the Group's lack of control over strategy-setting). The calculation of recoverable value for the CENG asset thus includes a specific risk premium.

Under the terms of the agreement with Exelon, EDF has an option to sell its share in CENG to Exelon at fair value, exercisable between January 2016 and June 2022.

23.3 TAISHAN

23.3.1 Taishan – financial indicators

The key financial indicators published for Taishan (on a 100% basis) are as follows:

(in millions of euros)	31/12/2017	31/12/2016
Non-current assets	11,030	10,936
Current assets	350	66
Total assets	**11,380**	**11,002**
Equity	3,316	3,594
Non-current liabilities	6,864	6,563
Current liabilities	1,200	845
Total equity and liabilities	**11,380**	**11,002**
Sales	-	-
Net income	(56)	(39)
Dividends paid	-	-

23.3.2 Transactions between the EDF group and Taishan

EDF owns 30% of Taishan Nuclear Power Joint Venture Company Limited (TNPJVC), which was set up to build and operate two EPR nuclear reactors in Taishan, in the province of Guangdong in China. CGN holds a 51% stake and Yudean a 19% stake.

Framatome has two contracts with TNPJVC:

- supply of two EPR nuclear islands in a consortium with CNPDC and CNPEC;
- delivery of fuels (initial core and first refuelling for each unit).

The first reactor began commercial operation on 13 December 2018 (see note 3.1), and the second reactor is due to start commercial operation in 2019.

As the tariff preparation is currently in process, an impairment test will be applied once the tariff and the indexing system are known.

23.4 ALPIQ

As Alpiq publishes its consolidated financial statements after the Group, the figures presented here include an estimate for net income at 31 December 2018 (see note 4 to the table in note 23).

23.4.1 Published financial indicators

The main published indicators by the Alpiq group were as follows:

(in millions of euros)	31/12/2017	31/12/2016 restated [2]
Non-current assets	4,833	5,394
Current assets	2,858	3,921
Assets classified as held for sale	1,022	5
Total assets	**8,713**	**9,320**
Equity [1]	3,388	3,619
Non-current liabilities	2,554	3,235
Current liabilities	2,154	2,465
Liabilities related to assets classified as held for sale	617	1
Total equity and liabilities	**8,713**	**9,320**
Sales	6,444	5,576
Operating profit before depreciation and amortisation	250	714
Net income	(80)	270
Gains and losses recorded directly in equity	176	(24)
Dividends paid to the Group	-	-

(1) Including €869 million of hybrid bonds.
(2) The Alpiq group's balance sheet at 31 December 2016 has been restated to reflect presentation impacts and impacts of the change in classification of certain companies that were previously classified as assets held for sale and are now presented in the balance sheet.

On 25 April 2013, the main Swiss shareholders of Alpiq subscribed a hybrid loan of CHF 366.5 million. Following this first step, on 2 May 2013 Alpiq placed a public hybrid bond amounting to CHF 650 million, with 5% coupon and a redemption option after five and a half years at the earliest.

Due to their characteristics, in compliance with IAS 32, these hybrid loan and bond were recorded in equity in Alpiq's consolidated financial statements. Since the EDF group did not subscribe to the operation, there was no impact on the value of the investment in Alpiq reported in "Investments in associates and joint ventures".

The difference between the shares of equity as published by Alpiq and as reported in the Group's consolidated financial statements largely results from this hybrid loan.

The value of the EDF group's investment in Alpiq, valued on the basis of the stock market price at 31 December 2018, is €475 million.

23.4.2 Impairment

The Alpiq group is operating in a difficult market environment with notably low wholesale prices. Also, Alpiq has no access to final customers on the non-liberalised Swiss market. This unfavourable context has affected the profitability of its generation capacities in Switzerland and furthermore, due to price coverage strategies, Alpiq cannot take advantage in the short term of market price rises.

In March 2016 Alpiq announced that it was introducing structural measures in traditional energy generation, to reduce its exposure to wholesale prices with a view to selling some of its generation fleet. These measures did not produce the expected results and the group subsequently refocused on disposal of its energy service assets.

When it published its half-year 2018 financial statements on 24 August 2018, Alpiq once again mentioned the difficulties caused by Switzerland's asymmetrical electricity market regulations. As these risks had already been taken into consideration, no additional impairment was booked by Alpiq in those half-year financial statements.

On the strategic level, Alpiq successfully concluded the sale of its energy service activities to the French company Bouygues Construction in late July 2018. This operation enables Alpiq to refocus on its core businesses and improve its liquidities.

At the end of August 2018 EDF gave notice to terminate the consortium agreement that has existed between the entity's founding shareholders since 2015. The agreement will expire in September 2020.

The Group is not currently aware of any factor that has arisen since publication of Alpiq's half-year results to indicate a risk of further impairment on its investment at 31 December 2018. The Group will continue to closely monitor the effective implementation of Alpiq's action plans and changes in the market context and regulatory environment in Switzerland. Should the Alpiq group recognise impairment in its annual 2018 consolidated financial statements, due to be published on 4 March 2019, the EDF group would reflect that in its half-year 2019 financial statements.

NOTE 24 INVENTORIES

The carrying value of inventories, broken down by nature, is as follows:

	31/12/2018			31/12/2017		
(in millions of euros)	Gross value	Provision	Net value	Gross value	Provision	Net value
Nuclear fuel	10,671	(6)	10,665	10,831	(15)	10,816
Other fuel	957	(14)	943	906	(7)	899
Other raw materials	1,613	(302)	1,311	1,526	(283)	1,243
Work-in-progress for production of goods and services	538	(30)	508	494	(48)	446
Other inventories	840	(40)	800	768	(34)	734
TOTAL INVENTORIES	**14,619**	**(392)**	**14,227**	**14,525**	**(387)**	**14,138**

The more-than-one-year portion mainly concerns nuclear fuel inventories amounting to €7,810 million at 31 December 2018 (€7,932 million at 31 December 2017).

The value of EDF Trading's inventories stated at market value is €142 million at 31 December 2018 (€179 million at 31 December 2017).

NOTE 25 TRADE RECEIVABLES

Details of net trade receivables are as follows:

(in millions of euros)	31/12/2018	31/12/2017 restated
Trade receivables, gross value – excluding EDF Trading	14,468	14,359
Trade receivables, gross value – EDF Trading	2,446	3,530
Impairment	(1,004)	(1,046)
TRADE RECEIVABLES, NET VALUE	**15,910**	**16,843**

Most trade receivables mature within one year.

Advances received from customers in France who pay in regular monthly instalments, amounting to €6,827 million at 31 December 2018 (€6,568 million at 31 December 2017), are deducted from trade receivables (see note 2.1.3.2).

25.1 TRADE RECEIVABLES DUE AND NOT YET DUE

(in millions of euros)	31/12/2018			31/12/2017		
	Gross value	Provision	Net value	Gross value	Provision	Net value
TRADE RECEIVABLES	16,914	(1,004)	15,910	17,889	(1,046)	16,843
overdue by up to 6 months	1,318	(214)	1,104	1,172	(260)	912
overdue by 6-12 months	393	(152)	241	435	(137)	298
overdue by more than 12 months	877	(511)	366	890	(532)	358
Trade receivables due	**2,588**	**(877)**	**1,711**	**2,497**	**(929)**	**1,568**
Trade receivables not yet due	**14,326**	**(127)**	**14,199**	**15 392**	**(117)**	**15 275**

25.2 ASSIGNMENT OF RECEIVABLES

(in millions of euros)	31/12/2018	31/12/2017
Trade receivables assigned and wholly retained in the balance sheet	-	-
Trade receivables assigned and partly retained in the balance sheet	38	41
Trade receivables assigned and wholly derecognised	1,095	903

The Group assigned trade receivables for a total of €1,095 million at 31 December 2018, mainly concerning EDF SA, Edison and Dalkia (€903 million in December 2017).

As most assignment operations are carried out on a recurrent, without-recourse basis, the corresponding receivables are no longer carried in the Group's consolidated balance sheet.

25.3 CONTRACT ASSETS

Contract assets are rights held by an entity to receive a consideration in return for goods or services supplied to customers, when such rights are conditional on something other than the passage of time.

The contract assets included in receivables represent an amount of €225 million at 31 December 2017 and €439 million at 31 December 2018 and mainly concern the Framatome, Dalkia and EDF Renewables operating segments.

NOTE 26 OTHER RECEIVABLES

Details of other receivables are as follows:

(in millions of euros)	31/12/2018	31/12/2017restated [1]
Prepaid expenses	1,719	1,592
Compensation for Public Energy Service charges (CSPE)	799	1,147
VAT receivables	2,133	2,043
Other tax receivables	342	368
Other operating receivables	4,149	4,237
OTHER RECEIVABLES	9,142	9,387
Non-current portion	1,796	2,168
Current portion	7,346	7,219
Gross value	9,197	9,462
Impairment	(55)	(75)

(1) The published figures at 31 December 2017 have been restated according to IFRS 15 (note 2.1.3.2).

At 31 December 2018, other receivables include an amount of €799 million corresponding to the CSPE receivable (€1,147 million at 31 December 2017). The rest of the CSPE receivable is included in "Loans and financial receivables" (see note 36.3).

NOTE 27 EQUITY

27.1 SHARE CAPITAL

At 31 December 2018, EDF's share capital amounts to €1,505,133,838 comprising 3,010,267,676 fully subscribed and paid-up shares with nominal value of €0.50, owned 83.67% by the French State, 15.06% by the public (institutional and private investors) and 1.15% by current and retired Group employees, with 0.12% held by EDF as treasury shares.

In June 2018, payment of part of the balance of dividends for 2017 in the form of a scrip dividend led to a €41 million increase in the share capital and an issue premium of €806 million following issuance of 82,828,872 new shares. The legal formalities for this operation were finalised in June 2018.

Under Article L. 111-67 of the French Energy Code, the French State must hold more than 70% of the capital of EDF at all times.

27.2 TREASURY SHARES

A share repurchase programme authorised by the General Shareholders' Meeting of 9 June 2006 was implemented by the Board of Directors, within the limit of 10% of the total number of shares making up the Company's capital. The initial duration of the programme was 18 months, renewed for 12 months then by tacit agreement every year.

A liquidity contract exists for this programme, as required by the French market regulator AMF *(Autorité des marchés financiers)*.

At 31 December 2018, treasury shares deducted from consolidated equity represent 3,728,019 shares with total value of €56 million.

27.3 DIVIDENDS

The General Shareholders' Meeting of 15 May 2018 decided to distribute an ordinary dividend of €0.46 per share in respect of 2017, offering shareholders the choice of payment in cash or shares (scrip option).

In application of Article 24 of the Company's articles of association, shareholders who had held their shares continuously for at least 2 years at the year-end and still held them at the dividend distribution date benefit from a 10% bonus on their dividends. The number of shares carrying an entitlement to the bonus dividend cannot exceed 0.5% of the Company's capital per shareholder. The bonus dividend amounts to €0.506 per share.

As interim dividends of €0.15 per share had been paid in the form of new shares or cash on 11 December 2017, the balance payable for 2017 amounted to €0.31 per share benefiting from the ordinary dividend and €0.356 per share benefiting from the bonus dividend. The balance of the dividend was paid out on 19 June 2018.

The French government opted for the scrip dividend for the balance of 2017 dividends payable.

The amount of the cash dividend paid to shareholders who did not opt for the scrip dividend for 2017 amounts to €60 million.

On 6 November 2018, EDF's Board of Directors decided to distribute an interim dividend of €0.15 per share in respect of 2018. This interim dividend, amounting to a total of €451 million, was paid out entirely in cash on 10 December 2018.

27.4 EQUITY INSTRUMENTS

At 31 December 2018, perpetual subordinated bonds carried in equity amount to €10,101 million (less net-of-tax transaction costs).

On 25 September 2018 EDF issued new perpetual subordinated bonds amounting to a total €1.25 billion, with a 4% coupon. They may be redeemed at the initiative of EDF from 4 July 2024.

Also, on 3 October 2018, EDF proceeded to cash redemption of part of two outstanding series of hybrid bonds, for an amount of €1.25 billion.

Interest paid by EDF to the bearers of perpetual subordinated bonds issued in January 2013 and January 2014 totalled €584 million in 2018 and €565 million in 2017. The resulting cash payout is reflected in a corresponding reduction in Group equity.

In January 2019, EDF paid interest of around €334 million to the bearers of perpetual subordinated bonds.

Perpetual subordinated bonds in the accounts of EDF

(in millions of currencies)

Entity	Issue	Nominal amount	Currency	Redemption option	Coupon
EDF	01/2013	338	EUR	7 years	4.25%
EDF	01/2013	1,250	EUR	12 years	5.38%
EDF	01/2013	1,250	GBP	13 years	6.00%
EDF	01/2013	3,000	USD	10 years	5.25%
EDF	01/2014	1,500	USD	10 years	5.63%
EDF	01/2014	662	EUR	8 years	4.13%
EDF	01/2014	1,000	EUR	12 years	5.00%
EDF	01/2014	750	GBP	15 years	5.88%
EDF	10/2018	1,250	EUR	6 years	4.00%

27.5 NON-CONTROLLING INTERESTS (MINORITY INTERESTS)

27.5.1 Details of non-controlling interests

(in millions of euros)	31/12/2018			31/12/2017	
	Ownership%	Equity (non-controlling interests)	Net income attributable to non-controlling interests	Equity (non-controlling interests)	Net income attributable to non-controlling interests
Principal non-controlling interests:					
EDF Energy Nuclear Generation Ltd.	20.0%	2,612	(21)	2,687	23
NNB Holding Ltd.	33.5%	2,849	(3)	2,138	-
EDF Investissements Groupe SA	6.1%	516	11	516	11
EDF Luminus SA	31.4%	380	(21)	388	2
Framatome	24.5%	258	40	209	-
Other non-controlling interests	-	1,562	8	1,403	80
TOTAL	-	8,177	14	7,341	116

Non-controlling interests in EDF Energy Nuclear Generation Ltd. (formerly British Energy), which is owned 80% by the Group *via* EDF Energy, correspond to Centrica's share.

Non-controlling interests in NNB Holding Limited, the holding company for the Hinkley Point C project, which is owned 66.5% by the Group *via* EDF Energy, correspond to CGN's share.

Non-controlling interests in Framatome, the group which was acquired on 31 December 2017 (see note 3.11.2) and is owned 75.5% by the Group via EDF SA, correspond to the 19.5% share held by Mitsubishi Heavy Industries and the 5% share held by Assystem.

Non-controlling interests in EDF Luminus correspond to the investments held by Belgian local authorities.

Non-controlling interests in EDF Investissements Groupe correspond to the investment held by Natixis Belgique Investissements.

Other non-controlling interests in 2017 principally comprised the investments held by Total and Fluxys in Dunkerque LNG, and minority interests in Sizewell C Holding Co and subsidiaries of the Edison and EDF Renewables subgroups. In 2018 they mainly comprise minority interests in Sizewell C Holding Co and subsidiaries of the Edison and EDF Renewables subgroups.

Other non-controlling interests also include instruments in the form of bonds convertible into shares, issued by the Dalkia group and subscribed by minority interests, amounting to a total €260 million at 31 December 2018 (€124 million in 2017). The changes over the year are mainly explained by convertible bond issues totalling €157 million. These bonds qualify as equity instruments under IAS 32, and analysis of voting rights and corporate governance confirms the continuation of exclusive control by Dalkia. In the statement of cash flows, this operation is presented in cash flows from financing activities.

27.5.2 Non-controlling interests in EDF Energy

The key financial indicators (100% basis) for EDF Energy Nuclear Generation Ltd. are as follows:

(in millions of euros)	31/12/2018	31/12/2017
Non-current assets	21,304	21,149
Current assets	3,289	3,228
Total assets	**24,593**	**24,377**
Equity	13,061	13,433
Non-current liabilities	10,805	10,252
Current liabilities	727	692
Total equity and liabilities	**24,593**	**24,377**
Sales	2,765	3,070
Net income	(106)	135
Gains and losses recorded directly in equity	(100)	(220)
Net cash flow from operating activities	649	867
Net cash flow from investing activities	(555)	(514)
Net cash flow from financing activities	(113)	(328)
Cash and cash equivalents – opening balance	**483**	**468**
Net increase/(decrease) in cash and cash equivalents	(19)	25
Effect of currency fluctuations	1	(10)
Other	7	-
Cash and cash equivalents – closing balance	**472**	**483**
Dividends paid to shares of non-controlling interests	23	70

NOTE 28 PROVISIONS

The breakdown between current and non-current provisions is as follows:

		31/12/2018			31/12/2017		
(in millions of euros)	Notes	Current	Non-current	Total	Current	Non-current	Total
Provisions for the back-end of the nuclear cycle		1,515	22,362	23,877	1,479	21,378	**22,857**
Provisions for decommissioning and last cores		302	26,842	27,144	290	25,032	**25,322**
Provisions related to nuclear generation	29	**1,817**	**49,204**	**51,021**	**1,769**	**46,410**	**48,179**
Other provisions for decommissioning	30	**91**	**2,033**	**2,124**	**80**	**1,977**	**2,057**
Provisions for employee benefits	31	**998**	**17,627**	**18,625**	**1,106**	**20,630**	**21,736**
Other provisions	32	**3,104**	**2,908**	**6,012**	**2,529**	**2,356**	**4,885**
TOTAL PROVISIONS		6,010	71,772	77,782	5,484	71,373	76,857

NOTE 29 PROVISIONS RELATED TO NUCLEAR GENERATION –BACK-END OF THE NUCLEAR CYCLE, PLANT DECOMMISSIONING AND LAST CORES

Provisions related to nuclear generation comprise provisions for back-end nuclear cycle expenses (management of spent fuel and radioactive waste), provisions for plant decommissioning and provisions for last cores.

Provisions are estimated under the principles presented in note 1.3.2.2.

Obligations can vary noticeably depending on each country's legislation and regulations, and the technologies and industrial practices used in each company.

The movement in provisions for the back-end of the nuclear cycle, provisions for decommissioning and provisions for last cores breaks down as follows:

(in millions of euros)	31/12/2017	Increases	Decreases	Discount effect	Translation adjustments	Other movements	31/12/2018
Provisions for spent fuel management	12,353	500	(1,204)	748	(12)	(223)	12,162
Provisions for waste removal and conditioning	1,041	12	(29)	59	(3)	40	1,120
Provisions for long-term radioactive waste management	9,463	42	(231)	859	(6)	468	10,595
Provisions for the back-end of the nuclear cycle	**22,857**	**554**	**(1,464)**	**1,666**	**(21)**	**285**	23,877
Provisions for nuclear plant decommissioning	21,431	52	(162)	1,083	(57)	693	23,040
Provisions for last cores	3,891	-	-	166	(13)	60	4,104
Provisions for decommissioning and last cores	**25,322**	**52**	**(162)**	**1,249**	**(70)**	**753**	27,144
PROVISIONS RELATED TO NUCLEAR GENERATION	48,179	606	(1,626)	2,915	(91)	1,038	51,021

The change in provisions related to nuclear generation in 2018 is mainly due to a lower discount rate in France and the United Kingdom. The corresponding effects are included in the "Discount effect" (€835 million) for provisions with corresponding entries in the income statement, and in "Other movements" (€1,169 million) for changes in provisions with related assets (assets associated with provisions and underlying assets in France; the NLF receivable in the United Kingdom).

The breakdown of provisions by company is shown below:

(in millions of euros)	EDF Note 29.1	EDF Energy Note 29.2	Belgium	Total
Provisions for spent fuel management	10,698	1,464	-	12,162
Provisions for waste removal and conditioning	751	369	-	1,120
Provisions for long-term radioactive waste management	9,846	743	6	10,595
PROVISIONS FOR THE BACK-END OF THE NUCLEAR CYCLE AT 31/12/2018	21,295	2,576	6	23,877
Provisions for the back-end of the nuclear cycle at 31/12/2017	**20,326**	**2,527**	**4**	**22,857**
Provisions for nuclear plant decommissioning	15,985	6,754	301	23,040
Provisions for last cores	2,526	1,578	-	4,104
PROVISIONS FOR DECOMMISSIONING AND LAST CORES AT 31/12/2018	18,511	8,332	301	27,144
Provisions for decommissioning and last cores at 31/12/2017	**17,307**	**7,737**	**278**	**25,322**

29.1 NUCLEAR PROVISIONS IN FRANCE

In France, the provisions established by EDF SA for the nuclear generation fleet result from the Law of 28 June 2006 on long-term management of radioactive materials and waste, and the associated implementing provisions concerning secure financing of nuclear expenses.

In compliance with the accounting principles described in note 1.3.2.2.

- EDF books provisions to cover all obligations related to the nuclear facilities it operates;
- EDF holds dedicated assets for secure financing of long-term obligations (see note 45).

The calculation of provisions incorporates a level of risks and unknowns as appropriate to the operations concerned. The valuation of costs carries uncertainty factors such as:

- changes in legislation, particularly regarding safety, security and environmental protection, and financing of nuclear expenses;
- changes in the regulatory decommissioning process and the time necessary for issuance of administrative authorisation;
- future methods for storing long-lived radioactive waste and provision of storage facilities by the French agency for radioactive waste management ANDRA (*Agence nationale pour la gestion des déchets radioactifs*);
- changes in certain financial parameters such as discount rates, notably in view of the regulatory limits, inflation rates, or changes in the contractual terms of spent fuel management.

Details of changes in provisions for the back-end of the nuclear cycle, decommissioning and last cores are as follows:

(in millions of euros)	Notes	31/12/2017	Increases	Decreases	Discount effect (1)	Other movements (2)	31/12/2018
Provisions for spent fuel management	29.1.1	10,786	488	(986)	651	(241)	10,698
Provisions for waste removal and conditioning	29.1.2	726	10	(29)	43	1	751
Provisions for long-term radioactive waste management	29.1.2	8,814	38	(231)	826	399	9,846
Provisions for the back-end of the nuclear cycle		**20,326**	**536**	**(1,246)**	**1,520**	**159**	21,295
Provisions for nuclear plant decommissioning	29.1.3	14,920	52	(138)	752	399	15,985
Provisions for last cores	29.1.4	2,387	-	-	97	42	2,526
Provisions for decommissioning and last cores		**17,307**	**52**	**(138)**	**849**	**441**	18,511
PROVISIONS RELATED TO NUCLEAR GENERATION		37,633	588	(1,384)	2,369	600	39,806

(1) The discount effect comprises the €1,534 million cost of unwinding the discount, and the €835 million effect of the change in the real discount rate in 2018, which were recorded in the income statement for provisions with no related assets (cost of unwinding the discount).

(2) Other movements mainly include:
- reclassification of the provision for long-term radioactive waste management previously included in the provision for spent fuel management (€(298) million);
- the €718 million effect of the change in the real discount rate at 31 December 2018 for provisions with related assets.

Concerning non-EDF installations:

- EDF, COGEMA (now Orano Cycle) and the French Atomic Energy Commission (*Commissariat a l'Energie Atomique* or CEA) signed an agreement in December 2004 which transferred the management and financing of final shutdown, decommissioning and waste recovery and reconditioning for the UP1 reprocessing facility at Marcoule to the CEA. In return, EDF paid the CEA a one-time financial contribution covering its full share of the cost of outstanding operations, while remaining the owner of its final waste and bearing only the transport and storage costs;
- EDF, Areva and Areva NC (now Orano Cycle) signed two agreements in December 2008 and July 2010 defining the legal and financial terms for the transfer to Areva NC of EDF's contractual obligations regarding its financial contribution to the dismantling of La Hague installations and the recovery and

conditioning of waste. In application of those agreements, EDF paid Areva NC a one-time financial contribution covering its full share of the cost of outstanding operations, while remaining the owner of its final waste and bearing only the transport and storage costs.

29.1.1 Provisions for spent fuel management

EDF's currently adopted strategy with regards to the fuel cycle, in agreement with the French State, is to process spent fuel and to recycle the separated plutonium in the form of MOX fuel (Mixed OXide of plutonium and uranium).

The quantities processed by Orano at the request of EDF, totalling approximately 1,100 tonnes per year, are determined based on the quantity of recyclable plutonium in the reactors that are authorised to load MOX fuel.

Consequently, provisions for spent fuel cover services associated with the following:

- removal of spent fuel from EDF's generation centres, as well as reception and interim storage;
- processing, including conditioning and storage of recyclable matter.

The processing expenses included in these provisions exclusively concern spent fuel that can be recycled in existing facilities, including the portion in reactors but not yet irradiated.

Expenses are measured based on forecast physical flows at the year-end, with reference to the contracts with Orano which define the terms for implementation of the framework agreement for the period 2008-2040. The most recent of these agreements, signed on 5 February 2016, covers the period 2016-2023.

In 2018 the Board of Directors approved resumption of recycling of uranium from reprocessing (which was suspended in 2013 pending availability of a new industrial schema), with loading of the first fuel assemblies scheduled for 2023, subject to technical adaptations and the necessary authorisations from the Nuclear Safety Authority. The corresponding contracts were signed with the respective suppliers in the second quarter of 2018.

The portion of the provision for spent fuel management relating to uranium from reprocessing will be recovered once all the industrial, regulatory and economic conditions for resumption of uranium recycling have been fulfilled, but EDF has no control over fulfilment of some of these conditions (currently, no advance timetable has been set).

These provisions also cover long-term storage of spent fuel that cannot currently be recycled in existing installations: plutonium fuel (MOX) or uranium fuel derived from enriched processing, and fuel from Creys-Malville and Brennilis until fourth-generation reactors become available.

Following publication of the ministerial order of 28 December 2018 amending the order of 21 March 2007 on secure financing of nuclear expenses, in 2018 the provision covering interim storage of waste from spent fuel processing has been reclassified as part of the provision for long-term radioactive waste management (this concerns an amount of €298 million).

29.1.2 Provisions for waste removal and conditioning – Provisions for long-term radioactive waste management

29.1.2.1 Provisions for waste removal and conditioning

The provisions for waste removal and conditioning are reported separately from 1 January 2017.

They cover the following future expenses for radioactive waste resulting from operations or decommissioning (apart from spent fuel):

- characterisation and conditioning of waste;
- interim storage of waste.

Equipment assembly for the conditioning and intermediate storage facility for radioactive waste (*Installation de conditionnement et d'entreposage des déchets activés* – ICEDA) was completed in December 2018 and pre-service testing is currently in process. Information on the identification of EIP equipment (equipment that is important for protection of interests) has been added to the commissioning permit application (DAMS) which has now been sent to the ASN. The objective is to open the storage facility in September 2019.

29.1.2.2 Provisions for long-term radioactive waste management

These provisions concern future expenses for:

- removal and storage of radioactive waste resulting from decommissioning of nuclear installations operated by EDF;
- interim storage (reclassification in 2018 of €298 million from the provision for spent fuel management (see note 29.1.1), removal and storage of radioactive waste packages resulting from spent fuel processing;
- direct storage, where relevant, of spent fuel that cannot be recycled in existing installations: specifically plutonium fuel (MOX) or uranium fuel derived from enriched processing, and fuel from Creys-Malville and Brennilis;
- EDF's share of the costs of studies, construction, operation and maintenance, shutdown and surveillance of existing and future storage centres.

The volumes of waste concerned by provisions include existing packages of waste and all waste to be conditioned, resulting from plant decommissioning or spent fuel processing at La Hague (comprising all fuel in reactors at 31 December, irradiated or otherwise). These volumes are regularly reviewed, in keeping with the data declared for the purposes of the national waste inventory undertaken by ANDRA.

The provisions for long-term radioactive waste management break down as follows:

(in millions of euros)	**31/12/2018**	31/12/2017
Very low-level and low and medium-level waste	1,278	1,161
Long-lived low-level waste	292	265
Long-lived medium and high-level waste	8,276	7,388
PROVISIONS FOR LONG-TERM RADIOACTIVE WASTE MANAGEMENT	**9,846**	**8,814**

Very low-level and low and medium-level waste

Very low-level waste mainly comes from nuclear plant decommissioning, and generally takes the form of rubble (concrete, scrap metal, insulating materials and piping). This type of waste is stored at surface level at the Morvilliers storage centre managed by ANDRA.

Low and medium-level waste comes from nuclear facilities (gloves, filters, resins). This type of waste is stored at surface level at the Soulaines storage centre managed by ANDRA.

The cost of removing and storing short-lived waste (very low-level and low and medium-level) is assessed on the basis of current contracts with transporters and contracts with ANDRA for operation of the existing storage centres.

Long-lived low-level waste

Long-lived low-level waste belonging to EDF essentially consists of graphite waste from the ongoing decommissioning of the former UNGG (natural uranium graphite gas-cooled) reactors.

As this waste has a long lifetime, but is lower-level than long-lived medium and high-level waste, specific subsurface storage requirements apply under the French Law of 28 June 2006.

Following the initial geological investigations, in July 2015 ANDRA remitted a report on the proposed storage centre for long-lived low-level waste on a site located in the Soulaines region (Aube) in France. This report was submitted to the ASN for its opinion. Uncertainties remain about the site's capacity to accommodate all of the waste included in the baseline inventory of the long-lived low-level waste storage facility. Further studies are planned under the 2016-2018 National Plan for the Management of Radioactive Materials and Waste, concerning both the feasibility of this storage centre and the search for additional waste management solutions. A general industrial plan for management of all long-lived low-level radioactive waste is also to be remitted by the end of 2019.

Long-lived medium and high-level waste

Long-lived medium and high-level waste essentially comes from processing of spent fuel, and to a lesser extent waste resulting from nuclear plant decommissioning (metallic components that have been inside the reactor).

The French Law of 28 June 2006 requires reversible storage in deep geological layers for this type of waste.

The provision established for long-lived medium and high-level waste is the largest component of provisions for long-term radioactive waste management.

Until June 2015 the gross value and disbursement schedules for forecast expenses were based on a scenario of industrial geological waste storage, following conclusions presented in the first half of 2005 by a working group formed under supervision of the State involving representatives of the administrations concerned, ANDRA and the producers of waste (EDF, Orano, CEA). EDF applied a reasonable approach to information supplied by this working group, leading to a benchmark cost, for storage of waste from all producers, of €14.1 billion under the economic conditions of 2003 (€20.8 billion under 2011 economic conditions).

In 2012 ANDRA carried out preliminary conceptional studies for the Cigéo geological storage project, after discussing the technical optimisations proposed by the producers of waste.

On this basis, ANDRA drew up figures which, in compliance with the Law of 28 June 2006, were subjected to a consultation process with waste producers started in late 2014 by the French Department for Energy and Climate *(Direction Générale de l'Énergie et du Climat* or DGEC). In April 2015 EDF and the other producers sent the DGEC their comments on ANDRA's report and a joint estimation of the target Cigéo storage cost due to divergent approaches. All this information was included, together with the ASN's opinion, in a report submitted to the Minister for Ecology, Sustainable Development and Energy.

On 15 January 2016 the Ministry of Ecology, Sustainable Development and Energy issued a Ministerial Order setting the target cost for the Cigéo storage project at €25 billion under 2011 year-end economic conditions. The cost as defined constitutes an objective to be met by ANDRA, in compliance with safety standards set by the ASN, working in close liaison with the operators of nuclear installations.

Publication of this Order entailed an €820 million adjustment to the provision shown in the Group's financial statements at 31 December 2015. The cost of the Cigéo project defined in the Order has replaced the estimated benchmark cost of €20.8 billion previously used by EDF for its consolidated financial statements.

In application of this Ministerial Order, the cost of the Cigéo project will be regularly updated, at least at each key milestone in the course of the project's development (authorisation to create the facility, commissioning, end of the "pilot industrial phase", safety reviews) in accordance with the opinion of the ASN.

Design studies for future facilities are currently in process with ANDRA and stakeholders. They include technical and economic optimisation and the responses to the safety option report sent by ANDRA to the ASN in April 2016. The law of 11 July 2016 also clarified the concept of reversibility. In 2017 ANDRA opted for a new configuration to provide the basis for the preliminary project.

Under the schedule prepared by ANDRA, the application to build Cigéo (classified as a basic nuclear facility) should be made in 2019 and permission is expected to be granted in 2022. After an industrial pilot phase starting in 2026, the first waste packages should be received in 2031.

On 11 January 2018, the ASN issued its opinion on the Cigéo safety option file DOS Cigéo). It considered that the project had reached satisfactory overall technological maturity at that stage and required examination of alternatives to the proposals for storage of bituminous waste at Cigéo. In September 2018, prior to filing an application for authorisation to create Cigéo in 2019, a group of experts was appointed by the DGEC to draw up a report on current bituminous waste management practices, focusing on three themes: knowledge of bituminous waste and its behaviour, neutralisation processes, and storage arrangements.

29.1.3 Decommissioning provisions for nuclear power plants

EDF bears full technical and financial responsibility for decommissioning of the nuclear plants it operates. The decommissioning process is governed by French Law of 13 June 2006, Decree 2007-1557 of 2 November 2007, and the French Environment Code (Articles L. 593-25 and following). It involves the following operations for each site:

- a shutdown declaration, to be made at least two years prior to the planned shutdown date;
  - since the Energy Transition Law of 17 August 2015, the final shutdown, which takes place during the operating phase of the basic nuclear facility, is considered separately from dismantling, as a notable change of lesser importance (simply requiring a declaration by the operator to the Minister and the ASN),
- an application for decommissioning, which after examination by the authorities and a public inquiry, leads to a single decree authorising the decommissioning;

- key progress reviews with the ASN, included in a formal safety procedure specific to dismantling operations;
- an internal authorisation procedure for the operator, independent of operational personnel and audited by the ASN, allowing some specific work to be started ahead of the authorised safety procedure;
- finally, once these operations are complete, declassification of the facility to remove it from the legal regime governing basic nuclear facilities.

The decommissioning scenario adopted by EDF complies with France's environmental Code, which requires as short a period as possible to elapse between final shutdown and dismantling in economically acceptable conditions and in compliance with the principles laid down in Article L. 1333-1 of the public health code (radioprotection) and section II of Article L. 110-1 of the environmental code (protection of the environment). The intended end-state is industrial use: the sites will be restored to their original condition and will be reusable for industrial facilities.

The ongoing operations concern plants that were constructed and operated before the current nuclear fleet ("first-generation" plants), and the Superphenix plant and Irradiated Materials Workshop at Chinon. These operations cover four different technologies: a heavy water reactor (Brennilis), a sodium-cooled fast-neutron reactor (the Superphenix at Creys-Malville), natural uranium graphite gas-cooled (UNGG) reactors (at Chinon, Saint Laurent and Bugey) and a pressurised water reactor (PWR at Chooz). Each of them is a first for EDF, and apart from the PWR, they concern reactor technologies for which there is little or no international experience. They therefore require development of new methods and technologies that are riskier than technologies for which feedback already exists. Decommissioning of the Chooz PWR is benefiting from past experience (essentially in the US and limited), but the reactor has the specificity of being located in a cave, making this a unique operation, generating experience that is not immediately transposable and involves specific risks.

The experience gained from dismantling the Chooz PWR will make the studies and estimates of future decommissioning of the nuclear fleet currently in operation ("second-generation" plants) as robust as possible. But so far, neither EDF nor any other operator has begun a decommissioning programme on a scale comparable to the current PWR fleet, and as a result the estimates include both opportunities and risks, especially the risks associated with the scale effect.

The decommissioning provisions cover future decommissioning expenses as described above (excluding the cost of removing and storing waste, which is covered by the provisions for long-term waste management).

The preliminary dismantling plan and the priority areas for the fourth periodic review of Fessenheim (RP4) were sent to the ASN in July 2018, with the objective of filing the dismantling and RP4 documents in mid-2020.

The Consolidated Preliminary Plan (*Avant-Projet Consolidé* or APC) is currently being finalised, with studies expanding on the Summary Preliminary Plan (*Avant-Projet Sommaire* or APS), derisking, etc.

Details of changes in decommissioning provisions for nuclear power plants are as follows:

(in millions of euros)	31/12/2017	Increases	Decreases	Discount effect	Other movements	31/12/2018
Provisions for decommissioning nuclear plants in operation	11,616	-	(17)	482	399	12,480
Provisions for decommissioning permanently shut-down nuclear plants	3,304	52	(121)	270	-	3,505
DECOMMISSIONING PROVISIONS FOR NUCLEAR POWER PLANTS	14,920	52	(138)	752	399	15,985

For nuclear power plants currently in operation (PWR pressurized water reactor plants with 900MW, 1,300MW and N4 reactors)

Until 2013, provisions were estimated based on a 1991 study by the French Ministry of Trade and Industry, which set an estimated benchmark cost for decommissioning expressed in €/MW, confirming the assumptions defined in 1979 by the PEON commission. These estimates had been confirmed from 2009 by a detailed study of decommissioning costs conducted by EDF at the representative site of Dampierre (four 900MW units), and its results were corroborated by an intercomparison with the study carried out by consultants LaGuardia, based mainly on the Maine Yankee reactor in the US.

In 2014 the Dampierre study was reviewed by EDF to make sure that the previous calculations were still valid in view of recent developments and experience, both internationally and internally. For this revision, the decommissioning provisions for plants in operation were based on costs resulting from the Dampierre study, in

order to incorporate best estimates and feedback from inside and outside France. This change of estimate had no significant impact on the level of provisions at 31 December 2014.

Between June 2014 and July 2015, an audit of dismantling costs for EDF's nuclear fleet currently in operation was conducted by specialised consulting firms, at the request of the French Department for Energy and Climate (*Direction Générale de l'Énergie et du Climat* or DGEC). On 15 January 2016 the DGEC published a summary of the audit report. It stated that although estimating the cost of decommissioning nuclear reactors is a demanding exercise due to relatively limited past experience, the prospects of changes in techniques, and the distant timing of the expenditure, overall, the audit confirmed EDF's estimate of decommissioning costs for its nuclear fleet currently in operation. The DGEC also made a number of recommendations to EDF following this audit.

In 2016, EDF revised the decommissioning estimate, in order to incorporate the audit recommendations and past experience gained from dismantling operations for first-generation reactors (particularly Chooz A).

A detailed analytical approach was used to revise this estimate, identifying all costs for the engineering, construction work, operation and waste processing involved in future decommissioning of reactors currently in operation. This led to figures based on detailed timetables for plant decommissioning. The approach adopted made it possible to explore more thoroughly the assessment of costs specific to the initial units of each series, estimated for each series based on transposition coefficients applied to the baseline costs for the initial 900MW unit, and the series and mutualisation effects, as these costs and effects are inherent to the fleet's size and configuration.

The natures of the principal mutualisation and series effects used to arrive at the estimate are explained below.

There are several types of mutualisation effects:

- some of them relate to the fact that several reactors may share common buildings and facilities on the same site, and these buildings and facilities will not have to be decommissioned twice. Structurally, decommissioning a pair of reactors on the same site costs less than decommissioning two standalone reactors on two different sites. In France, unlike other countries, there are no single reactors but sites with two or four, and in one case six reactors;
- certain costs are no higher when 2 or 4 reactors are decommissioned on the same site. This is usually the case for surveillance costs and cost of maintaining safe operating conditions on the site;
- waste processing in centralised facilities (for example for dismantling major components) costs less than having several waste processing facilities at the decommissioning location.

Series effects are mainly of two types:

- first, in a fleet using the same technology, many of the studies do not need to be repeated each time;
- second, in a fleet using the same technology, robots and tooling can be largely reused from one site to another.

Such series effects are comparable in nature to the effects observed during construction of the fleet, in terms of studies or component manufacturing plants.

For example, for the 900MW fleet, a series effect of approximately 20% is expected between the first-of-a-kind reactor with 2 units and an average 2-units reactor.

Series and mutualisation effects in particular explain why it is not appropriate simply to compare the average decommissioning cost per reactor between the French fleet and other countries' nuclear fleets.

The figures only marginally reflect changes in productivity and the learning effect. The external audit of the decommissioning cost for the fleet currently in operation, ordered by the DGEC, considered that the learning effect incorporated into the estimate was conservative.

For reasons of prudence, the estimate also includes an assessment of risks, contingencies and uncertainties.

The Group considers that the work done to revise the estimate answers the recommendations issued after the audit. The approach adopted and its results have been presented to the administrative authority and gave rise to further questions and discussions.

EDF is also continuing to support its analyses through an international comparison, making it sure it takes into consideration a number of factors that could distort direct comparisons, for example differences in the scope concerned by costs estimate, or national and regulatory contexts.

The results of this detailed approach led to limited changes overall in the cost estimate and the associated provisions at 31 December 2016, apart from the consequences of the change in the depreciation period for 900MW series plants (excluding Fessenheim) at 1 January 2016, and the effect of changes in discount rates at 31 December 2016, i.e.:

- an increase of €321 million in the estimated decommissioning costs and an increase of €334 million in the estimated cost of long-term management of long-lived medium-level waste;
- a decrease of €(451) million in the provision for plant decommissioning, and an increase of €162 million in the provision for long-term management of long-lived medium-level waste, with corresponding changes in the underlying assets.

After its revision in 2016, it was decided that the estimate would be reviewed annually. The 2017 and 2018 reviews led to non-significant adjustments.

For permanently shut-down nuclear power plants

Unlike the PWR fleet currently in operation, the first-generation reactors now shut down used a range of different technologies: a PWR reactor at Chooz A, UNGG (natural uranium graphite gas-cooled) reactors at Bugey, St-Laurent and Chinon, a heavy water reactor at Brennilis, and a sodium-cooled fast neutron reactor at Creys-Malville.

The decommissioning costs are based on contractor quotes, which take account of accumulated industrial experience, unforeseen and regulatory developments, and the latest available figures.

In 2015 the industrial decommissioning strategy for UNGG plants was totally revised. The previously selected strategy was based on a scenario involving "underwater" dismantling of caissons (UNGG reactor buildings) for four of the reactors, with direct graphite storage in a centre currently under examination by ANDRA (see Long-lived low-level waste, note 29.1.2). Several new technical developments showed that the alternative "in-air" dismantling solution for the caissons would improve industrial control of operations and was apparently more favourable in terms of safety, radioprotection and environmental impact. The company therefore selected a new "in-air" dismantling scenario as the benchmark strategy for all six caissons. This scenario includes a consolidation phase, building on experience acquired from dismantling the first caisson before beginning work on the other five. The decommissioning phase will ultimately be longer than previously planned, leading to higher contractor quotes due to the induced operating costs.

Updating the industrial decommissioning scenario for first-generation power plants, particularly UNGGs plants, led to a €590 million increase in the provision at 31 December 2015.

The amended industrial scenario was presented to the ASN's commissioners on 29 March 2016.

At the request of the ASN, an independent expert review was ordered in the first quarter of 2017 to analyse EDF's chosen solutions for decommissioning of its 6 UNGG reactors. The conclusions supported the main options chosen. A meeting took place with the ASN commissioners in June 2017 based on these conclusions and a justification file remitted by EDF the previous March.

The strategy file, the safety option report concerning establishment of a secure configuration, and the detailed timetable for operations over the period 2017-2032 were sent to the ASN in late December 2017. In 2018 the ASN issued its main questions and conclusions about the UNGG strategy file. "In-air" dismantling for all reactors, the usefulness of an industrial demonstrator, and the timetable for dismantling the first-of-a-kind reactor (Chinon A2) appear to be settled, but discussions are continuing regarding the dismantling timetable for the other 5 reactors. EDF's proposed schedule allows for significant experience-based adjustments (after dismantling the first reactor) before beginning the larger-scale phases. While acknowledging the need to incorporate experience from the first-of-a-kind reactor, the ASN has so far not expressed an opinion on the timetable as a whole. At a meeting on 12 February 2019 EDF presented all the information justifying its proposed timetable to the ASN's panel of commissioners. The ASN is expected to issue draft decisions in 2019 that will be submitted for public consultation.

Due to uncertainties over the complex operations to be undertaken (particularly development of new methods and technologies), the provisions are very sensitive to the sequencing of operations, and the overall timetable for dismantling all six reactors. If EDF were ultimately to amend the timetable of decommissioning operations (shortening the sequence), that would entail an increase in provisions.

After the revision of the estimated cost in 2015, the decision was made that it should be reviewed annually. The 2016 review led to non-significant adjustments, apart from one increase of €125 million for a specific installation (the Irradiated Materials Workshop at Chinon). The 2018 review, like the 2017 review, led to non-significant adjustments.

29.1.4 Provisions for last cores

These provisions cover the future expenses resulting from scrapping fuel that will only be partially irradiated when the reactor is shut down. It is measured based on:

- the cost of the loss on fuel in the reactor that is not totally spent at the time of final reactor shutdown and cannot be reused due to technical and regulatory constraints;
- the cost of fuel processing, and waste removal and storage operations. These costs are valued in a similar way to provisions for spent fuel management and long-term radioactive waste management.

These unavoidable costs are components of the cost of nuclear reactor shutdown and decommissioning. As such, they are fully covered by provision from the commissioning date and an asset associated with the provision is recognised.

29.1.5 Discounting of provisions related to nuclear generation and sensitivity analyses

29.1.5.1 Discount rate

Calculation of the discount rate

The discount rate is determined based on long-series data for a sample of bonds with maturities as close as possible to that of the liability. However, some expenses covered by these provisions will be disbursed over periods significantly longer than the duration of instruments generally traded on the financial markets.

The benchmark used to determine the discount rate is the sliding 10-year average of the return on French OAT 2055 treasury bonds which have a similar duration to the obligations, plus the spread of corporate bonds rated A to AA, which include EDF.

The methodology used to determine the discount rate, particularly the reference to sliding 10-year averages, is able to prioritise long-term trends in rates, in keeping with the long-term horizon for disbursements. The discount rate is therefore revised in response to structural developments in the economy leading to medium and long-term changes.

The assumed inflation rate is determined in line with the forecasts provided by consensus and expected inflation based on the returns on inflation-linked bonds.

The discount rate determined in this way is 3.9% at 31 December 2018, assuming inflation of 1.5% (4.1% and 1.5% respectively at 31 December 2017), giving a real discount rate of 2.4% at 31 December 2018 (2.6% at 31 December 2017).

Regulatory discount rate limit

The discount rate applied must also comply with two regulatory limits. Under the amended decree of 23 February 2007 and the ministerial order of 21 March 2007, itself modified by the order of 29 December 2017, the discount rate must be lower than:

- a regulatory maximum, set until 31 December 2026 as the weighted average of two terms, the first set at 4.3%, and the second corresponding to the arithmetic average over the 48 most recent months of the TEC 30-year rate plus 100 points. The weighting given to the first constant term of 4.3% reduces on a straight-line basis from 100% at 31 December 2016 to 0% at 31 December 2026;
- and the expected rate of return on assets covering the liability (dedicated assets).

The ceiling rate based on the TEC 30-year rate is 4.0% (3.97%, rounded up to 4.0%) at 31 December 2018 (4.1% at 31 December 2017).

The discount rate used at 31 December 2018 is 3.9%

29.1.5.2 Analyses of sensitivity to macro-economic assumptions

Sensitivity to assumptions concerning costs, inflation rate, long-term discount rate, and disbursement schedules can be estimated through comparison of the gross amount estimated under year-end economic conditions with the present value of the amount.

	31/12/2018		31/12/2017	
(in millions of euros)	Costs based on year-end economic conditions	Amounts in provisions at present value	Costs based on year-end economic conditions	Amounts in provisions at present value
Spent fuel management	18,737	10,698	19,058	10,786
Waste removal and conditioning	1,194	751	1,203	726
Long-term radioactive waste management	30,970	9,846	29,396	8,814
BACK-END NUCLEAR CYCLE EXPENSES	**50,901**	**21,295**	**49,657**	**20,326**
Decommissioning provisions for nuclear plants in operation	20,755	12,480	20,563	11,616
Decommissioning provisions for shut-down nuclear plants	6,576	3,505	6,472	3,304
Provisions for last cores	4,346	2,526	4,332	2,387
DECOMMISSIONING AND LAST CORE EXPENSES	**31,677**	**18,511**	**31,367**	**17,307**

This approach can be complemented by estimating the impact of a change in the discount rate on the present value.

In application of Article 11 of the Decree of 23 February 2007, the following table reports these details for the main components of provisions for the back-end of the nuclear cycle, decommissioning of nuclear plants and last cores:

At 31 December 2018:

	Amounts in provisions at present value	Sensitivity to discount rate			
		Balance sheet provisions		Pre-tax net income	
(in millions of euros)		+ 0.20%	- 0.20%	+ 0.20%	- 0.20%
Back-end nuclear cycle expenses:					
- spent fuel management	10,698	(218)	237	185	(202)
- waste removal and conditioning	751	(23)	25	14	(15)
- long-term radioactive waste management	9,846	(597)	780	498	(673)
Decommissioning and last core expenses:					
- decommissioning of nuclear plants in operation	12,480	(496)	520	7	(7)
- decommissioning provisions for shut-down nuclear plants	3,505	(138)	149	138	(149)
- last cores	2,526	(88)	94	-	-
TOTAL	**39,806**	**(1,560)**	**1,805**	**842**	**(1,046)**

At 31 December 2017:

(in millions of euros)	Amounts in provisions at present value	Sensitivity to discount rate			
		Balance sheet provisions		Pre-tax net income	
		+0.20%	-0.20%	+0.20%	-0.20%
Back-end nuclear cycle expenses:					
- spent fuel management	10,786	(221)	238	190	(206)
- waste removal and conditioning	726	(22)	24	13	(14)
- long-term radioactive waste management	8,814	(497)	562	407	(464)
Decommissioning and last core expenses:					
- decommissioning of nuclear plants in operation	11,616	(477)	501	7	(7)
- decommissioning provisions for shut-down nuclear plants	3,304	(125)	135	125	(135)
- last cores	2,387	(85)	90	-	-
TOTAL	**37,633**	**(1,427)**	**1,550**	**742**	**(826)**

29.2 EDF ENERGY'S NUCLEAR PROVISIONS

The specific financing terms for long-term nuclear obligations related to EDF Energy are reflected as follows in the EDF group's financial statements:

- the obligations are reported in liabilities in the form of provisions amounting to €10,908 million at 31 December 2018;
- in the assets, EDF Energy reports receivables corresponding to the amounts payable under the restructuring agreements by the NLF, for non-contracted obligations or decommissioning obligations, and by the British Government for contracted obligations (or historical liabilities).

These receivables are discounted at the same real rate as the obligations they are intended to finance. They are included in "Financial assets" in the consolidated balance sheet (see note 36.3) at the amount of €9,220 million at 31 December 2018 (€8,650 million at 31 December 2017).

Details of changes in provisions for the back-end of the nuclear cycle and provisions for decommissioning and last cores are as follows:

(in millions of euros)	31/12/2017	Increases	Decreases	Discount effect	Translation adjustments	Other movements [1]	31/12/2018
Provisions for spent fuel management	1,567	12	(218)	97	(12)	18	1,464
Provisions for waste removal and conditioning	315	2	-	16	(3)	39	369
Provisions for long-term radioactive waste management	645	2	-	33	(6)	69	743
Provisions for the back-end of the nuclear cycle	**2,527**	**16**	**(218)**	**146**	**(21)**	**126**	2,576
Provisions for nuclear plant decommissioning	6,233	-	(24)	322	(57)	280	6,754
Provisions for last cores	1,504	-	-	69	(13)	18	1,578
Provisions for decommissioning and last cores	**7,737**	**-**	**(24)**	**391**	**(70)**	**298**	8,332
PROVISIONS RELATED TO NUCLEAR GENERATION	10,264	16	(242)	537	(91)	424	10,908

(1) Other movements include €404 million for the change in nuclear liabilities, reflecting the lower discount rate, with an equivalent change in the receivable corresponding to amounts reimbursable by the NLF (Nuclear Liabilities Fund) and the British government.

29.2.1 Regulatory and contractual framework

Amendments signed with the Nuclear Liabilities Fund (NLF – an independent trust set up by the UK Government as part of the restructuring of British Energy) following the EDF group's acquisition of British Energy had a limited impact on the contractual financing commitments made to British Energy by the UK Secretary of State and the NLF under the "Restructuring Agreements". These agreements were entered into by British Energy on 14 January 2005 as part of the restructuring led by the UK Government from 2005 in order to stabilise British Energy's financial position. British Energy Generation Limited changed its name to EDF Energy Nuclear Generation Limited on 1 July 2011 and replaced British Energy in these agreements and amendments.

Under the terms of the Restructuring Agreements:

- the NLF agreed to fund, to the extent of its assets: (i) qualifying contingent and/or latent nuclear liabilities (including liabilities for management of spent fuel from the Sizewell B power station); and (ii) qualifying decommissioning costs for EDF Energy's existing nuclear power stations;
- the Secretary of State agreed to fund: (i) qualifying contingent and/or latent nuclear liabilities (including liabilities for the management of spent fuel from the Sizewell B power station) and qualifying decommissioning costs related to EDF Energy's existing nuclear power stations, to the extent that they exceed the assets of the NLF; and (ii) subject to a cap of £2,185 million (in December 2002 monetary values, adjusted accordingly), qualifying known existing liabilities for EDF Energy's spent fuel (including liabilities for management of spent fuel from plants other than Sizewell B loaded in reactors prior to 15 January 2005);
- EDF Energy is responsible for funding certain excluded or disqualified liabilities (e.g. those defined as EDF Energy liabilities), and additional liabilities which could be created as a result of failure by EDF Energy to meet minimum performance standards under applicable law. The obligations of EDF Energy to the NLF and the Secretary of State are guaranteed by the assets of the principal members of EDF Energy.

EDF Energy also made commitments to pay:

- annual decommissioning contributions for a period limited to the useful life of the plants as at the date of the "restructuring agreements"; the corresponding provision amounts to €117 million at 31 December 2018;
- £150,000 (indexed to inflation) per tonne of uranium loaded in the Sizewell B reactor after the date of the "restructuring agreements".

Furthermore, EDF Energy entered into a separate contract with the Nuclear Decommissioning Authority (NDA) for management of AGR spent fuel and associated radioactive waste resulting from operation of power plants other than Sizewell B after 15 January 2005, and bears no responsibility for this fuel and waste once it is transferred to the processing site at Sellafield. The corresponding costs of £150,000 (indexed to inflation) per tonne of loaded uranium – plus a rebate or surcharge dependent on market electricity price and electricity generated in the year – are included in inventories (see note 1.3.17.1).

29.2.2 Provisions for the back-end of the nuclear cycle

Spent fuel from the Sizewell B PWR (pressurised water reactor) plant is stored on site. Spent fuel from other plants is transferred to Sellafield for storage and reprocessing.

EDF Energy's provisions for the back-end of the nuclear cycle concern obligations for reprocessing and storage of spent fuel and long-term storage of radioactive waste, required by the existing regulations in the UK approved by the Nuclear Decommissioning Authority (NDA). Their amount is based on contractual agreements or if this is not possible, on the most recent technical estimates.

	31/12/2018		31/12/2017	
(in millions of euros)	Costs based on year-end economic conditions	Amounts in provisions at present value	Costs based on year-end economic conditions	Amounts in provisions at present value
Spent fuel management	2,665	1,464	2,829	1,567
Waste removal and conditioning	1,856	369	1,827	315
Long-term radioactive waste management	3,645	743	3,589	645
BACK-END NUCLEAR CYCLE EXPENSES	**8,166**	**2,576**	**8,245**	**2,527**

29.2.3 Provisions for nuclear plant decommissioning

Provisions for decommissioning of nuclear plants result from management's best estimates. They cover the full cost of decommissioning and are measured on the basis of existing techniques and methods that are most likely to be used for application of current regulations. The current costs are based on Baseline Decommissioning Plans produced in 2016 (3-year revision) and approved in 2013 and assume that plants will be decommissioned and the land will ultimately be reused.

	31/12/2018		31/12/2017	
(in millions of euros)	Costs based on year-end economic conditions	Amounts in provisions at present value	Costs based on year-end economic conditions	Amounts in provisions at present value
PLANT DECOMMISSIONING EXPENSES	**15,741**	**6,637**	**15,520**	**6,111**

The table above concerns decommissioning obligations excluding the present value of decommissioning contributions payable to the NLF, which is €117 million at 31 December 2018 (see note 29.2.1).

29.2.4 Discounting of provisions related to nuclear generation

The discount rate has been calculated using an average series of data for a sample of UK Government gilts over the longest available durations plus the spread of UK Corporate bonds rated A to AA, again over the longest-term duration. The implicit inflation rate used in determining a discount rate is based on a long-term forecast of adjusted retail prices (the UK's CPIH index).

At 31 December 2018, EDF Energy applied a real discount rate of 2.5% to nuclear liabilities in the United Kingdom (2.7% at 31 December 2017).

NOTE 30 OTHER PROVISIONS FOR DECOMMISSIONING

The breakdown by company is as follows:

(in millions of euros)	EDF	EDF Energy	Edison	Framatome [1]	Other entities [2]	Total
OTHER PROVISIONS FOR DECOMMISSIONING AT 31/12/2018 [2]	**658**	**132**	**716**	**350**	**268**	**2,124**
Other provisions for decommissioning at 31/12/2017	**626**	**130**	**692**	**347**	**262**	**2,057**

(1) Including €78 million of provisions concerning basic nuclear facilities in France.
(2) Including €46 million of provisions concerning SOCODEI's basic nuclear facilities in France.

Other provisions for decommissioning principally concern fossil-fired power plants, hydrocarbon production assets and installations for the production of nuclear fuel assemblies.

The costs of decommissioning fossil-fired power plants are calculated using regularly updated studies based on estimated future costs, measured by reference to the charges recorded on past operations and the most recent estimates for plants still in operation.

The provision recorded at 31 December 2018 reflects the most recent known contractor quotes and commissioning of new generation assets.

NOTE 31 PROVISIONS FOR EMPLOYEE BENEFITS

31.1 EDF GROUP

(in millions of euros)	31/12/2018	31/12/2017
Provisions for employee benefits – current portion	998	1,106
Provisions for employee benefits – non-current portion	17,627	20,630
PROVISIONS FOR EMPLOYEE BENEFITS	18,625	21,736

31.1.1 Breakdown of the change in the net liability

(in millions of euros)	Obligations	Fund assets	Net Liability
Balance at 31/12/2017 (1)	42,721	(21,895)	20,826
Net expense for 2018	1,892	(475)	1,417
Actuarial gains and losses	(3,898)	746	(3,152)
Employer's contributions to funds	-	(331)	(331)
Employees' contributions to funds	15	(15)	-
Benefits paid	(2,194)	1,131	(1,063)
Translation adjustment	(53)	61	8
Changes in scope of consolidation	-	-	-
Other movements	(4)	(13)	(17)
BALANCE AT 31/12/2018	38,479	(20,791)	17,688
Including:			
Provisions for employee benefits			18,625
Non-current financial assets			(937)

(1) The net liability at 31 December 2017 comprised €21,736 million for the provisions for employee benefits and €(910) million of non-current financial assets, giving a net liability amount of €20,826 million.

Actuarial gains and losses on obligations amount to €(3,898) million for 2018, including €(3,323) million in France as a result of the €(2,174) million change in the discount rate, €(462) million for updating the mortality table, and €(491) million for updating the wage law; and €(518) million in the United Kingdom, essentially associated with changes in the discount and inflation rates (see note 31.3.6).

Actuarial gains and losses on fund assets amount to €746 million for 2018. They mainly result from a €463 million change in the United Kingdom and a €259 million change in France due to the poor performance on the equity markets.

Actuarial gains and losses on obligations amount to €(400) million for 2017, essentially comprising €194 million in the United Kingdom associated with changes in the discount and inflation rates and €(598) million in France, mainly attributable to experience adjustments.

31.1.2 Post-employment and other long-term employee benefit expenses

(in millions of euros)	2018	2017
Current service cost	(1,018)	(1,010)
Past service cost	(19)	-
Actuarial gains and losses – long-term benefits	20	(67)
Net expenses recorded as operating expenses	**(1,017)**	**(1,077)**
Interest expense (discount effect)	(875)	(884)
Return on fund assets	475	470
Net interest expense included in financial result	**(400)**	**(414)**
EMPLOYEE BENEFIT EXPENSES RECORDED IN THE INCOME STATEMENT	(1,417)	(1,491)
Actuarial gains and losses – post-employment benefits	3,898	400
Actuarial gains and losses on fund assets	(746)	721
Actuarial gains and losses	**3,152**	**1,121**
Translation adjustments	**(8)**	**(17)**
GAINS AND LOSSES ON EMPLOYEE BENEFITS RECORDED DIRECTLY IN EQUITY	3,144	1,104

31.1.3 Net employee benefit liability by geographical area

(in millions of euros)	France [1]	United Kingdom	Other	Total
Obligations at 31/12/2017	**32,701**	**8,956**	**1,064**	**42,721**
Net expense for 2018	1,342	505	45	1,892
Actuarial gains and losses	(3,323)	(518)	(57)	(3,898)
Employees' contributions to funds	-	15	-	15
Benefits paid	(1,519)	(644)	(31)	(2,194)
Translation adjustment	-	(66)	13	(53)
Changes in scope of consolidation	-	-	-	-
Other movements	-	-	(4)	(4)
OBLIGATIONS AT 31/12/2018	29,201	8,248	1,030	38,479
Fair value of fund assets	(11,165)	(9,039)	(587)	(20,791)
NET EMPLOYEE BENEFIT LIABILITY AT 31/12/2018	18,036	(791)	443	17,688
Including:				
Provisions for employee benefits	18,036	146	443	18,625
Non-current financial assets [2]		(937)		(937)

(1) France comprises the two operating segments "France – Generation and Supply" and "France – Regulated activities" (see note 31.2).
(2) At 31 December 2018, EDF Energy recognised surplus funding on its EEGSG and BEGG pension schemes (see note 31.3.1).

(in millions of euros)	France [1]	United Kingdom	Other	Total
Obligations at 31/12/2017	**32,701**	**8,956**	**1,064**	**42,721**
Fair value of fund assets	(11,621)	(9,684)	(588)	(21,895)
PROVISIONS FOR RMPLOYEE BENEFITS AT 31/12/2017	21,080	(728)	474	20,826
Including:				
Provisions for employee benefits	21,080	182	474	21,736
Non-current financial assets	-	(910)	-	(910)

(1) France comprises the two operating segments "France – Generation and Supply" and "France – Regulated activities" (see note 31.2).

31.2 FRANCE (REGULATED ACTIVITIES, AND GENERATION AND SUPPLY)

Given the strong similarities between their pension schemes, the two operating segments "France – Generation and Supply" and "France – Regulated activities" (see note 6.1) are combined here into a single subtotal, "France", which primarily includes EDF and Enedis. Almost all of these companies' employees have IEG status, including the special IEG pension and other IEG benefits.

These benefits are described in note 1.3.22.

31.2.1 Details of changes in the provisions

(in millions of euros)	Obligations	Fund assets	Provisions in the balance sheet
Balances at 31/12/2017	**32,701**	**(11,621)**	**21,080**
Net expense for 2018	1,342	(221)	1,121
Actuarial gains and losses	(3,323)	259	(3,064)
Contributions to funds	-	(44)	(44)
Benefits paid	(1,519)	462	(1,057)
BALANCES AT 31/12/2018	29,201	(11,165)	18,036

31.2.2 Post-employment and other long-term employee benefit expenses

(in millions of euros)	2018	2017
Current service cost	(732)	(725)
Past service cost	-	-
Actuarial gains and losses – other long-term benefits	17	(68)
Net expenses recorded as operating expenses	***(715)***	***(793)***
Interest expense (discount effect)	(627)	(634)
Return on fund assets	221	220
Net interest expense included in financial result	***(406)***	***(414)***
EMPLOYEE BENEFIT EXPENSES RECORDED IN THE INCOME STATEMENT	(1,121)	(1,207)
Actuarial gains and losses – post-employment benefits	3,323	598
Actuarial gains and losses on fund assets	(259)	161
Actuarial gains and losses	***3,064***	***759***
GAINS AND LOSSES ON EMPLOYEE BENEFITS RECORDED DIRECTLY IN EQUITY	3,064	759

Actuarial gains and losses on post-employment benefits break down as follows:

(in millions of euros)	2018	2017
Experience adjustments	(90)	462
Changes in demographic assumptions	462	-
Changes in financial assumptions [(1)]	2,968	68
ACTUARIAL GAINS AND LOSSES ON OBLIGATIONS	3,340	530
Including:		
-Actuarial gains and losses on post-employment benefits	3,323	598
-Actuarial gains and losses on other long-term benefits	17	(68)

(1) Financial assumptions mainly concern the discount rate, inflation rate and wage increase rate.

The actuarial gains and losses on obligations generated over 2018 amount to €3,340 million, and are mainly associated with changes in the discount rate, the wage increase rate and the updating of the mortality table (see note 31.2.7).

The actuarial gains and losses on obligations generated over 2017 amount to €530 million, and are mainly attributable to experience adjustments.

31.2.3 Provisions for employee benefits by nature

At 31 December 2018:

(in millions of euros)	Obligations	Fund assets	Provisions in the balance sheet
Provisions for post-employment benefits at 31/12/2018	**27,798**	**(11,165)**	**16,633**
Comprising:			
Pensions	21,514	(10,416)	11,098
Benefits in kind (electricity/gas)	4,233	-	4,233
Retirement gratuities	822	(734)	88
Other	1,229	(15)	1,214
Provisions for other long-term employee benefits at 31/12/2018	**1,403**	**-**	**1,403**
Comprising:			
Annuities following work-related accident and illness, and invalidity	1,177	-	1,177
Long service awards	197	-	197
Other	29	-	29
PROVISIONS FOR EMPLOYEE BENEFITS AT 31/12/2018	29,201	(11,165)	18,036

At 31 December 2017:

(in millions of euros)	Obligations	Fund assets	Provisions in the balance sheet
Provisions for post-employment benefits at 31/12/2017	**31,214**	**(11,621)**	**19,593**
Comprising:			
Pensions	24,266	(10,859)	13,407
Benefits in kind (electricity/gas)	4,758	-	4,758
Retirement gratuities	873	(747)	126
Other	1,317	(15)	1,302
Provisions for other long-term employee benefits at 31/12/2017	**1,487**	**-**	**1,487**
Comprising:			
Annuities following work-related accident and illness, and invalidity	1,250	-	1,250
Long service awards	208	-	208
Other	29	-	29
PROVISIONS FOR EMPLOYEE BENEFITS AT 31/12/2017	32,701	(11,621)	21,080

31.2.4 Breakdown of obligations by type of beneficiary

(in millions of euros)	**31/12/2018**	31/12/2017
Current employees	16,009	18,577
Retirees	13,192	14,124
OBLIGATIONS	29,201	32,701

31.2.5 Fund assets

For France, fund assets, managed under an asset/liability model, amount to €11,165 million at 31 December 2018 (€11,621 million at 31 December 2017) and concern the coverage of retirement gratuities and the specific benefits of the special pension system.

They consist of insurance contracts with the following risk profile:

- 73% in a hedging pocket consisting of bonds, designed to replicate variations in the obligation caused by changes in interest rates;
- 27% in a growth asset pocket consisting of international equities.

Fund assets break down as follows:

(in millions of euros)	31/12/2018	31/12/2017
FUND ASSETS	11,165	11,621
Assets funding special pension benefits	10,416	10,859
Comprising (%)		
Listed equity instruments (shares)	27%	31%
Listed debt instruments (bonds)	73%	69%
Assets funding retirement gratuities	734	747
Comprising (%)		
Listed equity instruments (shares)	27%	32%
Listed debt instruments (bonds)	73%	68%
Other fund assets	15	15

At 31 December 2018, the equities held as part of fund assets are distributed as follows:

- approximately 58% of the total are shares in North American companies;
- approximately 18% of the total are shares in European companies;
- approximately 24% of the total are shares in companies in the Asia-Pacific zone and emerging countries.

This distribution is relatively stable compared to the distribution at 31 December 2017.

At 31 December 2018, the bonds held as part of fund assets are distributed as follows:

- approximately 93% of the total are AAA and AA-rated bonds;
- approximately 7% of the total are bonds with A, BBB and other ratings.

Around 89% of bonds are sovereign bonds issued by Euro zone countries, and the balance mainly consists of bonds issued by financial and non-financial firms.

This distribution is relatively stable compared to the distribution at 31 December 2017.

The performance of pension fund assets in France is -0.4% in 2018.

31.2.6 Future Cash Flows

Cash flows related to future employee benefits are as follows:

(in millions of euros)	Cash flow under year-end economic conditions	Amount covered by provisions (present value)
Less than one year	1,446	1,430
One to five years	5,202	4,850
Five to ten years	5,175	4,316
More than ten years	39,379	18,605
CASH FLOWS RELATED TO EMPLOYEE BENEFITS	51,202	29,201

At 31 December 2018, the average duration of employee benefit commitments in France is 17.8 years.

31.2.7 Actuarial assumptions

(in %)	31/12/2018	31/12/2017
Discount rate/rate of return on assets [1]	2.30%	1.90%
Inflation rate	1.50%	1.50%
Wage increase rate [2]	2.60%	2.70%

(1) The interest income generated by assets is calculated using the discount rate. The difference between this interest income and the return on assets is recorded in equity.
(2) Average wage increase rate, including inflation and projected over a full career.

In France, the discount rate used for employee benefit obligations is determined by applying the yield rate on high-quality corporate bonds based on their duration to maturities corresponding to the future disbursements resulting from these obligations. For longer durations, the calculation also takes into consideration data from a wider selection of corporate bonds adjusted for comparability with the high-quality bonds, given the smaller panel of bonds with these durations since 2017.

Changes at 31 December 2018 in the economic and market parameters used have led the Group to set the discount rate at 2.30% at 31 December 2018 (1.90% at 31 December 2017).

The inflation rate used to calculate provisions for employee benefits is derived from an internally-determined inflation curve by maturity which is used in the Group as a benchmark for Euro zone countries. The inflation rate determined in this way at 31 December 2018 is an average 1.50% (identical to the rate applied at 31 December 2017).

The mortality table used to calculate obligations is adjusted for specificities of the IEG (gas and electricity sector) system; in 2018 it was updated by using the INSEE 2013-2070 generation table (produced by the French statistics office), instead of the INSEE 2007-2060 generation table.

31.2.8 Sensitivity analysis

Sensitivity analyses on the amount of the obligation are as follows:

(in %)	31/12/2018
Impact of a 25bp increase or decrease in the discount rate	-4.3%/+4.7%
Impact of a 25bp increase or decrease in the inflation rate	+4.4%/-4.1%
Impact of a 25bp increase or decrease in the wage increase rate	+3.8%/-3.5%

31.3 UNITED KINGDOM

The United Kingdom segment chiefly comprises EDF Energy, whose principal employee benefits are described in note 1.3.22.

31.3.1 Details of the change in the net liability

(in millions of euros)	Obligations	Fund assets	Net liability
Balances at 31/12/2017	**8,956**	**(9,684)**	**(728)**
Net expense for 2018	505	(248)	257
Actuarial gains and losses	(518)	463	(55)
Employer's contributions to funds	-	(271)	(271)
Employees' contributions to funds	15	(15)	-
Benefits paid	(644)	644	-
Translation adjustment	(66)	72	6
BALANCES AT 31/12/2018	**8,248**	**(9,039)**	**(791)**
Including:	-	-	-
Provisions for employee benefits	-	-	146
Non-current financial assets	-	-	(937)

At 31 December 2018, EDF Energy's EEGSG and BEGG pension schemes (see note 1.3.22.2.2) were overfunded to the extent of €937 million compared to €910 million at 31 December 2017.

The surplus funding, which has increased due to the good performance by fund assets, is recognised in balance sheet assets as "non-current financial assets".

On 26 October 2018 in the litigation between Lloyds Banking Group Pensions Trustees Limited and Lloyds Bank plc, the High Court of Justice ruled that the minimum guaranteed pension relating to rights vested between May 1990 and April 1997 must be equalised for men and women. Application of this decision to EDF Energy's pension schemes (BEGG and EEGSG) resulted in a €15 million increase in provisions for employee benefits in 2018, with a corresponding entry in other income and expenses.

31.3.2 Post-employment benefit and other long-term employee benefit expenses

(in millions of euros)	2018	2017
Current service cost	(258)	(267)
Past service cost	(15)	-
Actuarial gains and losses – other long-term benefits	-	-
Net expenses recorded as operating expenses	**(273)**	**(267)**
Interest expense (discount effect)	(232)	(244)
Return on fund assets	248	249
Net interest expense included in financial result	**16**	**5**
EMPLOYEE BENEFIT EXPENSES RECORDED IN THE INCOME STATEMENT	(257)	(262)
Actuarial gains and losses – post-employment benefits	518	(194)
Actuarial gains and losses on fund assets	(463)	558
Actuarial gains and losses	**55**	**364**
Translation adjustments	**(6)**	**(17)**
GAINS AND LOSSES ON EMPLOYEE BENEFITS RECORDED DIRECTLY IN EQUITY	49	347

31.3.3 Breakdown of obligations by type of beneficiary

(in millions of euros)	31/12/2018	31/12/2017
Current employees	4,948	5,412
Retirees	3,300	3,544
OBLIGATIONS	8,248	8,956

31.3.4 Fund assets

Pension obligations in the United Kingdom are partly covered by external funds with a present value of €9,039 million at 31 December 2018 (€9,684 million at 31 December 2017).

The investment strategy applied in these funds is a liability driven investment strategy. The allocation between growth and back-to-back is regularly reviewed by the trustees, at least after every actuarial valuation, to ensure that the funds' overall investment strategy remains coherent in order to achieve the target coverage level required.

These assets break down as follows:

(in millions of euros)	31/12/2018	31/12/2017
BEGG pension fund	6,963	7,597
EEGSG pension fund	1,267	1,283
EEPS pension fund	809	804
FUND ASSETS	9,039	9,684
Comprising (%)		
Listed equity instruments (shares)	9%	27%
Listed debt instruments (bonds)	61%	50%
Real estate properties	8%	7%
Cash and cash equivalents	3%	1%
Other	19%	15%

At 31 December 2018, the equities held as part of fund assets are distributed as follows:

- approximately 40% of the total are shares in North American companies;
- approximately 37% of the total are shares in European companies;
- approximately 23% of the total are shares in companies in the Asia-Pacific zone and emerging countries.

At 31 December 2018, the bonds held as part of fund assets are distributed as follows:

- approximately 64% of the total are AAA and AA-rated bonds;
- approximately 36% of the total are bonds with A, BBB and other ratings.

Around 61% of all these bonds are sovereign bonds, mainly issued by the United Kingdom. The balance mainly consists of bonds issued by financial and non-financial firms.

The portion of sovereign bonds issued by the United Kingdom was 2 percentage points lower than at 31 December 2017.

31.3.5 Future cash flows

Cash flows related to future employee benefits are as follows:

(in millions of euros)	Cash flow under year-end economic conditions	Amount covered by provisions (present value)
Less than one year	253	250
One to five years	1,030	975
Five to ten years	1,460	1,241
More than ten years	13,179	5,782
CASH FLOWS RELATED TO EMPLOYEE BENEFITS	15,922	8,248

The contribution to funds for 2019 is estimated at approximately €282 million (€267 million contributed by the employer and €15 million by the employees).

The average weighted duration of funds in the United Kingdom is 19.6 years at 31 December 2018.

31.3.6 Actuarial assumptions

(in %)	31/12/2018	31/12/2017
Discount rate/rate of return on assets [1]	2.86%	2.56%
Inflation rate	2.99%	3.00%
Wage increase rate	2.39%	2.40%

(1) The interest income generated by assets is calculated using the discount rate. The difference between this interest income and the return on assets is recorded in equity.

In the United Kingdom, the discount rate used for employee benefit obligations is determined by applying the yield rate on high-quality non-financial corporate bonds based on their duration to maturities corresponding to the future disbursements resulting from these obligations.

31.3.7 Sensitivity analyses

Sensitivity analyses on the amount of the obligations are as follows:

(in %)	31/12/2018
Impact of a 25bp increase or decrease in the discount rate	-4.7%/+4.9%
Impact of a 25bp increase or decrease in the inflation rate	+3.5%/-3.3%
Impact of a 25bp increase or decrease in the wage increase rate	+0.5%/-0.5%

NOTE 32 OTHER PROVISIONS

Details of changes in other provisions are as follows:

(in millions of euros)	31/12/2017	Increases	Decreases		Changes in scope	Other Changes	31/12/2018
			Utilisations	Reversals			
Provisions for contingencies related to subsidiaries and investments	913	184	(38)	(1)	-	(124)	934
Provisions for tax liabilities	573	36	(126)	(43)	-	8	448
Provisions for litigation	589	43	(34)	(40)	-	4	562
Provisions for onerous contracts and losses on completion [1]	273	923	(94)	(47)	-	153	1,208
Provisions related to environmental schemes [2]	901	1,448	(1,200)	(3)	-	(9)	1,137
Other provisions for risks and liabilities [3]	1,636	730	(459)	(183)	4	(5)	1,723
TOTAL	4,885	3,364	(1,951)	(317)	4	27	6,012

(1) The increase in provisions for onerous contracts is mainly attributable to the long-term contract with Dunkerque LNG (see note 3.3).
(2) Provisions related to environmental schemes include provisions for greenhouse gas emission rights and renewable energy certificates (see note 49).
(3) These provisions cover various contingencies and expenses related to operations (employers' matching contributions to employee profit sharing, contractual maintenance obligations, etc). None of these provisions is significant individually.

NOTE 33 SPECIAL FRENCH PUBLIC ELECTRICITY DISTRIBUTION CONCESSION LIABILITIES

The changes in special concession liabilities for existing assets and assets to be replaced are as follows:

(in millions of euros)	31/12/2018	31/12/2017
Value in kind of assets [1]	49,327	47,813
Unamortised financing by the operator	(25,669)	(24,172)
Rights in existing assets –net value	**23,658**	**23,641**
Amortisation of financing by the grantor	13,792	13,149
Provisions for renewal	9,474	9,533
Rights in assets to be replaced	**23,266**	**22,682**
SPECIAL FRENCH PUBLIC ELECTRICITY DISTRIBUTION CONCESSION LIABILITIES	46,924	46,323

(1) Including contributions received to finance concession assets, amounting to €131 million (€144 million in 2017).

NOTE 34 TRADE PAYABLES

(in millions of euros)	31/12/2018	31/12/2017
Trade payables – excluding EDF Trading	11,177	10,738
Trade payables – EDF Trading	2,244	3,256
TRADE PAYABLES	13,421	13,994

The Group has a reverse factoring programme allowing suppliers to transfer their receivables on EDF to a factoring company, at their own initiative.

For the Group, this programme does not cause any change in the substance and features of the receivables held by suppliers on EDF. In particular it does not affect the sequences of operating cash flows. The associated liabilities are therefore included in "trade payables" in the Group's financial statements.

NOTE 35 OTHER LIABILITIES

Details of other liabilities are as follows:

(in millions of euros)	31/12/2018	31/12/2017 restated (1)
Advances and progress payments received	1,920	1,819
Liabilities related to property, plant and equipment	3,757	3,711
Tax liabilities	4,624	4,672
Social charges	4,388	4,171
Deferred income on long-term contracts	3,413	3,606
Other deferred income	609	499
Other	2,198	2,436
OTHER LIABILITIES	20,908	20,914
Non-current portion	4,896	4,864
Current portion	16,012	16,050

(1) The published figures at 31 December 2017 have been restated according to IFRS 15 (note 2.1.3.2).

35.1 ADVANCES AND PROGRESS PAYMENTS RECEIVED

Advances and progress payments received comprise €679 million of payments made by the customers in Framatome's long-term contracts (€738 million at 31 December 2017).

35.2 TAX LIABILITIES

At 31 December 2018, tax liabilities mainly include an amount of €659 million for the CSPE to be collected by EDF on energy supplied but not yet billed, less the CSPE collected on advances from customers who pay in regular monthly instalments (€711 million at 31 December 2017).

35.3 DEFERRED INCOME ON LONG-TERM CONTRACTS

EDF's deferred income on long-term contracts at 31 December 2018 comprises €1,663 million (€1,711 million at 31 December 2017) of partner advances made to EDF under the nuclear plant financing plans.

Deferred income on long-term contracts also includes an advance of €1.7 billion paid to the EDF group in 2010 under the agreement with the Exeltium consortium. This advance is transferred to the income statement progressively over the term of the contract (24 years).

35.4 OTHER ITEMS

The "Other" line of the table includes investment subsidies received during 2018, amounting to €351 million (€348 million in 2017).

35.5 CONTRACT LIABILITIES

Contract liabilities represent an entity's obligations to provide customers with goods or services for which it has already been paid, or for which payment is due.

These liabilities consist of practically all the advances and progress payments received, amounting to €1,858 million (principally concerning the Framatome, United Kingdom and France – Regulated Activities

segments), and practically all the deferred income (on long-term and other contracts), amounting to €3,990 million (principally concerning the France – Generation and Supply segment). They thus total €5,848 million at 31 December 2018 (€5,876 million at 31 December 2017).

Contracts expiring in more than one year on which obligations are unfulfilled or partially fulfilled at the reporting date should generate sales revenues of approximately €12,852 million which have not yet been recognised. €1,400 million of these sales revenues will be recognised progressively until 2034 on the Exeltium contract, and the balance will be recognised over the operating period for contracts relating to jointly-operated power plants, and over the term of the contract for other firm sale contracts (excluding energy sales).

NOTE 36 CURRENT AND NON-CURRENT FINANCIAL ASSETS

36.1 BREAKDOWN BETWEEN CURRENT AND NON-CURRENT FINANCIAL ASSETS

Current and non-current financial assets break down as follows:

	31/12/2018			31/12/2017		
(in millions of euros)	Current	Non-current	**Total**	Current	Non-current	**Total**
Instruments at fair value through OCI with recycling	17,659	5,279	**22,938**	-	-	**-**
Instruments at fair value through OCI with no recycling	6	407	**413**	-	-	**-**
Instruments at fair value through profit and loss	3,175	16,985	**20,160**	-	-	**-**
Available-for-sale financial assets	-	-	**-**	19,312	21,612	**40,924**
Debt and equity securities	***20,840***	***22,671***	***43,511***	***19,312***	***21,612***	***40,924***
Trading derivatives – Positive fair value in profit and loss	6,404	-	**6,404**	2,614	-	***2,614***
Hedging derivatives – Positive fair value in profit and loss	1,646	2,737	**4,383**	837	2,743	**3,580**
Loans and financial receivables [1]	2,253	11,696	**13,949**	2,190	12,432	**14,622**
CURRENT AND NON-CURRENT FINANCIAL ASSETS	31,143	37,104	68,247	24,953	36,787	61,740

(1) Including impairment of €(281) million at 31 December 2018 (€(189) million at 31 December 2017).

36.2 DEBT AND EQUITY SECURITIES

Details of debt and equity securities are shown in the table below.

	31/12/2018				31/12/2017
(in millions of euros)	At fair value through OCI with recycling	At fair value through OCI with no recycling (IFRS 9)	At fair value through profit and loss	Total	At fair value through OCI with recycling (IAS 39)
Debt and equity securities					
EDF dedicated assets	5,292	-	16,528	**21,820**	20,848
Liquid assets	17,575	-	2,963	**20,538**	18,963
Other securities [1]	71	413	669	**1,153**	1,113
TOTAL	22,938	413	20,160	43,511	40,924

(1) Investments in non-consolidated companies, principally EDF Invest.

Information on EDF's dedicated assets is given in note 45.

Changes in the fair value of debt and equity securities were recorded in equity (EDF share) over the period as follows:

	2018 (IFRS 9)			2017 (IAS 39)	
(in millions of euros)	Gross changes in fair value recorded in OCI with no recycling [1]	Gross changes in fair value recorded in OCI with recycling [1]	Gross changes in fair value recycled to profit and loss [2]	Gross changes in fair value recorded in equity [1]	Gross changes in fair value recycled to profit and loss [2]
EDF dedicated assets	-	(72)	(12)	807	673
Liquid assets	-	(43)	12	22	34
Other assets	(37)	-	-	(5)	10
DEBT AND EQUITY SECURITIES [3]	**(37)**	**(115)**	**-**	**824**	**717**

(1) + / ( ): increase / (decrease) in equity (EDF share).
(2) + / ( ): increase / (decrease) in income (EDF share).
(3) Excluding associates and joint ventures.

In 2018, gross changes in fair value recorded in OCI with recycling principally concern EDF (€(115) million, including €(60) million for dedicated assets).

In 2017, gross changes in fair value principally concerned EDF (€107 million, including €134 million for dedicated assets).

No significant impairment was recorded in 2018.

36.2.1 Dedicated assets

Diversified bond investments and equities included in EDF's dedicated assets are recorded as "debt and equity securities". The general management policy for dedicated assets is presented in note 45.

36.2.2 Liquid assets

Liquid assets are financial assets consisting of funds or interest rate instruments with initial maturity of over three months that are readily convertible into cash, and are managed according to a liquidity-oriented policy.

EDF's monetary UCITS, included in liquid assets, amount to €2,863 million at 31 December 2018 (€2,646 million at 31 December 2017).

36.3 LOANS AND FINANCIAL RECEIVABLES

Loans and financial receivables consist of the following:

(in millions of euros)	31/12/2018	31/12/2017
Loans and financial receivables – amounts receivable from the NLF	9,220	8,650
Loans and financial receivables – CSPE [1]	2,060	3,294
Loans and financial receivables – other	2,669	2,678
LOANS AND FINANCIAL RECEIVABLES	**13,949**	**14,622**

(1) Including €2,060 million allocated to dedicated assets at 31 December 2018 (€3,294 million at 31 December 2017).

At 31 December 2018 loans and financial receivables mainly include:

- amounts representing reimbursements receivable from the NLF and the British government for coverage of long-term nuclear obligations, totalling €9,220 million at 31 December 2018 (€8,650 million at 31 December 2017), discounted at the same rate as the provisions they finance;
- the receivable corresponding to the balance of the shortfall in the Contribution to the Public Electricity Service (CSPE) at 31 December 2017 and the costs of bearing that shortfall. Reimbursements of principal and interest during 2018 amounted to €1,281 million, in line with the schedule published in the

ministerial orders of 13 May 2016 and 2 December 2016, made in application of Article R. 121-31 of the French Energy Code. This CSPE receivable is allocated in its entirety to dedicated assets.

36.4 CHANGE IN FINANCIAL ASSETS OTHER THAN DERIVATIVES

The variation in financial assets is as follows:

36.4.1 At 31 December 2018

(in millions of euros)	31/12/2017 restated	Change of method	Net variations	Changes in fair value	Discount effect	Changes in scope	Translation adjustments	Other	31/12/2018
Available-for-sale financial assets	**40,924**	(40,924)	-	-	-	-	-	-	**-**
Instruments at fair value through OCI with recycling	**-**	20,828	2,060	(102)	-	-	112	40	**22,938**
Instruments at fair value through OCI with no recycling	**-**	444	(9)	(37)	-	7	-	8	**413**
Instruments at fair value through profit and loss	**-**	19,652	1,489	(847)	-	(6)	-	(128)	**20,160**
Loans and financial receivables	**14,622**	-	(1,362)	-	460	(34)	(96)	359	**13,949**

The net decrease in loans and financial receivables includes the €(1,234) million change in the CSPE receivable.

Other changes in loans and financial receivables consist of the €404 million change in the receivable corresponding to amounts reimbursable by the NLF and the British government for coverage of long-term nuclear obligations, and the change in the financial asset reflecting the overfunding of EDF Energy's EEGSG and BEGG pension plans (€937 million at 31 December 2018, compared to €916 million at 31 December 2017).

36.4.2 At 31 December 2017

(in millions of euros)	31/12/2016	Net variations	Changes in fair value	Discount effect	Changes in scope	Translation adjustments	Other	31/12/2017
Available-for-sale financial assets	**40,290**	344	588	-	144	(137)	(305)	**40,924**
Loans and financial receivables	**14,956**	(979)	-	442	174	(377)	406	**14,622**

NOTE 37 CASH AND CASH EQUIVALENTS

Cash and cash equivalents comprise cash in hand and at bank and investments in money market instruments. Cash and cash equivalents as stated in the cash flow statements include the following amounts recorded in the balance sheet:

(in millions of euros)	31/12/2018	31/12/2017
Cash	2,855	3,328
Cash equivalents (1)	435	364
Financial current accounts	-	-
CASH AND CASH EQUIVALENTS	3,290	3,692

(1) Items stated at fair value amount to €435 million at 31 December 2018 (€364 million at 31 December 2017).

Cash restrictions

Cash and cash equivalents include €235 million of cash subject to restrictions at 31 December 2018 (€298 million at 31 December 2017) (see note 1.3.26).

NOTE 38 CURRENT AND NON-CURRENT FINANCIAL LIABILITIES

38.1 BREAKDOWN BETWEEN CURRENT AND NON-CURRENT FINANCIAL LIABILITIES

Current and non-current financial liabilities break down as follows:

	31/12/2018			31/12/2017		
(in millions of euros)	Non-current	Current	**Total**	Non-current	Current	**Total**
Loans and other financial liabilities	50,901	8,287	**59,188**	49,734	7,112	**56,846**
Negative fair value of derivatives held for trading	-	7,160	**7,160**	-	2,787	**2,787**
Negative fair value of hedging derivatives	1,228	1,720	**2,948**	1,631	1,243	**2,874**
FINANCIAL LIABILITIES	52,129	17,167	69,296	51,365	11,142	62,507

38.2 LOANS AND OTHER FINANCIAL LIABILITIES

38.2.1 Changes in loans and other financial liabilities

(in millions of euros)	Bonds	Loans from financial institutions	Other financial liabilities	Loans related to finance-leased assets	Accrued Interest	**Total**
Balances at 31/12/2017	**47,325**	**3,094**	**4,725**	**368**	**1,334**	**56,846**
Increases	4,259	1,269	183	-	179	5,890
Decreases	(1,621)	(265)	(989)	(55)	(154)	(3,084)
Translation adjustments	(47)	(28)	48	-	1	(26)
Changes in scope of consolidation	(49)	(976)	(41)	7	(11)	(1,070)
Changes in fair value	534	-	161	2	-	697
Other changes	-	4	(61)	2	(10)	(65)
BALANCES AT 31/12/2018	50,401	3,098	4,026	324	1,339	59,188

The increases/decreases in loans and other financial liabilities (excluding accrued interest) shown in the above table do not include monetary variations of €86 million on settlement of hedging instruments (these variations are included in the cash flow statement).

Loans and other financial liabilities of the Group's main entities are as follows:

(in millions of euros)	**31/12/2018**	31/12/2017
EDF and other related subsidiaries [(1)]	48,650	44,367
EDF Energy [(2)]	3,345	6,118
EDF Renewables	5,741	5,276
Edison [(3)]	549	241
Other	903	844
LOANS AND OTHER FINANCIAL LIABILITIES	59,188	56,846

(1) Enedis, EDF PEI, EDF International, EDF Holding SAS, C3 and EDF Investissements Groupe.
(2) Including holding companies.
(3) Edison excluding TdE SpA.

At 31 December 2018, none of these entities had defaulted on any borrowing.

The Group's principal borrowings at 31 December 2018 are as follows:

Type of borrowing *(in millions of currencies)*	Entity	Issue [1]	Maturity	Issue amount	Currency	Rate
Bond	EDF	01/2009	01/2019	2,000	USD	6.50%
Bond	EDF	01/2014	01/2019	1,250	USD	2.15%
Bond	EDF	01/2010	01/2020	1,400	USD	4.60%
Euro MTN	EDF	05/2008	05/2020	1,200	EUR	5.38%
Bond	EDF	10/2015	10/2020	1,500	USD	2.35%
Euro MTN	EDF	01/2009	01/2021	2,000	EUR	6.25%
Euro MTN (green bond)	EDF	11/2013	04/2021	1,400	EUR	2.25%
Euro MTN	EDF	01/2012	01/2022	2,000	EUR	3.88%
Euro MTN	EDF	09/2012	03/2023	2,000	EUR	2.75%
Euro MTN	EDF	09/2009	09/2024	2,500	EUR	4.63%
Bond (green bond)	EDF	10/2015	10/2025	1,250	USD	3.63%
Euro MTN	EDF	11/2010	11/2025	750	EUR	4.00%
Euro MTN (green bond)	EDF	10/2016	10/2026	1,750	EUR	1.00%
Bond	EDF	01/2017	01/2027	107,900	JPY	1.09%
Euro MTN	EDF	03/2012	03/2027	1,000	EUR	4.13%
Bond	EDF	09/2018	09/2028	1,800	USD	4.50%
Euro MTN	EDF	04/2010	04/2030	1,500	EUR	4.63%
Euro MTN	EDF	10/2018	10/2030	1,000	EUR	2.00%
Euro MTN	EDF	07/2001	07/2031	650	GBP	5.88%
Euro MTN	EDF	02/2003	02/2033	850	EUR	5.63%
Euro MTN	EDF	06/2009	06/2034	1,500	GBP	6.13%
Euro MTN	EDF	10/2016	10/2036	750	EUR	1.88%
Bond	EDF	09/2018	09/2038	650	USD	4.88%
Bond	EDF	01/2009	01/2039	1,750	USD	6.95%
Euro MTN	EDF	11/2010	11/2040	750	EUR	4.50%
Euro MTN	EDF	10/2011	10/2041	1,250	GBP	5.50%
Bond	EDF	01/2014	01/2044	1,000	USD	4.88%
Bond	EDF	10/2015	10/2045	1,500	USD	4.75%
Bond	EDF	10/2015	10/2045	1,150	USD	4.95%
Bond	EDF	09/2018	09/2048	1,300	USD	5,00%
Euro MTN	EDF	09/2010	09/2050	1,000	GBP	5.13%
Euro MTN	EDF	10/2016	10/2056	2,164	USD	4.99%
Bond	EDF	01/2014	01/2114	1,350	GBP	6.00%

(1) Date funds were received.

On 19 and 25 September 2018, EDF raised respectively USD3.75 billion through a multi-tranche US Dollar senior bond, and €1 billion through a senior bond (see note 3.4).

At 31 December 2018, the total ceiling on EDF's EMTN (Euro Medium Term Notes) programme, allowing issuance of borrowings under the programme, is €45 billion.

38.2.2 Maturity of loans and other financial liabilities

At 31 December 2018:

(in millions of euros)	Bonds	Loans from financial institutions	Other financial liabilities	Loans related to finance-leased assets	Accrued Interest	Total
Less than one year	3,316	464	3,382	45	1,080	**8,287**
From one to five years	11,908	650	81	111	39	**12,789**
More than five years	35,177	1,984	563	168	220	**38,112**
LOANS AND OTHER FINANCIAL LIABILITIES AT 31/12/2018	**50,401**	**3,098**	**4,026**	**324**	**1,339**	**59,188**

At 31 December 2017:

(in millions of euros)	Bonds	Loans from financial institutions	Other financial liabilities	Loans related to finance-leased assets	Accrued Interest	Total
Less than one year	1,557	549	3,881	52	1,073	**7,112**
From one to five years	13,021	653	50	147	71	**13,942**
More than five years	32,747	1,892	794	169	190	**35,792**
LOANS AND OTHER FINANCIAL LIABILITIES AT 31/12/2017	**47,325**	**3,094**	**4,725**	**368**	**1,334**	**56,846**

38.2.3 Breakdown of loans and other financial liabilities by currency

	31/12/2018			31/12/2017		
(in millions of euros)	Initial debt structure	Impact of hedging instruments (1)	Debt structure after hedging	Initial debt structure	Impact of hedging instruments (1)	Debt structure after hedging
Euro (EUR)	26,783	21,438	48,221	27,609	18,454	46,063
American dollar (USD)	20,546	(17,564)	2,982	17,224	(14,752)	2,472
Pound sterling (GBP)	9,250	(2,414)	6,836	9,495	(2,331)	7,164
Other	2,609	(1,460)	1,149	2,518	(1,371)	1,147
LOANS AND OTHER FINANCIAL LIABILITIES	**59,188**	**-**	**59,188**	**56,846**	**-**	**56,846**

(1) Hedges of liabilities and net assets of foreign subsidiaries

38.2.4 Breakdown of loans and other financial liabilities by type of interest rate

	31/12/2018			31/12/2017		
(in millions of euros)	Initial debt structure	Impact of derivatives	Final debt structure	Initial debt structure	Impact of derivatives	Final debt structure
Fixed rates	55,810	(21,949)	33,861	52,900	(21,469)	31,431
Floating rates	3,378	21,949	25,327	3,946	21,469	25,415
LOANS AND OTHER FINANCIAL LIABILITIES	**59,188**	**-**	**59,188**	**56,846**	**-**	**56,846**

The breakdown of loans and financial liabilities by interest rate includes the impact of all derivatives classified as hedges in accordance with IFRS 9.

A large portion of the EDF group's fixed-rate loans is swapped to variable rates.

38.2.5 Credit lines

At 31 December 2018, the Group has unused credit lines with various banks totalling €11,393 million (€11,943 million at 31 December 2017). These amounts include a €4 billion syndicated revolving credit facility which was modified and renewed on 14 December 2018 (see note 3.7).

	31/12/2018				31/12/2017
	Total	Maturity			Total
(in millions of euros)		< 1 year	1-5 years	> 5 years	
CONFIRMED CREDIT LINES	11,393	3,166	8,142	85	11,943

38.2.6 Early repayment clauses

Project financing loans to EDF Renewables from non-Group parties generally include early repayment clauses, mainly applicable when the borrower fails to maintain a minimum Debt Service Coverage Ratio (DSCR). In general, early repayment clauses are activated when this ratio falls below 1.

In other Group entities, certain clauses contained in contracts for financing or other commitments may make reference to Group ratings, but are not classified as covenants.

Two borrowings with a combined total of €725 million contain a review clause stipulating that if the borrower's rating falls below a certain level, the borrower and the lender must review and possibly renegotiate the terms of the loan, and the borrower may voluntarily proceed to early repayment.

No early repayment took place in 2018 as a result of any Group entity's failure to comply with contractual clauses concerning loans.

38.3 NET INDEBTEDNESS

Net indebtedness is not defined in the accounting standards and is not directly presented in the consolidated balance sheet. It comprises total loans and financial liabilities, less cash and cash equivalents and liquid assets. Liquid assets are financial assets consisting of funds or interest rate instruments with initial maturity of over three months that are readily convertible into cash and are managed according to a liquidity-oriented policy.

(in millions of euros)	Notes	31/12/2018	31/12/2017
Loans and other financial liabilities	38.2.1	59,188	56,846
Derivatives used to hedge liabilities	41	(1,972)	(1,176)
Cash and cash equivalents	37	(3,290)	(3,692)
Debt and equity securities – liquid assets	36.2.2	(20,538)	(18,963)
Net indebtedness of assets held for sale		-	-
NET INDEBTEDNESS		33,388	33,015

NOTE 39 OTHER INFORMATION ON FINANCIAL ASSETS AND LIABILITIES

39.1 FAIR VALUE OF FINANCIAL INSTRUMENTS

The following tables show the breakdown of financial assets and liabilities in the balance sheet, by level.

39.1.1 At 31 December 2018

(in millions of euros)	Balance sheet value	Fair value	Level 1 Unadjusted quoted prices	Level 2 Observable data	Level 3 Non-observable data
Financial assets at fair value through profit and loss [1]	6,404	6,404	569	5,497	338
Debt and equity securities	43,511	43,511	2,442	40,470	599
Positive fair value of hedging derivatives	4,383	4,383	68	4,315	-
Cash equivalents carried at fair value	435	435	181	254	-
Financial assets carried at fair value in the balance sheet	**54,733**	**54,733**	**3,260**	**50,536**	**937**
Loans and financial receivables – assets receivable from the NLF	9,220	9,220	-	9,220	-
Loans and financial receivables – CSPE	2,060	2,080	-	2,080	-
Other loans and financial receivables	2,669	2,669	-	2,669	-
Financial assets carried at amortised cost	**13,949**	**13,969**	**-**	**13,969**	**-**
Negative fair value of hedging derivatives	2,948	2,948	96	2,852	-
Negative fair value of trading derivatives	7,160	7,160	554	6,274	332
Financial liabilities carried at fair value in the balance sheet	**10,108**	**10,108**	**650**	**9,126**	**332**
Loans and other financial liabilities [2]	59,188	63,772	-	63,772	-
Financial liabilities carried at amortised cost	**59,188**	**63,772**	**-**	**63,772**	**-**

(1) Including €6,404 million for the positive fair value of trading derivatives.
(2) Loans and other financial liabilities are carried in the balance sheet at amortised cost, adjusted for changes in the fair value of risks covered by a fair value hedge.

Level 3 debt and equity securities are principally non-consolidated investments.

Cash equivalents, which principally take the form of negotiable debt instruments and short-term investments, are generally valued using yield curves, and therefore observable market data.

39.1.2 At 31 December 2017

(in millions of euros)	Balance sheet value	Fair value	Level 1 Unadjusted quoted prices	Level 2 Observable data	Level 3 Non-observable data
Financial assets carried at fair value with changes in fair value included in income [1]	2,614	2,614	233	2,252	129
Debt and equity securities	40,924	40,924	2,499	37,792	633
Positive fair value of hedging derivatives	3,580	3,580	21	3,559	-
Cash equivalents carried at fair value	364	364	198	166	-
Financial assets carried at fair value in the balance sheet	**47,482**	**47,482**	**2,951**	**43,769**	**762**
Loans and financial receivables – Assets receivable from the NLF	8,650	8,650	-	8,650	-
Loans and financial receivables– CSPE	3,294	3,349	-	3,349	-
Other loans and financial receivables	2,678	2,678	-	2,678	-
Financial assets recorded at amortised cost	**14,622**	**14,677**	**-**	**14,677**	**-**
Negative fair value of hedging derivatives	2,874	2,874	75	2,799	-
Negative fair value of trading derivatives	2,787	2,787	200	2,467	120
Financial liabilities carried at fair value in the balance sheet	**5,661**	**5,661**	**275**	**5,266**	**120**
Loans and other financial liabilities [2]	56,846	63,334	-	63,334	-
Financial liabilities recorded at amortised cost	**56,846**	**63,334**	**-**	**63,334**	**-**

(1) Including €2,614 million for the positive fair value of trading derivatives.
(2) Loans and other financial liabilities are carried in the balance sheet at amortised cost, adjusted for changes in the fair value of risks covered by a fair value hedge.

39.2 OFFSETTING OF FINANCIAL ASSETS AND LIABILITIES

39.2.1 At 31 December 2018

(in millions of euros)	As reported in balance sheet	Balance without offsetting	Balance with offsetting under IAS 32			Amounts covered by a general offsetting agreement but not offset under IAS 32		
			Gross amount recognised (before offsetting)	Gross amount offset under IAS 32	Net amount recognised after offsetting under IAS 32	Financial instruments	Fair value of financial collateral	Net amount
Fair value of derivatives – assets	**10,787**	**218**	16,481	(5,912)	**10,569**	(1,711)	(960)	**7,898**
Fair value of derivatives – liabilities	**(10,108)**	**(848)**	(15,172)	5,912	**(9,260)**	1,711	959	**(6,590)**

39.2.2 At 31 December 2017

(in millions of euros)	As reported in balance sheet	Balance without offsetting	Balance with offsetting under IAS 32			Amounts covered by a general offsetting agreement but not offset under IAS 32		
			Gross amount recognised (before offsetting)	Gross amount offset under IAS 32	**Net amount recognised after offsetting under IAS 32**	Financial instruments	Fair value of financial collateral	**Net amount**
Fair value of derivatives – assets	**6,194**	**234**	11,067	(5,107)	**5,960**	(1,652)	(1,073)	**3,235**
Fair value of derivatives – liabilities	**(5,661)**	**(844)**	(9,924)	5,107	**(4,817)**	1,652	768	**(2,397)**

NOTE 40 MANAGEMENT OF MARKET AND COUNTERPARTY RISKS

As an operator in the energy sector worldwide, the EDF group is exposed to financial market risks, energy market risks and counterparty risks. All these risks could generate volatility in the financial statements.

- **Financial market risks**

  The main financial market risks to which the Group is exposed are the liquidity risk, the foreign exchange risk, the interest rate risk and the equity risk.

  The objective of the Group's liquidity risk management is to seek resources at optimum cost and ensure their constant accessibility.

  The foreign exchange risk relates to the diversification of the Group's businesses and geographical locations, and results from exposure to the risk of exchange rate fluctuations. These fluctuations can affect the Group's translation differences, balance sheet items, financial expenses, equity and net income.

  The interest rate risk results from exposure to the risk of fluctuations in interest rates that can affect the value of assets invested by the Group, the value of the liabilities covered by provision, or its financial expenses.

  The Group is exposed to equity risks, particularly through its dedicated asset portfolio held for secure financing of long-term nuclear commitments, through external pension funds, and to a lesser extent through its cash assets and directly-held investments.

  A more detailed description of these risks can be found in section 5.1.6.1 of the Reference Document, "Financial Information – Management and control of financial risks".

- **Energy market risks**

  With the opening of the final customer market, development of the wholesale markets and international business expansion, the EDF group operates on deregulated energy markets, mainly in Europe, through its generation and supply activities. This exposes the Group to price variations on the wholesale markets for energy (electricity, gas, coal, oil products) and the CO_2 emissions quota market, with a potentially significant impact on the financial statements.

  A more detailed description of these risks can be found in section 5.1.6.2 of the Reference Document, "Financial Information – Management and control of energy market risks".

- **Counterparty risks**

  Counterparty risk is defined as the total loss that the EDF group would sustain on its business and market transactions if a counterparty defaulted and failed to perform its contractual obligations.

  A more detailed description of these risks can be found in section 5.1.6.1.7 of the Reference Document, "Financial Information – Management and control of counterparty/credit risks".

Regarding the customer risk, which is another component of the counterparty risk, a statement of receivables not yet due and overdue is shown in note 25.

The sensitivity analyses required by IFRS 7 are presented in section 5.1.6.1 of the Reference Document, "Financial Information – Management and control of financial risks":

- Foreign exchange risks: section 5.1.6.1.3;
- Interest rate risks: section 5.1.6.1.4;
- Equity risk on financial assets: sections 5.1.6.1.5 and 5.1.6.1.6.

The principal information on financial assets and liabilities is described by theme in the following notes and sections:

- Liquidity risks:
  - maturity of loans and other financial liabilities: note 38.2.2 to the consolidated financial statements;
  - credit lines: note 38.2.5 to the consolidated financial statements;
  - early repayment clauses for borrowings: note 38.2.6 to the consolidated financial statements;
  - off-balance sheet commitments: note 46 to the consolidated financial statements.
- Foreign exchange risks:
  - breakdown of loans by currency and type of interest rate: notes 38.2.3 and 38.2.4 to the consolidated financial statements.
- Equity risks (sections 5.1.6.1.5 and 5.1.6.1.6 of the Reference Document, "Financial Information Management of equity risks/Management of financial risk on EDF's dedicated asset portfolio"):
  - coverage of nuclear obligations: notes 46 and 29.1.5 to the consolidated financial statements;
  - coverage of social obligations: notes 31.2.5 and 31.3.4 to the consolidated financial statements;
  - long-term cash management;
  - direct investments.
- Interest rate risks:
  - discount rate for nuclear provisions: calculation method and sensitivity: note 29.1.5.2 to the consolidated financial statements;
  - discount rate used for employee benefits: notes 31.2.7 and 31.3.6 to the consolidated financial statements;
  - breakdown of loans by currency and interest rate: notes 38.2.3 and 38.2.4 to the consolidated financial statements.
- Balance sheet treatment of financial and market risks:
  - derivatives and hedge accounting: note 41 to the consolidated financial statements, and the statement of changes in equity;
  - derivatives not classified as hedges: note 42 to the consolidated financial statements.

NOTE 41 DERIVATIVES AND HEDGE ACCOUNTING

Hedge accounting is applied in compliance with IFRS 9, and concerns interest rate derivatives used to hedge long-term indebtedness, currency derivatives used to hedge net foreign investments and debts in foreign currencies, and currency and commodity derivatives used to hedge future cash flows.

The fair value of hedging derivatives reported in the balance sheet breaks down as follows:

(in millions of euros)	Notes	31/12/2018	31/12/2017
Positive fair value of hedging derivatives	36.1	4,383	3,580
Negative fair value of hedging derivatives	38.1	(2,948)	(2,874)
FAIR VALUE OF HEDGING DERIVATIVES		1,435	706
Interest rate hedging derivatives	41.4.1	1,550	1,689
Exchange rate hedging derivatives	41.4.2	582	(606)
Commodity-related cash flow hedges	41.4.3	(645)	(411)
Commodity-related fair value hedges	41.5	(52)	34

An alternative breakdown of hedging derivatives is shown below:

(*in millions of euros*)	Notes	31/12/2018	31/12/2017
Fair value of derivatives hedging liabilities	38.3	1 972	1,176
Fair value of derivatives hedging net foreign investments		106	90
Fair value of other hedging derivatives (commodities)		(643)	(560)
Fair value of hedging derivatives		1,435	706

41.1 FAIR VALUE HEDGES

The EDF group hedges the exposure to changes in the fair value of fixed-rate debts. The derivatives used for this hedging are fixed/floating interest rate swaps and cross currency swaps, with changes in fair value recorded in the income statement. Fair value hedges also include currency hedging instruments on certain firm purchase commitments.

In 2018, the ineffective portion of fair value hedges represents a loss of €(3) million (gain of 37 million in 2017), included in the financial result.

41.2 CASH FLOW HEDGES

The EDF group uses cash flow hedging principally for the following purposes:

- to hedge its floating-rate debt, using interest-rate swaps (floating/fixed rate);
- to hedge the exchange rate risk related to debts contracted in foreign currencies, using cross currency swaps;
- to hedge future cash flows related to expected sales and purchases of electricity, gas, and coal, using futures, forwards and swaps.

The EDF group also hedges the currency risk associated with fuel and commodity purchases.

The ineffective portion of cash flow hedges in 2018 represents a gain of €5 million which was included in the financial result (nil in 2017).

41.3 HEDGES OF NET INVESTMENTS IN FOREIGN ENTITIES

Hedging of net foreign investments is used for protection against exposure to the exchange rate risk related to net investments in the Group's foreign entities.

This risk is hedged at Group level either by contracting debts for investments in the same currency, or through the markets, in which case the Group uses currency swaps and forward exchange contracts.

41.4 IMPACT OF HEDGING DERIVATIVES ON EQUITY

Changes during the period in the fair value of hedging instruments included in equity (EDF share) are detailed below:

	2018			2017		
(in millions of euros)	Gross changes in fair value recorded in equity [1]	Gross changes in fair value transferred to income - Recycling [2]	Gross changes in fair value transferred to income - Ineffectiveness	Gross changes in fair value recorded in equity [1]	Gross changes in fair value transferred to income – Recycling [2]	Gross changes in fair value transferred to income - Ineffectiveness
Interest rate hedging	(73)	-	1	31	-	-
Exchange rate hedging	890	443	(5)	(1,588)	(1,331)	(3)
Net foreign investment hedging	(85)	-	-	518	(120)	-
Commodity hedging	(1,043)	(788)	(9)	(613)	(1,714)	5
HEDGING DERIVATIVES [3]	**(311)**	**(345)**	**(13)**	**(1,652)**	**(3,165)**	**2**

(1) +/( ): increase/(decrease) in equity (EDF share).
(2) +/( ): increase/(decrease) in net income (EDF share).
(3) Excluding associates and joint ventures.

41.4.1 Interest rate hedging derivatives

Interest rate hedging derivatives break down as follows:

	Notional at 31/12/2018				Notional at 31/12/2017	Fair value	
(in millions of euros)	< 1 year	1-5 years	> 5 years	**Total**	Total	**31/12/2018**	31/12/2017
Fixed rate payer/floating rate receiver	118	815	235	1,168	1,148	(75)	(75)
Floating rate payer/fixed rate receiver	-	5,634	17,509	23,143	22,740	1,619	1,928
Floating rate/floating rate	-	1,415	1,616	3,031	1,252	56	(9)
Fixed rate/fixed rate	4,901	1,654	7,498	14,053	10,062	(50)	(155)
Interest rate swaps	**5,019**	**9,518**	**26,858**	**41,395**	**35,202**	**1,550**	**1,689**
INTEREST RATE HEDGING DERIVATIVES	**5,019**	**9,518**	**26,858**	**41,395**	**35,202**	**1,550**	**1,689**

The fair value of interest rate/exchange rate cross-currency swaps comprises the interest rate effect only.

The notional value of cross-currency swaps is included both in this note and the note on Exchange rate hedging derivatives (41.4.2).

A large portion of the EDF group's fixed-rate loans is swapped to variable rates.

41.4.2 Exchange rate hedging derivatives

Exchange rate hedging derivatives break down as follows:

At 31 December 2018:

	Notional amount to be received at 31/12/2018				Notional amount to be given at 31/12/2018				Fair value
(in millions of euros)	< 1 year	1-5 years	> 5 years	**Total**	< 1 year	1-5 years	> 5 years	**Total**	**31/12/2018**
Forward exchange transactions	1,550	393	-	1,943	1,540	387	-	1,927	17
Swaps	17,085	9,543	16,884	43,512	16,791	9,163	16,785	42,739	565
EXCHANGE RATE HEDGING DERIVATIVES	**18,635**	**9,936**	**16,884**	**45,455**	**18,331**	**9,550**	**16,785**	**44,666**	**582**

At 31 December 2017:

	Notional amount to be received at 31/12/2017				Notional amount to be given at 31/12/2017				Fair value
(in millions of euros)	< 1 year	1-5 years	> 5 years	**Total**	< 1 year	1-5 years	> 5 years	**Total**	**31/12/2017**
Forward exchange transactions	2,478	518	-	2,996	2,475	514	-	2,989	-
Swaps	12,469	10,614	12,724	35,807	12,592	10,384	13,155	36,131	(606)
EXCHANGE RATE HEDGING DERIVATIVES	**14,947**	**11,132**	**12,724**	**38,803**	**15,067**	**10,898**	**13,155**	**39,120**	**(606)**

The notional value of cross-currency swaps shown in this note is also included in the note on interest rate hedging derivatives (note 41.4.1).

41.4.3 Commodity-related cash flow hedges

For commodities, changes in fair value are mainly explained by:

(in millions of euros)	**31/12/2018**	31/12/2017
Electricity hedging contracts	(629)	(916)
Gas hedging contracts	(231)	69
Coal hedging contracts	(107)	36
Oil product hedging contracts	(446)	149
CO_2 emission rights hedging contracts	370	49
Changes in fair value before taxes	**(1,043)**	**(613)**

The main components of the amount transferred to income in respect of commodity hedges terminated during the year are:

(in millions of euros)	**31/12/2018**	31/12/2017
Electricity hedging contracts	(388)	(1,744)
Gas hedging contracts	(280)	50
Coal hedging contracts	(109)	31
Oil product hedging contracts	(194)	(66)
CO_2 emission rights hedging contracts	183	15
Changes in fair value before taxes	**(788)**	**(1,714)**

Details of commodity-related cash flow hedges are as follows:

		31/12/2018					31/12/2017	
(in millions of euros)	Units of measure	Net notional				Fair value	Net notional	Fair value
		< 1 year	1-5 years	> 5 years	Total			
Swaps		(4)		-	(4)	50	2	58
Forwards/futures		(4)	(47)	-	(51)	(859)	(72)	(688)
Electricity	**TWh**	**(8)**	**(47)**	**-**	**(55)**	**(809)**	**(70)**	**(630)**
Swaps		(205)	15	-	(190)	9	(233)	(16)
Forwards/futures		1,049	455	-	1,504	25	1,451	65
Gas	**Millions of therms**	**844**	**470**	**-**	**1,314**	**34**	**1,218**	**49**
Swaps		4,180	6,222	-	10,402	(53)	14,175	109
Options		180	-	-	180	-	379	2
Oil products	**Thousands of barrels**	**4,360**	**6,222**	**-**	**10,582**	**(53)**	**14,554**	**111**
Swaps		-	-	-	-	-	-	40
Coal	**Millions of tonnes**	**-**	**-**	**-**	**-**	**-**	**-**	**40**
Swaps		-	-	-	-	-	-	-
Forwards/futures		4,500	8,988	-	13,488	183	19,576	19
CO_2	**Thousands of tonnes**	**4,500**	**8,988**	**-**	**13,488**	**183**	**19,576**	**19**
Commodity-related cash flow hedges						(645)		(411)

41.5 COMMODITY-RELATED FAIR VALUE HEDGES

Details of commodity-related fair value hedges are as follows:

		31/12/2018		31/12/2017	
(in millions of euros)	Units of measure	Net notional	Fair value	Net notional	Fair value
Coal and freight	Millions of tonnes	(3)	2	4	3
Oil products	Thousands of barrels	5,136	(23)	-	-
Gas	Millions of therms	(93)	(31)	(583)	31
COMMODITY-RELATED FAIR VALUE HEDGES			(52)		34

NOTE 42 NON-HEDGING DERIVATIVES

Details of the fair value of trading derivatives reported in the balance sheet are as follows:

(in millions of euros)	Notes	31/12/2018	31/12/2017
Positive fair value of trading derivatives	36.1	6,404	2,614
Negative fair value of trading derivatives	38.1	(7,160)	(2,787)
FAIR VALUE OF TRADING DERIVATIVES		(756)	(173)
Interest rate derivatives held for trading	42.1	(60)	(33)
Currency derivatives held for trading	42.2	(96)	73
Non-hedging commodity derivatives	42.3	(641)	(213)
Other contracts		41	-

42.1 INTEREST RATE DERIVATIVES HELD FOR TRADING

Interest rate derivatives held for trading break down as follows:

	Notional at 31/12/2018				Notional at 31/12/2017	Fair value	
(in millions of euros)	< 1 year	1-5 years	> 5 years	Total	Total	**31/12/2018**	31/12/2017
Purchases of options	-	-	516	516	519	7	15
Interest rate operations	**-**	**-**	**516**	**516**	**519**	**7**	**15**
Fixed rate payer/floating rate receiver	1,517	1,247	1,121	3,885	2,978	(64)	(42)
Floating rate payer/fixed rate receiver	-	122	-	122	416	(4)	(8)
Floating rate/floating rate	-	5	-	5	351	-	1
Fixed rate/fixed rate	28	42	70	140	338	1	1
Interest rate swaps	**1,545**	**1,416**	**1,191**	**4,152**	**4,083**	**(67)**	**(48)**
INTEREST RATE DERIVATIVES HELD FOR TRADING	1,545	1,416	1,707	4,668	4,602	(60)	(33)

42.2 CURRENCY DERIVATIVES HELD FOR TRADING

Currency derivatives held for trading break down as follows:

At 31 December 2018:

	Notional amount to be received at 31/12/2018				Notional amount to be given at 31/12/2018				Fair value
(in millions of euros)	< 1 year	1-5 years	> 5 years	**Total**	< 1 year	1-5 years	> 5 years	**Total**	**31/12/2018**
Forward transactions	3,223	2,017	4	5,244	3,215	1,989	5	5,209	2
Swaps	11,885	6,570	70	18,525	11,981	6,689	69	18,739	(98)
CURRENCY DERIVATIVES HELD FOR TRADING	15,108	8,587	74	23,769	15,196	8,678	74	23,948	(96)

At 31 December 2017:

	Notional amount to be received at 31/12/2017				Notional amount to be given at 31/12/2017				Fair value
(in millions of euros)	< 1 year	1-5 years	> 5 years	Total	< 1 year	1-5 years	> 5 years	Total	31/12/2017
Forward transactions	2,438	1,079	8	3,525	2,443	1,089	9	3,541	(23)
Swaps	11,986	4,823	74	16,883	11,960	4,764	73	16,797	96
CURRENCY DERIVATIVES HELD FOR TRADING	14,424	5,902	82	20,408	14,403	5,853	82	20,338	73

42.3 NON-HEDGING COMMODITY DERIVATIVES

Details of commodity derivatives not classified as hedges are as follows:

		31/12/2018		31/12/2017	
(in millions of euros)	Unit of measure	Net notional	Fair value	Net notional	Fair value
Swaps		3	502	(5)	479
Options		4	(22)	4	106
Forwards/futures		(50)	(123)	(54)	(403)
Electricity	**TWh**	**(43)**	**357**	**(55)**	**182**
Swaps		(510)	(515)	894	(132)
Options		32	185	(68)	171
Forwards/futures		16,323	80	19,784	57
Gas	**Millions of therms**	**15,845**	**(250)**	**20,610**	**96**
Swaps		27,715	(82)	3,400	94
Options		500	1	1,920	3
Forwards/futures		(360)	(3)	108	(3)
Oil products	**Thousands of barrels**	**27,855**	**(84)**	**5,428**	**94**
Swaps		(2,521)	6	(1)	(151)
Options		-	(14)	3	(1)
Forwards/futures		-	-	4	9
Freight		3,232	(2)	(4)	17
Coal and freight	**Millions of tonnes**	**711**	**(10)**	**2**	**(126)**
Swaps		-	-	*43*	-
Options		(5,000)	(150)	-	-
Forwards/futures		(56,433)	(446)	*35,583*	*(57)*
CO_2	**Thousands of tonnes**	**(61,433)**	**(596)**	**35,626**	**(57)**
Swaps/options			29		(56)
Forwards/futures			(87)		(346)
Other commodities			**(58)**		**(402)**
Embedded commodity derivatives			**-**		**-**
NON-HEDGING COMMODITY DERIVATIVES			(641)		(213)

These mainly include contracts included in EDF Trading's portfolio.

ASSETS HELD FOR SALE AND RELATED LIABILITIES

NOTE 43 ASSETS HELD FOR SALE AND RELATED LIABILITIES

(in millions of euros)	31/12/2018	31/12/2017
ASSETS HELD FOR SALE	-	-
LIABILITIES RELATED TO ASSETS HELD FOR SALE	-	-

NOTE 44 CASH FLOWS

44.1 CHANGE IN WORKING CAPITAL

(in millions of euros)	2018	2017 restated [1]
Change in inventories	(18)	543
Change in the receivable for Contribution to the Public Electricity Service (CSPE)	357	499
Change in trade receivables	1,259	376
Change in trade payables	(707)	550
Change in other receivables and payables (excluding CSPE)	(429)	(492)
CHANGE IN WORKING CAPITAL	462	1,476

(1) The published figures at 31 December 2017 have been restated according to IFRS 15 (note 2.1.3.2).

44.2 INVESTMENTS IN INTANGIBLE AND TANGIBLE ASSETS

(in millions of euros)	2018	2017
Acquisitions of intangible assets	(1,828)	(1,165)
Acquisitions of tangible assets	(13,990)	(14,329)
Change in payables to suppliers of fixed assets	(368)	747
INVESTMENTS IN INTANGIBLE AND TANGIBLE ASSETS	(16,186)	(14,747)

NOTE 45 EDF'S DEDICATED ASSETS

45.1 REGULATIONS

Article L. 594 of France's Environment Code and its implementing regulations require assets (dedicated assets) to be set aside for secure financing of nuclear plant decommissioning expenses and long-term storage expenses for radioactive waste. These regulations govern the way dedicated assets are built up, and the management and governance of the funds themselves. Dedicated assets are clearly identified and managed separately from the company's other financial assets and investments. They are also subject to specific monitoring and control by the Board of Directors and the administrative authorities.

The law requires the realisable value of dedicated assets to be higher than the value of the provisions corresponding to the present value of the long-term nuclear expenses defined above.

The Decree of 29 December 2010 made RTE shares eligible for inclusion in dedicated assets subject to certain conditions and administrative authorisation. The Decree of 24 July 2013 also revised the list of eligible assets by reference to the Insurance Code, making unlisted assets eligible subject to certain conditions.

The Decree of 24 March 2015 contains two measures concerning dedicated assets:

- the annual allocation to dedicated assets, net of any increases to provisions, must be positive or zero as long as their realisable value is below 110% of the amount of the provisions concerned;
- subject to certain conditions, real estate property owned by the operators of nuclear facilities may be allocated to coverage of these provisions.

Subject to certain conditions, the Decree of 19 December 2016 authorised allocation of the shares of CTE, which holds 100% of the capital of RTE, to the portfolio of dedicated assets at 31 December 2017 (see note 45.2.2 below).

EDF also received ministerial authorisation on 31 May 2018 to increase the portion of unlisted assets in its dedicated assets from 10% to 15% subject to conditions (this does not apply to the shares of CTE or real estate assets).

45.2 PORTFOLIO CONTENTS AND MEASUREMENT

Given the applicable regulations, these dedicated assets are a highly specific category of assets.

Dedicated assets are structured and managed according to a strategic allocation defined by the Board of Directors and reported to the administrative authorities. The strategic allocation is designed to meet the overall objective of long-term coverage of obligations, and determines the structure and management of the portfolio as a whole. It takes into account regulatory constraints concerning the nature and liquidity of the dedicated assets, the financial outlook for the equity and bond markets, and the diversifying contribution of unlisted assets.

As part of the strategic allocation review process and in order to pursue the diversification into unlisted assets begun in 2010 with the shares in RTE, in 2013 the Board of Directors approved the introduction of an unlisted asset portfolio alongside the diversified equity and bond investments. This portfolio is managed by the EDF Invest division, which was formed following the Decree of 24 July 2013 on securing the funding for nuclear expenses. EDF Invest has the following target asset classes: infrastructures, real estate and debt or equity funds.

Following the French government's authorisation issued on 8 February 2013, and the approval of the Nuclear Commitments Monitoring Committee and the Board of Directors' decision of 13 February 2013, EDF allocated the entire receivable recognised by the French State, representing the accumulated shortfall in CSPE financing at 31 December 2012, to its dedicated assets.

This financial receivable was increased in the financial statements at 31 December 2015 by an additional amount estimated at €644 million that was not allocated to dedicated assets, corresponding to the shortfalls in compensation that arose between the beginning of 2013 and the end of 2015, as acknowledged by the State in a ministerial letter of 26 January 2016. In accordance with this letter, the total financial receivable bears interest at 1.72% and will be repaid under a revised schedule ending in late 2020. This schedule was laid down in a ministerial order of 2 December 2016, based on the CRE's confirmation of the shortfall for 2015.

On 22 December 2016, EDF assigned a 26.4% portion of this financial receivable, including the additional receivable corresponding to the shortfalls in compensation between 2013 and 2015, to a pool of investors.

Consequently, the realisable value of the non-assigned portion of the receivable, which is totally allocated to dedicated assets, is calculated based on the assignment value at that date.

The amount received for assignment of the portion of the CSPE receivable that was allocated to dedicated assets (€894 million) was reinvested in dedicated assets, in the same way as the reimbursements received (see note 3.11.3).

After receiving the ministerial letter of 31 May 2018 authorising EDF, subject to conditions, to increase the portion of unlisted assets in its dedicated assets, on 29 June 2018 the Board of Directors validated the following new strategic allocation for dedicated assets:

- Yield assets (target: 30% of dedicated assets), consisting of infrastructure assets, including the shares of CTE, and real estate property;
- Growth assets (target: 40% of dedicated assets), consisting of equity funds investing in listed or unlisted equities;
- Fixed-income assets (target: 30% of dedicated assets), consisting of listed bonds or listed bond funds, unlisted debt funds, receivables and cash.

These targets should be reached gradually, mainly by reinvesting fixed-income assets in yield assets and growth assets.

45.2.1 Growth assets and fixed-income assets

Certain growth and fixed-income assets take the form of bonds held directly by EDF. Others consist of specialised collective investment funds on leading international markets, managed by independent asset management companies. They take the form of open-end funds and "reserved" funds established for the Group (which does not participate in the fund management).

The listed equity funds consist of international equities (mainly in North America but also in Europe, Asia-Pacific and emerging countries). Listed bonds and listed bond funds consist of sovereign and corporate bonds.

These investments are structured and managed in line with the strategic allocation, which takes into consideration international stock market cycles, for which the statistical inversion generally observed between equity market cycles and bond market cycles – as well as between geographical areas – has led the Group to define a long-term investment policy with appropriate allocation between growth assets and fixed-income assets.

Under the new strategic allocation, growth assets also include a small portion of funds invested in unlisted equities, and fixed-income assets also include a small portion of funds invested in unlisted debt. These funds are managed by EDF Invest (see note 45.2.2).

Since the application of IFRS 9 from 1 January 2018, all these assets have been included in debt and equity securities.

At the year-end, dedicated assets are presented in debt and equity securities in the balance sheet, at their liquidation value.

In the course of operational asset monitoring, the Group applies long-term, specific management rules defined and supervised by its governance bodies (maximum investment ratios, volatility analyses and assessment of individual fund manager quality).

45.2.2 Yield assets

The yield assets managed by EDF Invest consist of assets related to investments in infrastructures and real estate.

Through investment funds, EDF Invest also manages growth assets and fixed-income assets (see note 45.2.1).

At 31 December 2018, the assets managed by EDF Invest represent a total realisable value of €5,680 million, including €5,356 million of yield assets. Yield assets particularly include:

- 50.1% of the Group's shares in CTE, the joint venture that owns RTE, in compliance with Decree 2016-1781 of 19 December 2016 amending the Decree of 23 February 2007. These shares amount to €2,738 million at 31 December 2018 (€2,705 million at 31 December 2017) (see note 3.11.3);
- the Group's investment in Terega, Porterbrook, Autostrade per l'Italia, Q-Park and companies that own wind farms in the United Kingdom (Bicker Fen, Glass Moor II, Green Rigg, Rusholme), which are presented in debt and equity securities in the consolidated balance sheet;
- the Group's investments in Madrileña Red de Gas (MRG), Géosel, Thyssengas, Aéroports de la Côte d'Azur, Central Sicaf, Fallago Rig, Fenland, Ecowest SCI A and B and Nam Theun Power Company, which are presented in investments in associates in the consolidated balance sheet.

45.3 VALUATION OF EDF'S DEDICATED ASSETS

EDF's dedicated assets are included in the Group's consolidated financial statements at the following values:

		31/12/2018		31/12/2017	
(in millions of euros)	Consolidated balance sheet presentation	Book value	Realisable value	Book value	Realisable value
Yield assets (EDF Invest)		**3,919**	**5,356**	**3,652**	**5,210**
CTE	Investments in associates [1]	1,406	2,738	1,241	2,705
Other associates	Investments in associates [2]	1,167	1,234	893	944
Other unlisted assets	Debt and equity securities and other net assets [3]	1,346	1,384	1,518	1,561
Growth assets		**10,108**	**10,108**	**10,099**	**10,099**
Equities [4]	Debt securities	9,844	9,844	9,942	9,942
Unlisted equity funds (EDF Invest)	Debt securities	219	219	127	127
Derivatives	Fair value of derivatives	45	45	30	30
Fixed-income assets		**12,205**	**12,225**	**12,751**	**12,806**
Bonds	Debt securities	10,010	10,010	9,282	9,282
Unlisted debt funds (EDF Invest)	Debt securities	105	105	71	71
Cash portfolio [5]	Debt securities	30	30	104	104
CSPE receivable [6]	Loans and financial receivables	2,060	2,080	3,294	3,349
TOTAL EDF DEDICATED ASSETS		**26,232**	**27,689**	**26,502**	**28,115**

(1) The Group's investment of 50.1% of CTE, the company that holds 100% of the shares in RTE. The CTE shares are included at their equity value in the consolidated financial statements (book value in the table). The realisable value of CTE at 31 December 2018 in the above table has been determined by an independent assessor, in the same way as for EDF Invest's other assets. The realisable value of CTE at 31 December 2017 was based on the sale transaction price of 31 March 2017.

(2) Including the value of the share in equity of the controlled companies owning these investments.

(3) Including debt and equity securities amounting to €1,221 million and the value of the share in equity of other controlled companies.

(4) Including €391 million of securities acquired in late December 2018 for which payment took place in early January 2019.

(5) After deduction of the €391 million of liabilities on securities acquired in late December 2018 for which payment took place in early January 2019.

(6) The receivable consisting of accumulated shortfalls in compensation at 31 December 2015, less the portion assigned on 22 December 2016 and reimbursements received since then, in line with the repayment schedule. The realisable value of the CSPE receivable is estimated based on market rates.

Structured entities – Investment funds

The investment funds held by the Group (see note 1.3.2.9) reported in the table under "Debt and equity securities" are located in France and owned by EDF. The Group has not given these funds any financial support.

The value of the assets of these investment funds amounts to €4,898 million at 31 December 2018 (€3,294 million at 31 December 2017). The funds mainly consist of 11 listed funds with total value of €4,340 million (at 31 December 2017, 12 listed funds with total value of €2,906 million).

45.4 COVERAGE OF LONG-TERM NUCLEAR OBLIGATIONS

At 31 December 2018, by the regulatory calculations provisions are 98.3% covered by dedicated assets. The regulatory limit on the realisable value of certain investments (decree 2007-243) has no effect at 31 December 2018.

At 31 December 2017, by the regulatory calculations provisions were 108.5% covered by dedicated assets. The regulatory limit on the realisable value of certain investments (decree 2007-243) also had no effect at 31 December 2017.

The coverage of nuclear provisions at 31 December 2018 complies with the ministerial decision of 28 December 2018 which extended the scope of provisions to be covered by dedicated assets. Following that ministerial decision, €298 million of provisions previously considered to belong to the operating cycle as defined by the regulations were transferred to long-term provisions, with an effect of -1.05% on the coverage rate.

Withdrawals from dedicated assets in 2018 totalled €403 million, equivalent to payments made in respect of the long-term nuclear obligations to be covered during the year (€378 million in 2017).

Over a 10-year horizon, disbursements will be made to the following extent (at year-end economic conditions, i.e. in 2018 euros):

- 14% of provisions for long-term radioactive waste management;
- 11% of provisions for decommissioning.

Over a 50-year horizon, disbursements will be made to the following extent (at year-end economic conditions, i.e. in 2018 euros):

- 35% of provisions for long-term radioactive waste management;
- 93% of provisions for decommissioning.

The Group's long-term nuclear obligations in France concerned by the regulations for dedicated assets related to nuclear generation are included in the EDF group's consolidated financial statements at the following values:

(in millions of euros)	**31/12/2018**	31/12/2017
Provisions for spent fuel management – portion unrelated to the operating cycle as defined in the regulations	1,067	983
Provisions for long-term radioactive waste management	9,846	8,814
Provisions for waste removal and conditioning	751	726
Provisions for nuclear plant decommissioning	15,985	14,920
Provisions for last cores – portion for future long-term radioactive waste management	518	467
PRESENT COST OF LONG-TERM NUCLEAR OBLIGATIONS	**28,167**	**25,910**

Because of changes (other than regulatory modifications) in the assumptions used to calculate long-term nuclear provisions, particularly the change in the discount rate, the required allocation to dedicated assets for 2018 is amounting to €1,337 million. The administrative authorities authorised EDF to spread this allocation as follows: €540 million in 2019 and 2020, and €257 million in 2021. Including the allocation to be made in 2019 for 2018, all other things being equal, the coverage rate at 31 December 2018 would be 100.2%.

45.5 CHANGES IN DEDICATED ASSETS IN 2018

Following a ministerial letter of 31 May 2018 authorising EDF, subject to conditions, to increase the portion of unlisted assets in its dedicated assets, on 29 June 2018 the Board of Directors validated a new strategic allocation for dedicated assets (see note 45.2).

The regulatory allocation to dedicated assets for 2017 amounted to €386 million and was made during 2018.

EDF Invest continued over 2018 to build up a portfolio of infrastructures, real estate property and investment funds. Among its new investments, in November 2018 EDF Invest completed the purchase of a minority interest in six UK companies (Bicker Fen, Fallago Rig, Fenland, Glass Moor II, Green Rigg, Rusholme) from EDF Renewables.

In December 2018, EDF Invest acquired EDF International's minority interest in Nam Theun Power Company (NTPC), a hydroelectric dam in Laos, part of which was allocated to dedicated assets at that date. The rest will be allocated in 2019.

These new investments have been added to the infrastructures assets that are part of EDF Invest's yield assets, alongside investments including CTE (the company that owns RTE), Terega (formerly TIGF), Porterbrook, Madrileña Red de Gas, Géosel, Thyssengas, Aéroports de la Côte d'Azur, Autostrade per l'Italia and Q-Park.

Negative changes of €989 million in the fair value of the dedicated asset portfolio (investment funds and equities) were recognised in the financial result in 2018 in application of IFRS 9 (see note 15.3).

Negative changes of €60 million in the fair value of the dedicated asset portfolio (bonds) were recognised in OCI in 2018 in application of IFRS 9 (see note 36.2).

45.6 DEDICATED ASSETS OF FRAMATOME AND SOCODEI

The dedicated assets of Framatome and SOCODEI relating to Basic nuclear facilities (INB) in France have realisable values of €72 million and €47 million respectively and the degree of coverage of provisions according to the regulations is 92.8% for Framatome and 103.5% for SOCODEI (calculated using EDF group discount and inflation rates for nuclear provisions in France – see note 30).

These two entities' long-term nuclear obligations in France concerned by the regulations for dedicated assets are included in the EDF group's consolidated financial statements at the amounts of €78 million for Framatome and €46 million for SOCODEI (see note 30).

NOTE 46 OFF-BALANCE SHEET COMMITMENTS

This note presents off-balance sheet commitments given and received by the Group at 31 December 2018. The amounts of commitments correspond to non-discounted contractual values.

46.1 COMMITMENTS GIVEN

The table below shows off-balance sheet commitments given by the Group that have been valued. Other commitments are described separately in the detailed notes.

(in millions of euros)	Notes	31/12/2018	31/12/2017
Operating commitments given	46.1.1	45,370	44,705
Investment commitments given	46.1.2	17,572	17,222
Financing commitments given	46.1.3	5,494	5,123
TOTAL COMMITMENTS GIVEN		68,436	67,050

In almost all cases, these are reciprocal commitments, and the third parties concerned are under a contractual obligation to supply the Group with assets or services related to operating, investment and financing activities.

46.1.1 Operating commitments given

Operating commitments given by the Group at 31 December 2018 are as follows:

(in millions of euros)	31/12/2018	31/12/2017
Fuel and energy purchase commitments (1)	26,878	26,728
Operating contract performance commitments given	14,117	13,739
Operating lease commitments as lessee	4,375	4,238
TOTAL OPERATING COMMITMENTS GIVEN	45,370	44,705

(1) Excluding gas purchases and related services

46.1.1.1 Fuel and energy purchase commitments

In the course of its ordinary generation and supply activities, the Group has entered into long-term contracts for purchases of electricity, gas, other energies and commodities and nuclear fuel, for periods of up to 20 years.

The Group has also entered into long-term purchase contracts with a certain number of electricity producers, by contributing to the financing of power plants.

At 31 December 2018, fuel and energy purchase commitments mature as follows:

	31/12/2018					31/12/2017
	Total	Maturity				Total
(in millions of euros)		< 1 year	1-5 years	5-10 years	> 10 years	
Electricity purchases and related services [1]	**10,368**	2,077	3,571	2,319	2,401	9,767
Other energy and commodity purchases [2]	**377**	94	194	89	-	391
Nuclear fuel purchases	**16,133**	1,469	6,232	5,148	3,284	16,570
FUEL AND ENERGY PURCHASE COMMITMENTS	**26,878**	**3,640**	**9,997**	**7,556**	**5,685**	**26,728**

(1) Including commitments given by controlled entities to joint ventures, amounting to €604 million at 31 December 2018 (€606 million at 31 December 2017).
(2) Excluding gas purchases and related services – see note 46.1.1.1.4.

46.1.1.1.1 Electricity purchases and related services

Electricity purchase commitments mainly concern EDF and EDF Energy. In the case of EDF many of these commitments are borne by the Island Energy Systems (SEI), which have made commitments to purchase the electricity generated using bagasse and coal.

In addition to the obligations reported above and under Article 10 of the Law of 10 February 2000, in mainland France EDF is obliged, at the producer's request and subject to compliance with certain technical features, to purchase the power produced by co-generation plants and renewable energy generation units (wind turbines, small hydro-electric plants, photovoltaic power, etc). The additional costs generated by this obligation are offset, after validation by the CRE, by the CSPE. These purchase obligations total 53TWh for 2018 (47TWh for 2017), including 7TWh for co-generation (6TWh for 2017), 26TWh for wind power (23TWh for 2017), 9TWh for photovoltaic power (9TWh for 2017) and 3TWh for hydropower (3TWh for 2017).

46.1.1.1.2 Other energy and commodity purchases

Purchase commitments for other energies and commodities mainly concern coal and oil used to operate the fossil-fired plants, and purchases of biomass fuel used by Dalkia in the course of its business.

46.1.1.1.3 Nuclear fuel purchases

Commitments for purchases of nuclear fuel arise from supply contracts for the nuclear plants intended to cover the EDF group's needs for uranium and fluoration, enrichment and fuel assembly production services.

46.1.1.1.4 Gas purchases and related services

Gas purchase commitments are principally undertaken by Edison and EDF. The volumes concerned for both entities at 31 December 2018 are as follows:

	31/12/2018				31/12/2017
	Total	Maturity			Total
(in billions of m³)		< 1 year	1-5 years	> 5 years	
Edison	**140**	13	40	87	**154**
EDF	**22**	1	5	16	**24**

Gas purchase contracts

Edison has entered into agreements to import natural gas from Russia, Libya, Algeria and Qatar, for a total maximum volume of 14.4 billion m³ per year. The terms of these contracts vary between 3 and 18 years, with the exception of the contracts with Algeria and Russia which terminate at the end of 2019.

Gas-related service contracts

Under the contract with Terminale GNL Adriatico, Edison also benefits from approximately 80% of the terminal's regasification capacities until 2034, for an annual premium of approximately €100 million.

Under the contract with the Dunkerque LNG methane terminal, EDF benefits from approximately 61% of the terminal's regasification capacities until 2037, in return for payment of an annual premium of approximately €150 million. A provision for onerous contract has been recorded in connection with this contract – see note 3.3.

46.1.1.2 Operating contract performance commitments given

At 31 December 2018, these commitments mature as follows:

	31/12/2018				31/12/2017
	Total	Maturity			Total
(in millions of euros)		< 1 year	1-5 years	> 5 years	
Operating guarantees given	**7,047**	3,185	2,124	1,738	7,074
Operating purchase commitments [1]	**6,898**	3,960	2,352	586	6,460
Other operating commitments	**172**	64	95	13	205
OPERATING CONTRACT PERFORMANCE COMMITMENTS GIVEN [2]	**14,117**	**7,209**	**4,571**	**2,337**	**13,739**

(1) Excluding fuel and energy.
(2) Including commitments given by controlled entities to joint ventures, amounting to €982 million at 31 December 2018 (€835 million at 31 December 2017).

In the course of its business, the Group provides contract performance guarantees, generally through the intermediary of banks.

Operating guarantees given at 31 December 2018 mainly consist of guarantees given by EDF, Edison and EDF Renewables in connection with its development projects.

46.1.1.2.1 Operating guarantees given

Operating guarantees given are as follows:

(in millions of euros)	31/12/2018	31/12/2017
EDF	2,038	2,270
EDF Renewables	1,677	1,363
Edison	1,262	1,215
EDF Energy	795	732
Framatome	517	714
Other entities	758	780
TOTAL	**7,047**	**7,074**

46.1.1.2.2 Operating purchase commitments

Operating purchase commitments are as follows:

(in millions of euros)	31/12/2018	31/12/2017
EDF	2,533	2,480
Framatome	2,024	1,878
EDF Energy	524	627
Enedis	764	601
Other entities	1,053	874
TOTAL	6,898	6,460

46.1.1.3 Operating lease commitments as lessee

At 31 December 2018, operating lease commitments as lessee break down as follows:

	31/12/2018				31/12/2017
	Total	Maturity			Total
(in millions of euros)		< 1 year	1-5 years	> 5 years	
OPERATING LEASE COMMITMENTS AS LESSEE	4,375	728	2,019	1,628	4,238

The Group is bound as lessee by irrevocable operating lease contracts, principally for premises, equipment, land and vehicles used in the course of its business and maritime freight contracts for trading activities. The corresponding rents are subject to renegotiation at intervals defined in the contracts. Operating leases mainly concern EDF, EDF Renewables and Enedis.

IFRS 16 "Leases" will be mandatory for financial years beginning on or after 1 January 2019 (see note 1.2.4.1).

46.1.2 Investment commitments given

At 31 December 2018, details of investment commitments are as follows:

	31/12/2018				31/12/2017
	Total	Maturity			Total
(in millions of euros)		< 1 year	1-5 years	> 5 years	
Commitments related to acquisition of tangible and intangible assets	16,545	8,138	7,674	733	15,827
Commitments related to acquisition of financial assets	746	219	429	98	1,013
Other commitments related to investments	281	238	43	-	382
TOTAL INVESTMENT COMMITMENTS GIVEN (1)	17,572	8,595	8,146	831	17,222

(1) Including commitments given by controlled entities to joint ventures, amounting to €399 million at 31 December 2018 (€428 million at 31 December 2017).

46.1.2.1 Commitments related to acquisition of tangible and intangible fixed assets

The commitments related to acquisition of tangible and intangible fixed assets are as follows:

(in millions of euros)	31/12/2018	31/12/2017
EDF	4,715	4,689
EDF Energy	6,082	6,428
Enedis	3,092	2,383
EDF Renewables	1,622	1,242
Framatome	587	562
Other entities	447	523
TOTAL	16,545	15,827

The increase in commitments given for acquisition of tangible and intangible assets is principally attributable to contracts for the rollout of Linky meters by Enedis and development of new projects in the United States by EDF Renewables. The decrease in commitments by EDF Energy is explained by progress on the HPC project.

46.1.2.2 Commitments related to acquisition of financial assets

Commitments related to acquisition of financial assets in 2017 included €193 million for the acquisition of Gas Natural Vendita Italia (now Edison Energie), which was finalised on 22 February 2018 (see note 5.3).

The main share purchase commitments that cannot be valued concern EDF Luminus.

EDF Luminus signed an amendment to the shareholder pact on 26 October 2015 defining a liquidity clause for the investments held by its minority shareholders, which could, in certain conditions under the control of EDF, result in sale of their shares through an IPO, or purchase of their shares by the Group at market value. This liquidity clause is valid at all times from 1 July 2018 to 31 December 2025.

Regarding the investment in EDF Investissements Groupe (EIG), C3 (a fully-owned EDF subsidiary) and NBI (Natixis Belgique Investissement, a subsidiary of the Natixis group) amended the agreements for their investment in EIG on 19 December 2018.

C3 now has a call option to buy EIG shares held by NBI at a fixed price, exercisable at any time until May 2026. Meanwhile, NBI has a put option to sell EDF all of its EIG shares for a fixed amount of cash, exercisable subject to certain conditions between February 2024 and May 2025.

Due to their features, in compliance with IAS 32, NBI's put option and C3's call option are considered as derivatives and their net value is included in the positive or negative fair value of trading derivatives. At 31 December 2018, the fair value of these trading derivatives is not significant.

46.1.2.3 Other commitments related to investments

Other commitments given related to investments at 31 December 2018 mainly comprise guarantees given by EDF Norte Fluminense in connection with its 51% investment in CES, the company in charge of constructing and operating a hydroelectric dam on the Teles Pires river in Brazil.

46.1.3 Financing commitments given

Financing commitments given by the Group at 31 December 2018 comprise the following:

	31/12/2018				31/12/2017
	Total	Maturity			Total
(in millions of euros)		< 1 year	1-5 years	> 5 years	
Security interests in real property	**4,226**	31	1,805	2,390	4,250
Guarantees related to borrowings	**974**	138	335	501	613
Other financing commitments	**294**	271	23	-	260
TOTAL FINANCING COMMITMENTS GIVEN [1]	**5,494**	**440**	**2,163**	**2,891**	**5,123**

(1) Including commitments given by controlled entities to joint ventures, amounting to €917 million at 31 December 2018 (€692 million at 31 December 2017). These financing commitments to joint ventures mainly concern EDF Renewables.

Security interests and assets provided as guarantees mainly concern pledges or mortgages of tangible assets and shares representing investments in consolidated subsidiaries which own property, plant and equipment, for EDF Renewables.

46.2 COMMITMENTS RECEIVED

The table below shows off-balance sheet commitments received by the Group that have been valued. Other commitments received are described separately in the detailed notes.

(in millions of euros)	Notes	31/12/2018	31/12/2017 restated [1]
Operating commitments received [2]	46.2.1	9,539	9,057
Investment commitments received	46.2.2	183	214
Financing commitments received	46.2.3	31	72
Total commitments received [3]		**9,753**	**9,343**

(1) Commitments at 31 December 2017 have been restated by €5,422 million in application of IFRS 15. They mainly concerned other commitments received by Framatome and EDF Renewables for sales of goods and services.
(2) Excluding commitments related to supplies of energy and related services (see note 46.2.1.4).
(3) Excluding commitments related to credit lines, which are described in note 38.2.5.

46.2.1 Operating commitments received

Operating commitments received by the Group at 31 December 2018 comprise the following:

	31/12/2018				31/12/2017
	Total	Maturity			Total
(in millions of euros)		< 1 year	1-5 years	> 5 years	
Operating lease commitments as lessor	678	124	399	154	780
Operating sale commitments [1]	7,004	1,745	4,224	1,035	6,748
Operating guarantees received	1,791	1,014	591	186	1,483
Other operating commitments received	66	17	35	14	46
OPERATING COMMITMENTS RECEIVED	**9,539**	**2,900**	**5,249**	**1,389**	**9,057**

(1) Commitments at 31 December 2017 have been restated by €5,422 million in application of IFRS 15. They mainly concerned other commitments received by Framatome and EDF Renewables for sales of goods and services.

46.2.1.1 Operating lease commitments as lessor

The Group benefits from commitments as lessor in operating leases amounting to €678 million.

Most of these commitments derive from contracts classified as operating leases under IFRIC 4, "Determining whether an arrangement contains a lease". They mainly concern the Asian Independent Power Projects (IPPs) and real estate leases.

46.2.1.2 Operating sale commitments

Operating sale commitments received principally concern firm orders made through contracts recorded on a percentage-of-completion basis at Framatome (construction and engineering contracts) and EDF Renewables (agreements for operation services, maintenance services, and development and sale of structured assets).

46.2.1.3 Operating guarantees received

Operating guarantees received primarily concern EDF and relate to guarantees received from suppliers, particularly in connection with deliveries under the ARENH system.

46.2.1.4 Electricity supply commitments

In the course of its business, the EDF group has signed long-term contracts to supply electricity as follows:

- long-term contracts with a number of European electricity operators, for a specific plant or for a defined group of plants in the French nuclear generation fleet, corresponding to installed power capacity of 3.5GW;
- in execution of France's NOME Law on organisation of the French electricity market, EDF has a commitment to sell some of the energy generated by its existing nuclear power plants to other suppliers. This covers volumes of up to 100TWh each year until 31 December 2025.

46.2.2 Investment commitments received

	31/12/2018				31/12/2017
	Total	Maturity			Total
(in millions of euros)		< 1 year	1-5 years	> 5 years	
INVESTMENT COMMITMENTS RECEIVED	183	49	16	118	214

Under the terms of the agreement signed with Exelon on 29 July 2013 and finalised on 1 April 2014, EDF has an option to sell its share in CENG to Exelon at fair value, which can be exercised between January 2016 and June 2022. Due to its features, this commitment has nil value at 31 December 2018.

46.2.3 Financing commitments received

	31/12/2018				31/12/2017
	Total	Maturity			Total
(in millions of euros)		*< 1 an*	*1-5 years*	*> 5 years*	
FINANCING COMMITMENTS RECEIVED	30	6	4	20	72

NOTE 47 CONTINGENT LIABILITIES

In addition to the matters reported in note 4.3, the principal contingent liabilities at 31 December 2018 are the following.

47.1 TAX INSPECTIONS

EDF

For the period 2008 to 2015, EDF was notified of proposed tax adjustments, notably concerning the tax-deductibility of certain long-term liabilities. This recurrent reassessment, which is applied for each year, represents a cumulative financial risk of some €563 million in income taxes at 31 December 2018. In September 2017 the Montreuil Administrative Court issued two rulings that recognised the tax-deductibility of these liabilities and validated the position taken by the Company.

For the years 2012 to 2015, the French tax authorities notified the Company of certain recurrent tax reassessments concerning the *Contribution sur la Valeur ajoutée des Entreprises* (tax on corporate value added),and questioned the deductibility of long-term provisions.

EDF International

Following the tax inspections of EDF International for the years 2009 to 2014, the French tax authorities questioned the valuation of the bond convertible into shares issued to refinance the acquisition of British Energy. The total amount concerned is approximately €310 million. EDF International has contested this reassessment, and considers it has good chances of winning the dispute.

47.2 LABOUR LITIGATION

EDF is party to a number of labour lawsuits, primarily regarding working hours. EDF estimates that none of these lawsuits, individually, is likely to have a significant impact on its financial results or financial position. However, because they relate to situations that could concern a large number of EDF's employees in France, any increase in such litigations could have a potentially negative impact on the Group's financial position (although the risk has been mitigated by the signature of the agreement on fixed numbers of working days in 2016).

47.3 ENEDIS –LITIGATION WITH PHOTOVOLTAIC PRODUCERS

The French authorities' announcement in autumn 2010 of a forthcoming downward revision to photovoltaic electricity purchase prices triggered an upsurge in connection applications (since at the time the applicable tariff depended on the date at which a complete connection application was filed). Several successive ministerial decisions were issued reducing purchase prices.

As these price decreases were not sufficient to stem the flow of connection applications, by a decree of 9 December 2010 the Government suspended the conclusion of new contracts for a three-month period, and stated that if the financial and technical proposal for a request had not been approved by 2 December 2010, a new connection application would have to be submitted at the end of this three-month period.

A certain number of producers who, as a result of these circumstances, lost their entitlement to the pre-moratorium purchase obligation price brought legal proceedings against EDF as operator of the distribution network in the non-interconnected zones, and against Enedis as network operator for mainland France, claiming that the electricity network operator did not issue the technical and financial connection proposals in time for them to benefit from more advantageous electricity purchase terms.

In an order of 15 March 2017, the Court of Justice of the European Union confirmed that the decisions of 10 July 2006 and 12 January 2010 setting the purchase tariffs for photovoltaic energy constitute "intervention by the State or using State resources", one of the four criteria that characterise State aid. The Court stated that such a support measure, implemented without prior notification to the European Commission, is illegal. It is now up to the national courts to act accordingly, particularly by banning application of these illegal decisions.

Several courts have found in favour of Enedis during 2018. Notably, in early July 2018 Versailles Court of Appeal dismissed 150 producers' claims, because there was no evidence establishing misconduct by Enedis, or because there was no causal link between Enedis' misconduct and the prejudice, or because the prejudice was not deemed eligible for compensation since the tariff decisions of 2006 and 2010 are illegal, as the European Commission did not receive the prior notification required by State aid control rules. Appeals have been filed before the Court of Cassation against most of these decisions.

Similarly, in recent months a certain number of court decisions have been issued in favour of EDF, considering that the producers' prejudice is not reparable because it is founded on illegal grounds.

In parallel to the compensation claims before civil courts, EDF and Enedis sought to apply their Civil Liability insurance policy, but the insurers refused their claim. The French Court of Cassation considered in a ruling of 9 June 2015 (for the Green Yellow case) that the insurance payment was due and that the network operator was at fault. Following that ruling, Enedis and EDF brought action against their insurers in April 2017, applying to the courts for formal recognition of two partial serial claims. If the courts were to recognize the existence of two partial serial claims, a single excess and a single limit would apply for all claims with the same technical cause.

47.3.1 SUN'R

On 21 June 2012, SUN'R filed a complaint against EDF and Enedis, along with an application for interim measures, with France's Competition Authority, the ADLC. SUN'R accused Enedis of delays in the procedure for connecting its photovoltaic facilities and EDF of delays in the establishment of the purchase obligation contracts and payment of the related invoices. SUN'R also claimed that EDF ENR had benefited from special treatment from Enedis for the connection of its facilities and from EDF for the payment of its invoices.

In a decision of 14 February 2013, the ADLC rejected all the applications made by SUN'R for interim measures but decided to continue the investigation on the merits of the case.

On 12 January 2018 the ADLC's investigation departments sent the parties a proposal to dismiss the matter due to the absence of anticompetitive practices by EDF, Enedis and RTE. On 4 July 2018, the ADLC closed the proceedings by issuing a decision dismissing the case. Concurrently with its complaint to the ADLC in 2012, on 29 August 2012 SUN'R filed a petition at an urgent applications hearing for expert assessment and provision for costs before the Paris Administrative Court, including a claim for provisional compensation of €1 million from EDF and €2.5 million from Enedis. By order of 27 November 2012, the urgent applications judge *(juge des référés)* at the Administrative Court of Paris dismissed this petition.

On 30 April 2015, SUN'R issued proceedings against Enedis and EDF before the Paris Commercial Court, seeking compensation for the loss allegedly caused to it by the delays in the procedure for the connecting its solar energy plant projects to the electricity distribution network. It asked the Court to suspend proceedings pending the ADLC's decision on the merits of the case, and claimed a provisional amount of €10 million to be applied against future compensation for its loss. In a ruling of 7 November 2016 the Paris Commercial Court dismissed SUN'R's claim for provisional compensation and suspended proceedings until the ADLC issues a decision on the merits of the case.

On 24 November 2015, Sun West, Azimut 56 and JB Solar issued proceedings against Enedis and EDF before the Paris Commercial Court on the same grounds. They are currently claiming almost €4 million for the alleged prejudice, but asked the Court to suspend proceedings pending the ADLC's decision on the merits of the case. In a ruling of 4 December 2017, the Paris Commercial Court rejected claims for provisional compensation made by Sun West, Azimut 56 and JB Solar and suspended proceedings until the ADLC issued a decision on the merits of the case.

That decision was announced on 4 July 2018 when the ADLC dismissed the case, without possibility of appeal. The behaviours alleged by the plaintiff are consequently considered never to have taken place. The Paris Commercial Court formally noted the withdrawal of SUN'R's action for compensation in a judgement of 10 December 2018, and the withdrawal of the claims by Sun West, Azimut 56 and JB Solar in a further judgement of 12 December 2018. This matter is thus definitively closed.

NOTE 48 RELATED PARTIES

Details of transactions with related parties are as follows:

	Associates and joint ventures		Joint operations		French State or State-owned entities [1]		Group Total	
(in millions of euros)	**31/12/2018**	31/12/2017	**31/12/2018**	31/12/2017	**31/12/2018**	31/12/2017	**31/12/2018**	31/12/2017
Sales	560	580	-	-	1,708	1,549	2,268	2,129
Energy purchases	4,071	3,817	5	4	2,031	2,313	6,107	6,134
External purchases	4	9	3	4	251	1,163	258	1,176
Financial assets	294	238	-	-	-	-	294	238
Other assets	730	729	-	-	486	596	1,216	1,325
Financial liabilities	-	-	-	-	-	-	-	-
Other liabilities	1,162	1,282	1	1	631	552	1,794	1,835

(1) Excluding tax and social liabilities and the CSPE receivable.

48.1 TRANSACTIONS WITH ENTITIES INCLUDED IN THE SCOPE OF CONSOLIDATION

Transactions with the principal associates (CTE, (the company that owns RTE), CENG, Taishan and Alpiq) are presented in note 23.

Transactions with other associates, joint ventures, and partner entities in joint arrangements with the Group mainly consist of sales and purchases of energy.

48.2 RELATIONS WITH THE FRENCH STATE AND STATE-OWNED ENTITIES

48.2.1 Relations with the French State

The French State holds 83.67% of the capital of EDF at 31 December 2018, and is thus entitled in the same way as any majority shareholder to control decisions that require approval by the shareholders.

In accordance with the legislation applicable to all companies having the French State as their majority shareholder, the EDF group is subject to certain inspection procedures, in particular economic and financial inspections by the State, audits by the French Court of Auditors *(Cour des Comptes)* or Parliament, and verifications by the French General Finance Inspectorate *(Inspection générale des finances).*

The public service contract between the French State and EDF was signed on 24 October 2005. This contract is intended to form the framework for public service missions assigned to EDF by the lawmaker for an unlimited period. The Law of 9 August 2004 does not stipulate the duration of the contract.

EDF, like other electricity producers, also participates in implementation of the multi-year energy programme established by the Decree of 27 October 2016, which defines objectives for generation and load shedding.

Finally, the French State intervenes through the regulation of electricity and gas markets, particularly for authorisation to build and operate generation facilities, establishment of sales tariffs for customers that have stayed on the regulated tariffs, transmission and distribution tariffs, and also determination of the ARENH price in accordance with France's Energy Code, and the system for compensation of public service charges.

48.2.2 Relations with Engie

The common service function shared by Enedis and GRDF is defined by Article L. 111-71 of the French Energy Code. Its missions in the electricity and gas distribution sector are building structures, site project management, network operation and maintenance, and metering operations. This service is not a legal entity in its own right.

Enedis and GRDF's relations in this common service are governed by an agreement that defines the scope of the service and the resulting division of costs. The agreement has an unlimited term and can be terminated at any

time subject to 18 months notice: in such a case, the parties undertake to renegotiate the agreement during the notice period. It is updated regularly.

In July 2014, Enedis and GRDF issued a joint announcement that their joint activities of meter reading and work on meter panels would be discontinued in the future. Currently, Enedis prioritises a structure consisting of regional divisions covering all its operational missions at local level. A network of smaller units is used for very local activities.

In March 2018, Enedis and GRDF decided to set up two mixed entities: UONRH-MS for employment contracts, studies and medical/social matters and OIT, the IT and telecoms operator, for all telephone and office technology activities. These two mixed entities take effect from 1 January 2019.

For Enedis, other support functions (Vehicles and Machines, Litigation and Insurance, Training and Recruitment, and Office purchases) are grouped into a Support Services division.

48.2.3 Relations with public sector entities

The EDF group's relations with public sector entities mainly concern the two entities belonging to the former AREVA group (Orano and Areva SA).

Transactions with Orano concern:

- the front-end of the nuclear fuel cycle (uranium supplies, conversion and enrichment services);
- the back-end of the nuclear fuel cycle (transportation, storage, processing and recycling services for spent fuel);

Front-end of the cycle

Several important agreements were negotiated between EDF and Orano:

- for supplies of natural uranium: Orano Mining contracts covering the period 2021-2030;
- for fluoration: a contract covering the period 2019-2030;
- for enrichment of natural uranium into uranium 235: an Orano Cycle contract for the period 2019-2030.

As part of the plan to construct two EPRs in the United Kingdom at the Hinkley Point site, on 29 September 2016 EDF and Orano signed a uranium contract with Orano Mining, and a conversion contract and enrichment contract with Orano Cycle.

Back-end of the cycle

Relations between EDF and Orano concerning transportation, processing and recycling of spent fuels are described in note 29.1.1.

48.3 MANAGEMENT COMPENSATION

The Company's key management and governance personnel are the Chairman and CEO, the members of the COMEX (Executive Committee) throughout 2018 or since their date of appointment if they joined the COMEX during the year, and the Directors. Directors representing the employees receive no remuneration for their services.

The total compensation paid by EDF and controlled companies to the Group's key management and governance personnel amounted to €12.4 million in 2018 (€12.2 million in 2017). This amount covered short-term benefits (basic salaries, performance-related salary, profit share and benefits in kind), special IEG post-employment benefits where relevant, and the corresponding employer contributions, plus any director's fees.

EDF's key management and governance personnel benefit from no special pension system, starting bonus or severance payment entitlement except by contractual negotiation. EDF's Chairman and CEO could benefit from a termination indemnity if his term of office were ended.

NOTE 49 ENVIRONMENT

49.1 GREENHOUSE GAS EMISSION RIGHTS

In ratifying the Kyoto Protocol Europe made a commitment to reduce its greenhouse gas emissions. EU Directive 2003/87/EC set up a greenhouse gas emission quota system for the European Union which has been in operation since 1 January 2005.

This system was incorporated into national laws. Among other things it requires obligated actors, which is the case of EDF, to surrender to the State a number of greenhouse gas emission credits each year, corresponding to their emissions for the year. This Directive came into effect in 2005 for an initial three-year period, followed by a second period from 2008 to 2012, with progressive reduction of the emission rights allocated.

One of the main features of the third phase, running from 2013 to 2020, is the discontinuation of free allocation of emission rights in certain countries, including France and United Kingdom.

In the EDF group, the entities subject to this Directive are EDF, EDF Energy, Edison, Dalkia, and EDF Luminus.

In 2018, the Group surrendered 30 million tonnes in respect of emissions generated in 2017. In 2017, the Group surrendered 38 million tonnes in respect of emissions generated in 2016.

The Group's total emission rights allocation for 2018 recorded in the national registers is 1 million tonnes (3 million tonnes for 2017).

The volume of emissions at 31 December 2018 stood at 24 million tonnes (40 million tonnes for 2017). The provision resulting from over-quota emissions amounts to €175 million at 31 December 2018 (€120 million at 31 December 2017).

49.2 ENERGY SAVINGS CERTIFICATES

In all its subsidiaries, the Group is engaged in a process to control energy consumption through various measures developed by national legislations, in application of European Union Directives.

In France, the Law of 13 July 2005 introduced a system of energy savings certificates. Suppliers of energy (electricity, gas, heat, cold, domestic fuel oil and fuel for vehicles) with sales above a certain level are subject to energy savings obligations for a three-year period. They fulfil these obligations by making direct or indirect energy savings rewarded by certificates, or by purchasing energy savings certificates. At the end of the set period, the entities concerned must provide evidence of compliance with obligations by surrendering the certificates, or pay a fine to the Treasury.

In application of Article 30 of the Law of 17 August 2015 on the energy transition for green growth, a new additional energy savings obligation for 2016-2017 applies from 1 January 2016, for the benefit of households in situation of energy poverty. This new obligation is added to the energy savings obligations for the third period. The annual volume of the obligation is proportional to the annual energy savings obligation.

A fourth three-year period of energy savings obligations began on 1 January 2018 (see note 4.6).

49.3 RENEWABLE ENERGY CERTIFICATES

In application of EU Directive 2009/28/EC on the promotion of the use of energy from renewable sources, every EU member state has set national targets for consumption of electricity from renewable sources.

There are two ways for States to meet these targets:

- incorporating the costs of generating such electricity into the sale price for electricity (this is the approach taken in France);
- introducing a renewable energy certificate system (as is the case in the United Kingdom and Belgium).

The renewable energy certificates system may apply to:

- non-obligated electricity producers when the obligation applies to energy sales (EDF Renewables);

- obligated electricity producers when the obligation applies to generation;
- producers who are also sellers of electricity when the obligation applies to energy sales (EDF Energy, EDF Luminus).

Through the renewable energy certificates scheme, the EDF group has an obligation to surrender renewable energy certificates, particularly in the United Kingdom and Belgium.

At 31 December 2018, a provision of €962 million was booked in connection with the obligation to surrender renewable energy certificates at that date, essentially concerning EDF Energy (United Kingdom) and EDF Luminus (Belgium). A large portion of these obligations is covered by purchases of certificates included in intangible assets.

NOTE 50 SUBSEQUENT EVENTS

No development have occurred since the year-end in addition to those presented in other notes.

NOTE 51 SCOPE OF CONSOLIDATION AT 31 DECEMBER 2018

The Group's activities are defined as follows:

- **"Generation/Supply"** (G)**:** energy generation and energy sales to industry, local authorities, small businesses and residential consumers. This segment also includes EDF's commodity trading activities;
- **"Distribution"** (D)**:** management of the low and medium-voltage public electricity distribution networks;
- **"Transmission"** (T): operation, maintenance and development of the high-voltage and very-high-voltage electricity transmission networks;
- **"Reactors and Services (Framatome)"** (R): services and production of equipment and fuel for nuclear reactors;
- **"Other"** (O)**:** energy services (district heating, thermal energy services, etc.) for industry and local authorities, and new businesses mainly aimed at boosting electricity generation through cogeneration and renewable energy sources (e.g. wind turbines, photovoltaic panels, etc.). This activity also includes EDF Invest's holding companies and entities that are classified as dedicated assets.

51.1 FULLY CONSOLIDATED COMPANIES

		Percentage of ownership at 31/12/2018	Percentage of ownership at 31/12/2017	Business sector
France–Generation and Supply				
Electricité de France – Parent Company		100.00	100.00	G,D,O
Group Support Services (G2S)		100.00	100.00	O
Edvance		95.10	95.10	O
Société pour le Conditionnement des Déchets et Effluents Industriels (SOCODEI)		100.00	100.00	O
CHAM SAS		100.00	100.00	O
Sowee		100.00	100.00	O
Immo C47		51.00	100.00	O
Other holding companies (EDF Invest)		100.00	100.00	O
France – Regulated activities				
Enedis		100.00	100.00	D
Electricité de Strasbourg		88.64	88.64	G, D
EDF Production Electrique Insulaire (EDF PEI)		100.00	100.00	G
Framatome				
Framatome	France	75.50	75.50	R
United Kingdom				
EDF Energy Holdings Limited (EDF Energy)		100.00	100.00	G, O
EDF Energy UK Ltd.		100.00	100.00	O
EDF Development Company Ltd.		100.00	100.00	O
Italy				
Edison SpA (Edison)		97.45	97.45	G, O
Transalpina di Energia SpA (TdE SpA)		100.00	100.00	O
Other international				
EDF International SAS	France	100.00	100.00	O
EDF Belgium SA	Belgium	100.00	100.00	G
EDF Luminus SA	Belgium	68.63	68.63	G, O
EDF Norte Fluminense SA	Brazil	100.00	100.00	G
Ute Paracambi SA	Brazil	100.00	100.00	G
French Investment Guangxi Laibin Electric Power Co, Ltd. (Figlec)	China	100.00	100.00	G
EDF (China) Holding Ltd.	China	100.00	100.00	O
EDF Inc.	USA	100.00	100.00	O
Unistar Nuclear Energy LLC (1)	USA	-	100.00	G
EDF Alpes Investissements SARL	Switzerland	100.00	100.00	O
Mekong Energy Company Ltd. (MECO)	Vietnam	56.25	56.25	G
EDF Chile Spa	Chile	100.00	100.00	G

Business segments: G = Generation, D = Distribution, T = Transmission, R = Reactors, O = Other
(1) Unistar has been merged into EDF Inc.

EDF Renewables		Percentage of ownership at 31/12/2018	Percentage of ownership at 31/12/2017	Business sector
EDF Renewables (formerly EDF Energies Nouvelles)	France	100.00	100.00	G,O
Dalkia				
Dalkia	France	99.94	99.94	O
Other activities				
EDF Développement Environnement SA	France	100.00	100.00	O
Société Française d'Ingénierie Electronucléaire et d'Assistance (SOFINEL)	France	88.98	88.98	O
Dunkerque LNG (1)	France	-	65.01	O
EDF IMMO and real estate subsidiaries	France	100.00	100.00	O
Société C2	France	100.00	100.00	O
Société C3	France	100.00	100.00	O
EDF Holding SAS	France	100.00	100.00	O
Citelum	France	100.00	100.00	O
EDF Trading Ltd.	UK	100.00	100.00	O
EDF DIN UK Ltd. (2)	UK	-	100.00	O
Wagram Insurance Company DAC	Ireland	100.00	100.00	O
EDF Investissements Groupe SA	Belgium	93.89	93.89	O
Océane Re	Luxembourg	99.98	99.98	O
EDF Gas Deutschland GmbH	Germany	100.00	100.00	O

Business segments: G = Generation, D = Distribution, T = Transmission, R = Reactors, O = Other.
(1) Dunkerque LNG was sold on 30 October 2018 (see note 3.3).
(2) EDF DIN UK Ltd has been liquidated.

51.2 COMPANY HELD IN THE FORM OF A JOINT OPERATION

Other activities		Percentage of ownership at 31/12/2018	Percentage of ownership at 31/12/2017	Business sector
Friedeburger Speicherbetriebsgesellschaft GmbH (Crystal)	Germany	50.00	50.00	O

Business segments: G = Generation, D = Distribution, T = Transmission, R = Reactors, O = Other.

51.3 COMPANIES ACCOUNTED FOR BY THE EQUITY METHOD

France –Generation and Supply		Percentage of ownership at 31/12/2018	Percentage of ownership at 31/12/2017	Business sector
Domofinance	France	45.00	45.00	O
CTE (EDF Invest)[1]	France	50.10	50.10	O
Elisandra IV (Madrileña Red de Gas Holding) (EDF Invest)	Spain	20.00	20.00	O
Alba Real Estate SCS (EDF Invest)	Luxembourg	46.50	46.50	O
Géosel Manosque (EDF Invest)	France	38.35	38.35	O
Transport Stockage Hydrocarbures (TSH) (EDF Invest)	France	50.00	50.00	O
Central Sicaf (EDF Invest)	Italy	24.50	20.00	O
Thyssengaz (EDF Invest)	Germany	50.00	50.00	O
Aéroports Côte d'Azur (EDF Invest)	France	19.40	19.40	O
Ecowest SCI A and B (EDF Invest)	France	50.00	-	O
Fallago Rig (EDF Invest)	United Kingdom	20.00	-	G
Fenland Wind Farm (EDF Invest)	United Kingdom	20.00	-	G
Other international				
Compagnie Énergétique de Sinop (CES)	Brazil	51.00	51.00	G
Constellation Energy Nuclear Group LLC (CENG)	USA	49.99	49.99	G
SLOE Centrale Holding BV	Netherlands	50.00	50.00	G
Shandong Zhonghua Power Company, Ltd.	China	19.60	19.60	G
Datang Sanmenxia Power Generation Co., Ltd.	China	35.00	35.00	G
Taishan Nuclear Power Joint Venture Company Ltd. (TNPJVC)	China	30.00	30.00	G
Jiangxi Datang International Fuzhou Power Generation Company Ltd.	China	49.00	49.00	G
Nam Theun 2 Power Company (NTPC) (EDF Invest) [2]	Laos	40.00	40.00	G
Alpiq	Switzerland	25.04	25.04	G,D,T,O

Business segments: G = Generation, D = Distribution, T = Transmission, R = Reactors, O = Other
n.a: not applicable.

(1) Coentreprise de Transport d'Electricité or CTE, the company holding 100% of RTE.
(2) NPTC was partly allocated to dedicated assets in 2018.

51.4 COMPANIES IN WHICH THE EDF GROUP'S VOTING RIGHTS DIFFER FROM ITS PERCENTAGE OWNERSHIP

The percentage of voting rights, which is decisive for assessing control, differs from the Group's percentage ownership for the following entities:

	Percentage of ownership at 31/12/2018	Percentage of voting rights at 31/12/2018
Edison SpA	97.45	99.48
EDF Investissements Groupe SA	93.89	50.00

NOTE 52 STATUTORY AUDITORS' FEES

The following table sets forth the fees paid for work done by the Statutory Auditors and their network during 2018:

(in thousands of euros)	Deloitte network		KPMG network	
	Amount (excluding taxes)	%	Amount (excluding taxes)	%
Audit –Statutory audit, certification, review of company and consolidated accounts				
EDF	3,133	21.1	2,954	18.2
Controlled entities [1]	7,249	48.8	10,839	66.9
Sub-total	10,382	69.9	13,793	85.1
Non-audit services [2]				
EDF	397	2.7	772	4.8
Controlled entities [1]	4,071	27.4	1,640	10.1
Sub-total	4,468	30.1	2,412	14.9
TOTAL	14,850	100	16,204	100

(1) Fully consolidated subsidiaries and jointly controlled entities whose auditors' fees are included in the consolidated income statement.
(2) Services required by laws and regulations, and services supplied at the request of the Group. Non-audit services mainly correspond to (i) certifications of financial and accounting information or Independent Reports on social, environmental and societal information required under Article L. 225-102-1 of the French Commercial Code, (ii) services relating to disposals of entities, (iii) tax services authorised by local legislation, and (iv) operating process reviews and information system consulting services that are unrelated to the production of accounting and financial information.

Statutory Auditors' fees for 2017

The following table sets forth the fees paid for work done by the Statutory Auditors and their network during 2017:

(in thousands of euros)	Deloitte network		KPMG network	
	Amount (excluding taxes)	%	Amount (excluding taxes)	%
Audit –Statutory audit, certification, review of company and consolidated accounts				
EDF	3,103	22.1	3,012	19.7
Controlled entities	5,133	36.4	10,024	65.6
Sub-total	8,236	58.5	13,036	85.3
Non-audit services				
EDF	906	6.4	778	5.1
Controlled entities	4,944	35.1	1,473	9.6
Sub-total	5,850	41.5	2,251	14.7
TOTAL	14,086	100	15,287	100