CONSOLIDATED FINANCIAL STATEMENTS

AT 31 DECEMBER 2020

CONSOLIDATED INCOME STATEMENT

(in millions of euros)	Notes	2020	2019 [1]
Sales	5.1	69,031	71,347
Fuel and energy purchases	5.2	(32,425)	(35,091)
Other external expenses[2]		(8,461)	(8,625)
Personnel expenses	5.3	(13,957)	(13,797)
Taxes other than income taxes		(3,797)	(3,798)
Other operating income and expenses	5.4	5,783	6,687
Operating profit before depreciation and amortisation	**5**	**16,174**	**16,723**
Net changes in fair value on energy and commodity derivatives, excluding trading activities	6	(175)	642
Net depreciation and amortisation[3]		(10,838)	(10,020)
(Impairment)/reversals	10.8	(799)	(403)
Other income and expenses	7	(487)	(185)
Operating profit		**3,875**	**6,757**
Cost of gross financial indebtedness	8.1	(1,610)	(1,806)
Discount effect	8.2	(3,733)	(3,161)
Other financial income and expenses	8.3	2,761	4,603
Financial result	**8**	**(2,582)**	**(364)**
Income before taxes of consolidated companies		**1,293**	**6,393**
Income taxes	9	(945)	(1,532)
Share in net income of associates and joint ventures	12	425	818
Net income of discontinued operations	3.2	(158)	(497)
CONSOLIDATED NET INCOME		**615**	**5,182**
EDF net income		**650**	**5,155**
EDF net income – continuing operations		804	5,639
EDF net income – discontinued operations		(154)	(484)
Net income attributable to non-controlling interests		**(35)**	**27**
Net income attributable to non-controlling interests – continuing operations		(31)	40
Net income attributable to non-controlling interests – discontinued operations		(4)	(13)
Earnings per share (EDF share) in euros:	**14.7**		
Basic earnings per share		0.05	1.50
Diluted earnings per share		0.05	1.50
Basic earnings per share of continuing operations		0.1	1.67
Diluted earnings per share of continuing operations		0.1	1.67

[1] In application of IFRS 5, the net income of discontinued operations is presented on a separate line of the income statement for the financial periods presented. The impact of application of IFRS 5 on the published figures for 2019 is presented in note 1.4.2.

[2] Other external expenses are reported net of capitalised production costs.

[3] Including net increases in provisions for renewal of property, plant and equipment operated under concessions.

CONSOLIDATED STATEMENT OF COMPREHENSIVE INCOME

(in millions of euros)	Notes	2020 EDF net income	2020 Net income attributable to non-controlling interests	2020 Total	2019 EDF net income	2019 Net income attributable to non-controlling interests	2019 Total
Consolidated net income		**650**	**(35)**	**615**	**5,155**	**27**	**5,182**
Fair value of cash flow hedges							
Fair value of cash flow hedges - gross change	18.7.5	(711)	(8)	(719)	786	(55)	731
Fair value of cash flow hedges - tax effects		210	3	213	(235)	2	(233)
Fair value of net investment hedges							
Fair value of net investment hedges - gross change	18.7.5	661	-	661	32	-	32
Fair value of net investment hedges - tax effects		(30)	(-)	(30)	(132)	(-)	(132)
Change in fair value of debt instruments							
Gross change in fair value of debt instruments	18.1.2	20	-	20	293	-	293
Related tax effect		10	(-)	10	(93)	(-)	(93)
Translation adjustments – controlled entities		**(1,425)**	**(430)**	**(1,855)**	**732**	**357**	**1,089**
Share in net income of associates and joint ventures – items that can be recycled to profit and loss		**(561)**	**-**	**(561)**	**97**	**-**	**97**
Gains and losses recorded in equity with recycling		***(1,826)***	***(435)***	***(2,261)***	***1,480***	***304***	***1,784***
Change in fair value of equity instruments							
Gross change in fair value of equity instruments	18.1.2	(34)	(4)	(38)	(22)	-	(22)
Related tax effect		-	-	-	-	-	-
Change in actuarial gains and losses on post-employment benefits							
Gross change in actuarial gains and losses on post-employment benefits	16.1.3	(983)	80	(903)	(2,501)	39	(2,462)
Related tax effect		(220)	(18)	(238)	(62)	(7)	(69)
Share in net income of associates and joint ventures – items that cannot be recycled to profit and loss		**(109)**	**-**	**(109)**	**(153)**	**-**	**(153)**
Gains and losses recorded in equity with no recycling		***(1,346)***	***58***	***(1,288)***	***(2,738)***	***32***	***(2,706)***
Total gains and losses recorded in equity		**(3,172)**	**(377)**	**(3,549)**	**(1,258)**	**336**	**(922)**
CONSOLIDATED COMPREHENSIVE INCOME		(2,522)	(412)	(2,934)	3,897	363	4,260
Comprehensive income of continuing operations		(2,368)	(408)	(2,776)	4,337	375	4,712
Comprehensive income of discontinued operations		(154)	(4)	(158)	(440)	(12)	(452)

CONSOLIDATED BALANCE SHEET

ASSETS *(in millions of euros)*	Notes	31/12/2020	31/12/2019
Goodwill	10.1	10,265	10,623
Other intangible assets	10.2	9,583	9,350
Property, plant and equipment used in generation and other tangible assets owned by the Group, including right-of-use assets	10.3	92,600	89,099
Property, plant and equipment operated under French public electricity distribution concessions	11	60,352	58,413
Property, plant and equipment operated under concessions other than French public electricity distribution concessions	10.5	6,858	6,860
Investments in associates and joint ventures	12	6,794	6,414
Non-current financial assets	18.1	47,615	46,219
Other non-current receivables	13.3.4	2,015	1,930
Deferred tax assets	9.3	1,150	557
Non-current assets		**237,232**	**229,465**
Inventories	13.2	14,738	14,049
Trade receivables	13.3	14,521	15,606
Current financial assets	18.1	23,532	29,401
Current tax assets		384	286
Other current receivables	13.3.4	6,918	6,881
Cash and cash equivalents	18.2	6,270	3,934
Current assets		**66,363**	**70,157**
Assets classified as held for sale	3.2	2,296	3,662
TOTAL ASSETS		305,891	303,284

EQUITY AND LIABILITIES *(in millions of euros)*	Notes	31/12/2020	31/12/2019
Capital	14	1,550	1,552
EDF net income and consolidated reserves		44,083	44,914
Equity (EDF share)		***45,633***	***46,466***
Equity (non-controlling interests)	14.6	9,593	9,324
Total equity	**14**	**55,226**	**55,790**
Provisions related to nuclear generation – back-end of the nuclear cycle, plant decommissioning and last cores	15	58,333	55,583
Provisions for employee benefits	16	22,130	20,539
Other provisions	17	5,374	4,638
Non-current provisions		***85,837***	***80,760***
Special French public electricity distribution concession liabilities	11.2	48,420	47,465
Non-current financial liabilities	18.3	55,899	57,002
Other non-current liabilities	13.5	4,874	4,928
Deferred tax liabilities	9.3	3,115	2,295
Non-current liabilities		**198,145**	**192,450**
Current provisions	15, 17 and 16.1	5,827	5,556
Trade payables	13.4	11,900	12,867
Current financial liabilities	18.3	17,609	18,535
Current tax liabilities		215	433
Other current liabilities	13.5	16,861	16,610
Current liabilities		**52,412**	**54,001**
Liabilities related to assets classified as held for sale	3.2	108	1,043
TOTAL EQUITY AND LIABILITIES		305,891	303,284

CONSOLIDATED CASH FLOW STATEMENT

(in millions of euros)	Notes	2020	2019 [1]
Operating activities:			
Consolidated net income		**615**	**5,182**
Net income of discontinued operations		**(158)**	**(497)**
Net income of continuing operations		**773**	**5 679**
Impairment/(reversals)		799	403
Accumulated depreciation and amortisation, provisions and changes in fair value		13,310	8,358
Financial income and expenses		785	101
Dividends received from associates and joint ventures		433	349
Capital gains/losses		(185)	(508)
Income taxes		945	1,532
Share in net income of associates and joint ventures		(425)	(818)
Change in working capital	13.1.2	(1,679)	475
Net cash flow from operations		***14,756***	***15,571***
Net financial expenses disbursed		(1,008)	(802)
Income taxes paid		(983)	(915)
Net cash flow from continuing operating activities		**12,765**	**13,854**
Net cash flow from operating activities relating to discontinued operations		**98**	**168**
Net cash flow from operating activities		**12,863**	**14,022**
Investing activities:			
Acquisitions of equity investments, net of cash acquired		(126)	(456)
Disposals of equity investments, net of cash transferred		498	293
Investments in intangible assets and property, plant and equipment	10.7	(16,007)	(16,797)
Net proceeds from sale of intangible assets and property, plant and equipment		54	94
Changes in financial assets		2,797	1,294
Net cash flow from continuing investing activities		**(12,784)**	**(15,572)**
Net cash flow from investing activities relating to discontinued operations		**(104)**	**(78)**
Net cash flow from investing activities		**(12,888)**	**(15,650)**
Financing activities:			
Transactions with non-controlling interests[2]		1,019	1,055
Dividends paid by parent company	14.3	(-)	(58)
Dividends paid to non-controlling interests		(267)	(155)
Purchases/sales of treasury shares		5	(14)
Cash flows with shareholders		***757***	***828***
Issuance of borrowings	18.3.2.1	6,601	9,080
Repayment of borrowings	18.3.2.1	(7,062)	(6,976)
Issuance of perpetual subordinated bonds and OCEANEs	14.4 and 14.5	2,243	493
Redemptions of perpetual subordinated bonds		(-)	(1,280)
Payments to bearers of perpetual subordinated bonds	14.4	(501)	(589)
Funding contributions received for assets operated under concessions and investment subsidies		534	686
Other cash flows from financing activities		***1,815***	***1,414***
Net cash flow from continuing financing activities		**2,572**	**2,242**
Net cash flow from financing activities relating to discontinued operations		**19**	**(19)**
Net cash flow from financing activities		**2,591**	**2,223**
Net cash flow from continuing operations		2,553	524
Net cash flow from discontinued operations		13	71
Net increase/(decrease) in cash and cash equivalents		**2,566**	**595**
CASH AND CASH EQUIVALENTS - OPENING BALANCE		**3,934**	**3,290**
Net increase/(decrease) in cash and cash equivalents		2,566	595
Currency fluctuations		(162)	(5)
Financial income on cash and cash equivalents		35	17
Other non-monetary changes		(103)	37
CASH AND CASH EQUIVALENTS - CLOSING BALANCE	**18.2**	**6,270**	**3,934**

[1] *The published figures for 2019 have been restated due to the impact of the change in the scope of E&P operations (see note 1.4.2).*

[2] *Contributions via capital increases, or capital reductions and acquisitions of additional interests or disposals of interests in controlled companies. In 2020, this item includes an amount of €998 million relating to CGN's payment for the capital increases by NNB Holding Ltd (for the Hinkley point C project) and Sizewell C Holding Co.. In 2019, this item includes an amount of €967 million relating to CGN's payment for the capital increases by NNB Holding Ltd. (for the Hinkley Point C project) and Sizewell C Holding Co..*

CHANGE IN CONSOLIDATED EQUITY

Details of the change in equity between 1 January and 31 December 2020 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 restated under IFRIC 23 at 01/01/2019	**1,505**	**(56)**	**215**	**(1,856)**	**44,651**	**44,459**	**8,177**	**52,636**
Gains and losses recorded in equity	-	-	822	658	(2,738)	(1,258)	336	(922)
Net income	-	-	-	-	5,155	5,155	27	5,182
Consolidated comprehensive income	**-**	**-**	***822***	***658***	***2,417***	***3,897***	***363***	***4,260***
Payments on perpetual subordinated bonds	-	-	-	-	(589)	(589)	-	(589)
Issuance/Redemption of perpetual subordinated bonds	(-)	(-)	(-)	(-)	(1,125)	(1,125)	(-)	(1,125)
Dividends paid	(-)	(-)	(-)	(-)	(941)	(941)	(155)	(1,096)
Purchases/sales of treasury shares	-	(8)	-	-	-	(8)	-	(8)
Capital increase by EDF (see note 14.1)	47	-	-	-	834	881	-	881
Other changes[4]	-	-	-	-	(108)	(108)	939	831
Equity as published at 31/12/2019	**1,552**	**(64)**	**1,037**	**(1,198)**	**45,139**	**46,466**	**9,324**	**55,790**
Gains and losses recorded in equity	-	-	(1,908)	82	(1,346)	(3,172)	(377)	(3,549)
Net income	-	-	-	-	650	650	(35)	615
Consolidated comprehensive income	**-**	**-**	***(1,908)***	***82***	***(696)***	***(2,522)***	***(412)***	***(2,934)***
Payments on perpetual subordinated bonds	-	-	-	-	(501)	(501)	-	(501)
Issuance/Redemption of perpetual subordinated bonds and OCEANEs (see notes 14.4 and 15)	-	-	-	-	2,207	2,207	-	2,207
Dividends paid	(-)	(-)	(-)	(-)	(-)	(-)	(271)	(271)
Purchases/sales of treasury shares	-	1	-	-	-	1	-	1
Capital decrease by EDF (see note 14.1)	(2)	53	-	-	(51)	-	-	-
Other changes[5]	-	-	-	-	(18)	(18)	952	934
EQUITY AT 31/12/2020	**1,550**	**(10)**	**(871)**	**(1,116)**	**46,080**	**45,633**	**9,593**	**55,226**

[1] Changes in translation adjustments amount to €(1,908) million at 31 December 2020. This variation is due to the depreciation of the pound sterling and the dollar 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 this column.

[4] In 2019, "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 €967 million.

[5] In 2020, "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 €998 million.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

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 (22-30 avenue de Wagram, 75008 Paris).

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 2020.

The Group is an integrated energy operator engaged in all aspects of the energy business: power generation (nuclear power, hydropower, wind and solar power, thermal energy, etc.), transmission, distribution, supply, trading, energy services, production of equipment and fuel assemblies, and reactor services.

The Group's consolidated financial statements at 31 December 2020 were prepared under the responsibility of the Board of Directors and approved by the Directors at the Board meeting held on 17 February 2021. They will become final after approval at the General Shareholders' Meeting to be held on 6 May 2021.

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 2020 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 2020. 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 2020.

1.2 CHANGES IN ACCOUNTING STANDARDS

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

The accounting and valuation methods applied by the Group in the consolidated financial statements at 31 December 2020 are identical to those used in the consolidated financial statements at 31 December 2019, with the exception of the changes presented below in notes 1.2.1, 1.2.2 and 1.2.3. Information is also given on the standards, amendments and interpretations adopted by the European Union that are applicable from 1 January 2021 (note 1.2.4), and released by the IASB but not yet adopted by the European Union (note 1.2.5).

For purposes of clarity, the accounting principles and methods used are now described in individual notes to the financial statements.

1.2.1 Business Combinations - Amendments to IFRS 3: Definition of business

These amendments, adopted by European Union on 21 April 2020, applicable to business combinations taking place from 1 January 2020, aim to clarify the distinction between the purchase of a business and the purchase of a group of assets. They allow the use of a concentration test to determine if an entity has acquired a single identifiable asset or group of similar identifiable assets rather than a business (or operation), based on whether substantially all of the fair value of the gross assets acquired is concentrated in a single asset (or a group of similar assets). The Group applies this test to certain acquisitions, with no impact on its financial statements at 31 December 2020.

1.2.2 Interest Rate Benchmark Reform - Amendments to IFRS 9, IAS 39 and IFRS 7 (phase 1)

The current benchmark interest rates (IBOR - Interbank Offered Rates) will be replaced by new alternative benchmarks (Risk Free Rates), some of which will take effect in 2021. This reform is particularly likely to affect certain commercial contracts (e.g. late payment penalties on supplier or customer contracts) and financial instruments (loans and receivables, borrowings, valuation of leases, derivatives). The principal rates concerned by the reform that are used by the Group are Euribor, Libor USD and Libor GBP.

The IASB has published several amendments to IFRS 9, IAS 39 and IFRS 7 that limit the impacts of the interest rate benchmark reform for issuers. The amendments to IFRS 9, IAS 39 and IFRS 7 for phase 1 of the reform, adopted on 15 January 2020 by European union and applicable since 1 January 2020, allow continuation of hedge accounting until the transition to the new interest rates is effective, and entail no impact on the Group's 2020 financial statements.

1.2.3 Covid-19-Related Rent Concessions - Amendments to IFRS 16

These amendments concern the treatment by the lessee of relief granted by the lessor on a current lease as a direct result of the Covid-19 pandemic, in the form of "payment holidays" or temporary rent reductions (for payments up to 30 June 2021 at the latest). Provided there is no substantial modification of the terms of the lease, the lessee is allowed by these amendments not to re-estimate the lease liability using a revised discount rate, with a corresponding adjustment to the right-of-use asset, and not to defer the value of the relief through amortisation of the right-of-use asset. The lessee can therefore opt to record the impact directly in profit and loss.

Application from 1 June 2020 of these amendments, which were adopted by the European Union on 9 October 2020, has no material impact on the Group's financial statements.

1.2.4 Standards adopted by the European Union and applicable for financial years beginning on or after 1 January 2021

Interest rate benchmark reform – Amendments to IFRS 9, IAS 39, IFRS 7, IFRS 4 and IFRS 16 (Phase 2)

The amendments to IFRS 9, IAS 39, IFRS 7, IFRS 4 and IFRS 16 for phase 2 of this reform were adopted on 13 January 2021 and are applicable for financial years beginning on or after 1 January 2021 (with retrospective application).

They state that in the event of modification of contractual terms as a direct consequence of the interest rate benchmark reform, and in application of paragraph B5.4.5 of IFRS 9, there is no immediate impact on profit and loss for the year.

A working team has been set up to identify all instruments for each reference interest rate that could be affected by this reform, organise the contractual, organisational and IT aspects of the transition, and introduce appropriate accounting treatments. At the year-end the Group has not identified any events requiring early application, even partial, of the phase 2 amendments.

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

Property, Plant and Equipment - Proceeds before Intended Use - Amendments to IAS 16

These amendments modify the treatment of proceeds from selling items produced by an asset before it is ready for its intended use, by prohibiting deduction of those proceeds from the cost of the asset. Such proceeds and the associated costs must instead be recognised in profit and loss.

Subject to adoption by the European Union, these amendments are expected to be applicable from 1 January 2022 and would concern the Group's projects for construction of energy generation assets (particularly Flamanville 3).

Onerous Contracts — Cost of Fulfilling a Contract - Amendments to IAS 37

These amendments clarify the nature of the costs to be included in the cost of fulfilling a contract when assessing whether a contract is onerous. They mainly concern incremental costs such as direct labour and materials, and other costs relating directly to the contract, such as allocation of the depreciation charge for a tangible asset that is used in fulfilling the contract.

The Group does not currently anticipate any material impact to result from these amendments, which are expected to be applicable from 1 January 2022.

Other standards, amendments and interpretations

The Group does not currently anticipate any material impact to result from changes introduced by the "Annual improvements – 2018-2020 cycle" which are expected to be applicable from 1 January 2022.

1.3 BASIS FOR PREPARATION OF THE 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 Translation methods

1.3.2.1 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.

1.3.2.2 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.

1.3.2.3 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.

1.3.3 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.

1.3.4 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 volatility on the financial and energy markets, 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:

1.3.4.1 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 where both reactors were permanently shut down in the first half of 2020) since all the technical, economic and governance conditions were fulfilled. The depreciation period of other series (1300MW and 1450MW), which are more recent, is currently unchanged at 40 years.

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

The Tricastin plant's reactor 1 was reconnected to the grid on 23 December 2019 after the fourth 10-year inspection. This was the first 900MW series unit to pass the 40-year mark.

The fourth 10-year inspections of units 2 and 4 at Bugey began in 2020 (respectively early and late in the year), and the number of ten-year inspections to be conducted simultaneously in 2021 has increased to 5.

The ASN's decision setting the technical prescriptions applicable to 900MW series reactors, in view of the conclusions of the "generic" phase of the fourth periodic review, is expected to be issued by the end of February 2021.

Following the final adoption of France's multi-year energy programme (PPE) in April 2020 (see note 2), the Group's financial statements at 31 December 2020 include the impact of the two early reactor shutdowns to take place in 2027 and 2028 before they reach fifty years of operation. Depreciation plans have been accelerated from 1 July 2020, based on the various possible shutdown scenarios, as the decision regarding which reactors should be shut down does not have to be made yet. Nuclear provisions were re-estimated accordingly at 30 June 2020 (see note 15.1.1.3).

1.3.4.2 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.

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 2020 are appropriate and justified. However, any future change in assumptions could have a significant impact on the Group's balance sheet and income statement (see note 15).

For France, the main assumptions and sensitivity analyses relating to EDF's nuclear provisions are presented in note 15.1.1.5.

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 long-term 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 the contractual terms for spent fuel management;
- changes in certain financial parameters such as discount rates or inflation rates;
- the depreciation period of nuclear facilities (calculation of decommissioning provisions for nuclear plants in operation is based on the depreciation period of the assets concerned, i.e. 50 years for 900MW series power plants and 40 years for 1300MW series and N4 series power plants).

1.3.4.3 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 2020 are presented in note 16. These assumptions are updated annually. The Group considers the actuarial assumptions used at 31 December 2020 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 16.

1.3.4.4 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 10.8.

1.3.4.5 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.

1.3.4.6 Energy supplied but not yet measured and billed

As explained in note 5.1, 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.

1.3.4.7 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 concession-granting authorities in the annual business reports (see note 11). Measurement of the concession liability concerning assets to be replaced is notably subject to unforeseeable developments in terms of costs, the useful life of assets and disbursement dates.

1.3.4.8 Deferred tax assets

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

1.3.4.9 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 15.1.2.4). 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 securities, in application of IFRS 9.

  Furthermore, through its subsidiary Edison, since 2014 the Group has held a 30% investment in E2i Energie Speciali (formerly Edens), with F2i. However, the governance arrangements and contractual agreements introduced for E2i Energie Speciali in connection with this transaction give Edison exclusive control over the company. In application of IFRS 10, E2i Energie Speciali is therefore fully consolidated (via Edison) in the Group’s consolidated financial statements. On 14 January 2021 Edison announced the signature of one agreement with F2i for the Group’s purchase of a 70% interest in E2i Energie Speciali which is currently held by F2i. The acquisition was finalised on 16 February 2021. As E2i Energie Speciali is already fully consolidated by the Group, the acquisition of an additional 70% interest has an impact on non-controlling interests, and therefore on equity (see note 3.2) and ultimately on EDF net income.
- 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.

1.3.5 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 16) and expenses related to nuclear liabilities (principally in France − see note 15.1.2 − and the United Kingdom − see note 15.2);
- 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, Electricité de Strasbourg and Dalkia), and to a lesser extent Italy (see notes 10.5);
- the sale of Group investments in certain subsidiaries may require 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 18.3.4), and certain items of cash and cash equivalents are subject to restrictions (see note 18.2).

1.4 COMPARABILITY (INCLUDING THE EFFECT OF THE COVID-19 PANDEMIC)

1.4.1 Consequences of the Covid-19 pandemic

The economic disruption caused by the Covid-19 pandemic had significant repercussions for many of the Group's activities in 2020, particularly nuclear power, worksites, supply and services.

On 14 April 2020[1], the Group withdrew all its financial targets for 2020, including the lower threshold (€17.5 billion) for operating profit before depreciation and amortisation, and also for 2021. The Group was able to publish a new 2020 target for operating profit before depreciation and amortisation on 31 July 2020, setting a range of €15.2-15.7 billion. This was confirmed on 13 November 2020 when the third-quarter results were published, then revised upwards on 16 December 2020 to €16 billion or slightly more, given the greater clarity in the second half of the year regarding nuclear power generation in France in the crisis context.

Nuclear power generation in France

As announced in the press release of 16 April 2020[2], due to the Covid-19 crisis EDF had to make adjustments to all its activities in order to protect personnel working at its nuclear power plants. Work on the industrial maintenance programme, particularly scheduled operations during maintenance outages, was significantly affected, with a resulting reduction in the electricity generation capacity. EDF thus had to adjust its schedule of reactor outages for maintenance so as to contribute alongside the transmission operator RTE to ensuring a secure power supply throughout the winter of 2020-2021. Some reactors were consequently taken offline in order to save their fuel.

In addition, the economic slowdown during France's lockdown led to a decline of up to 20% in electricity consumption compared to normal levels[3], resulting in lower use of power plants.

Due to measures taken as a result of the Covid-19 pandemic (social distancing, organisation of employee movements, limits on the number of workers on site), work took longer to complete. Consequently, nuclear reactor outages lasted longer under the twin constraints of lower employee availability and lower productivity. The industrial maintenance programme was therefore revised to adjust scheduled work to industrial capacities, and match the number of reactors in operation to requirements of the network, particularly for the winter period of 2020-2021.

This crisis also led EDF to amend the schedule for reactor outages in future years. Reactor outages depend on complex optimisation in a field subject to many constraints, such as fuel management, compliance with regulatory requirements and scheduling work to match industrial capacities, while always ensuring a balance between supply and demand for electricity, especially in the winter period. As reactor outages are scheduled several years in advance by reference to forecast network requirements and industrial resources, deferring outages from one year to the next has a knock-on effect on the maintenance programme in subsequent years and therefore on the expected power output.

EDF's press release of 16 April 2020 consequently stated a revised estimate of annual nuclear power output in France: approximately 300TWh in 2020 (compared to between 375TWh and 390TWh as communicated on 14 February 2020), reflecting the consequences of the Covid-19 pandemic and other factors affecting availability of the nuclear fleet, and between 330TWh and 360TWh each year in 2021 and 2022.

On 2 July 2020[4] the EDF Group then announced an upward revision to this estimate of annual nuclear power output in France in 2020, to approximately 315-325TWh.

These revisions were undertaken because work resumed earlier than had been expected when the 16 April estimate was published. The duration of scheduled outages in 2020 was adjusted in view of the observed on-site conditions for the return to work. EDF was able to complete several outages of the 2020 programme during the first half of the year, and continue work on reactors still in operation, while respecting the required measures to prevent the spread of the virus, by optimising movements into and out of restricted-access areas through adjustments to the organisation of work so as to limit the number of people working on the same activity, or using work-from-home arrangements. As a result of the Covid-19 pandemic, the second half of the year began with more reactors on scheduled outages for maintenance than initially planned.

1 See the press release of 14 April 2020: Update on the consequences of the Covid-19 sanitary crisis.

2 See the press release of 16 April 2020: EDF revises its annual nuclear output forecast.

3 See rte-france.fr - L'impact de la crise sanitaire (COVID-19) sur le fonctionnement du système électrique (5 April 2020, in French only).

4 See the press release of 2 July 2020: EDF revises upwards its annual nuclear output estimate for 2020.

Thanks to better performances than expected on maintenance outages during the second half of the 2020, it was possible to re-estimate nuclear power output for the year at 325-335TWh on 13 November, then announce that it would be close to 335TWh on 16 December 2020. In the end nuclear output for 2020 stood at 335.4TWh, 44.1TWh lower than in 2019 due to the direct and indirect effects of the Covid-19 pandemic totalling 32.9TWh (modulation in response to demand and the timing of outages; constraints associated with measures to prevent the spread of the virus, affecting work during outages). As well the impacts of the pandemic, the decrease in nuclear power output compared to 2019 is mainly attributable to the shutdown of the two Fessenheim reactors, and prolongation of three complex outages.

Support for customers and suppliers

As set out in the press release of 16 April 2020[1], EDF introduced specific measures to support its customers in the context of the Covid-19 pandemic.

During France's first official public health emergency period, from 24 March to 10 July, EDF decided to guarantee the power supply for all residential customers by suspending all reductions and cut-offs of electricity and gas supplies, and all late payment penalties, until 1 September 2020, and to support customers in difficulty by offering more flexible payment terms and deadlines. The company thus took steps that went further in both scope and duration than the measures introduced by the French government (such as extending the period when tenant evictions and customer power cut-offs are banned, which normally covers the winter months, to 10 July 2020).

For business customers, EDF took all the necessary measures to grant payment deferrals requested by customers eligible for the national Solidarity Fund, in compliance with the ordinances and decrees adopted by the government. The small businesses concerned were entitled to request deferred payment of invoices falling due until the end of France's first public health emergency period (10 July 2020). The deferred amounts were spread over a 6-month period from the last day of the month following that date.

The French government then declared a public health emergency period from 17 October 2020, initially until February 2021 but which could be extended to 1 June 2021. For residential customers, EDF took further measures in addition to the standard winter ban on evictions and power cut-offs that begins in France on 1 November: to protect customers in difficulty, EDF decided to suspend all power reductions until 15 January 2021, not to apply late payment penalties to invoices issued during the period, and to allow customers extended payment deadlines. The higher risk of non-recovery associated with these measures is incorporated into calculation of the provisions for customer receivables at 31 December 2020 (see note 13.3). For business customers, EDF was prepared to allow deferred payment on invoices as required by the French law of October 2020 on the Covid-19 emergency as soon as its application decree defining the scope of customers concerned was published. As that decree has not yet been published, debt collection on the business customer segment remained in line with normal laws and no specific measure has been applied by EDF.

In addition, as explained in the press release of 2 April 2020[2], to support its very small, small and medium-sized suppliers in the economic slowdown caused by the pandemic, the Group decided to settle its suppliers' invoices sooner than the contractual 60-day period in France. This initially applied to completed services that had been validated by EDF at 31 March 2020: EDF SA paid its very small suppliers by mid-April and its small and medium-sized suppliers by the end of April, with no intervention required of the supplier. Enedis also took equivalent measures. The first wave of faster payments concerned more than twenty thousand invoices amounting to a total of around €190 million for the entire Group in France. The practice was then progressively extended until the end of the first half-year, in line with the first emergency period which ended on 10 July 2020. In the period from April to June 2020, the Group thus settled nearly €500 million of invoices before the contractual deadline for very small, small and medium-sized suppliers in France. These measures taken in the first half-year have no impact on the Group's working capital at 31 December 2020.

Estimated impacts of the Covid-19 pandemic on the income statement for 2020

In accordance with AMF and ANC recommendations, the Group has not applied any different classifications as a result of Covid-19 from those normally used in its income statement. In-depth analyses were conducted in the Group's local entities and centrally for the half-year closing at 30 June 2020, then the annual closing at 31 December 2020, to prepare reliable estimates of the impacts of the pandemic on the Group's financial statements. The main estimated impacts of the Covid-19 pandemic on items of the Group's income statement are presented below.

The pandemic's impact on **sales** at 31 December 2020 is an estimated €(2,306) million (or around -3.3% of total sales). This impact mainly concerns the following business segments:

- France - Generation and Supply: the estimated impact of €(1,083) million, reflecting the lower nuclear power output and a decline in demand for electricity which led to sales on the wholesale markets at lower prices;
- France – Regulated activities: the estimated impact of €(278) million is mainly associated with the lower demand for electricity (leading to a decrease in sales of delivery services) and in the first half-year the downturn in network connection activity (work on connections and plant modification was suspended from 16 March until 11 May 2020);

1 See the press release of 16 April 2020: Crise sanitaire : EDF s'engage sur des mesures inédites pour aider tous ses clients (in French only).

2 See the press release of 2 April 2020: The EDF group united in its determination to tackle the public-health crisis.

- The United Kingdom: the estimated impact of €(451) million results from the lower demand for electricity, principally for customers in the industrial and business segments;
- Italy: the estimated impact of €(90) million reflects the downturn in demand for electricity and gas;
- Dalkia: the estimated impact of €(193) million principally relates to closures of client sites during the lockdown period (this had a significant effect on thermal and electric engineering work), and a lower level of business in services and to a smaller degree energy.

The impact of the Covid-19 pandemic on **fuel and energy purchases** at 31 December 2020, due to the decline it caused in nuclear power output and demand for electricity and gas, is an estimated decrease of approximately €854 million, principally in the France – Regulated activities and France – Generation and Supply segments and the United Kingdom.

The pandemic also had an estimated downward impact of €344 million **on external expenses (net of capitalised production costs)** reflecting several types of effect:

- lower purchases as a result of the business downturn in services and engineering work, principally at Dalkia;
- slowdowns or deferrals of on-site work in the Group's various businesses led to lower non-capitalisable purchases;
- additional expenses incurred in connection with the Covid-19 pandemic (protective equipment, hand sanitiser, etc);
- lower purchases as a result of the lockdown and various measures introduced by the public authorities, for example restrictions on movement and requiring people to work from home (less travel, training and seminars, etc).

Personnel expenses increased by some €64 million, principally in connection with the business recovery plan introduced by the Group. This amount includes indemnities received or receivable under furlough schemes in some Group entities in France (see note 1.4.1.5), amounting to approximately €18 million, together with the unfavourable effects of the pandemic in terms of employee holiday pay at certain Group entities in France.

Finally, **other operating income and expenses** were adversely affected to the extent of some €(309) million, including €(204) million following revaluation of impairment of trade receivables in various Group entities (see note 1.4.1.2) and €(45) million due to an increase in decommissioning provisions for permanently shut-down nuclear power plants in France where decommissioning work had to be postponed.

The above estimated impacts were prepared from specific reporting set up by the Management with all Group entities as part of the closing for the consolidated financial statements, applying the following approaches:

- effects associated with downturns in business levels (services, engineering work) or deferrals of work are based on detailed comparative analyses with the corresponding period of 2019, or infra-annual forecasts; impacts on sales due to lower demand for electricity and gas are based on analyses founded on consumption forecast models that take account of other effects (weather effects, portfolio changes, etc); impacts on nuclear power output are based on analyses of generation by plants in operation (particularly for modulation) and detailed analyses of outages for units that had a scheduled outage in 2020 after the pandemic crisis began, whether for fuel reloading or for regular maintenance, by comparison of activities and time spent on outages in the crisis context in 2020 with a model of outages and the actual work completed in 2019;
- the estimates calculated aim to assess the financial impacts of the Covid-19 pandemic regarding the downturn in business activity, and volumes sold and produced. These estimates do not include impacts of crisis-correlated price effects such as observed market prices over the period, due to the difficulty of attributing them directly and solely to the pandemic. Furthermore, these impacts do not include the effects of action plans implemented by the Group in response to the pandemic;
- additional expenses incurred in connection with the public health crisis (protective equipment, hand sanitiser, etc), or assessment of the specific measures or risks associated with the crisis, are based on figures recorded in the accounting information system.

The resulting estimated impact of the Covid-19 pandemic on Operating profit before depreciation and amortisation at 31 December 2020 is some €(1,479) million (at 30 June it was some €(1,010) million). This impact mainly concerns the following business segments: France - Generation and Supply (€(872) million against €(482) million in the first half-year), France - Regulated activities (€(237) million against €(212) million in the first half-year) and the United Kingdom (€(182) million against €(128) million in the first half-year). The pandemic's estimated impacts on the Group's other business segments are less material given the consolidated operating profit before depreciation and amortisation at that date, and mainly concern Dalkia (€(40) million against €(39) million in the first half-year), Framatome (€(47) million against €(37) million in the first half-year), and Italy (Edison) (€(60) million against €(47) million in the first half-year).

Some estimates reflecting the information known to the Group at 31 December 2020, notably concerning the risk of non-recovery of customer receivables, are uncertain by nature. The final situation would differ from the year-end estimates, depending on how the crisis ends, and more broadly the economic consequences in 2021.

Finally, it should be noted that the financial result has been significantly impacted by the decline on the financial markets, through changes in the fair value of financial instruments in the first half-year (see note 12 to the condensed consolidated half-year financial statements). The behaviour of the financial markets in the second half-year, combined with the Group's

allocation approach for portfolio management, led to clearly positive changes in the fair value of financial instruments at 31 December 2020 (see note 8).

The Group has also recognised impairment in 2020 that among other factors reflect indirect effects of the pandemic (see note 10.8).

1.4.1.1 Liquidity risk

As reported in the condensed consolidated half-year financial statements, at 30 June 2020 the Group had a strong liquidity position of €40.9 billion (cash, cash equivalents and available-for-sale liquid financial assets at gross value, including securities transferred under repurchase agreements which amounted to €6.5 billion in the first half of 2020 in the context of the Covid-19 pandemic), and unused credit lines with banks amounting to €10.9 billion (see notes 23.2.3 and 23.3 to the condensed consolidated half-year financial statements).

At 31 December 2020 the Group had a strong liquidity position of €32.4 billion at gross value (cash, cash equivalents and available-for-sale liquid financial assets, including unused credit lines with banks amounting to €11.1 billion (see notes 18.4 and 19.2).

1.4.1.2 Sales and Trade receivables

Impairment of trade receivables

The Group calculates impairment of trade receivables by reference to provision matrices based on credit loss histories (the IFRS 9 simplified approach).

Despite the support measures introduced by national governments, and the support measures put in place by the Group for its customers, the Covid-19 pandemic should result in an increase in the amount of non-recoverable receivables which was not yet very visible at 31 December 2020. The risk analyses conducted by different Group entities have led to a €223 million increase to impairment of trade receivables resulting from the pandemic, under other operating income and expenses in the income statement. This amount comprises €80 million concerning the France – Generation and Supply segment, €58 million for the France – Regulated activities segment, €68 million for the United Kingdom, and €13 million for Belgium. The credit risk on EDF Trading's portfolio was also increased by an amount of €22 million in Sales (Trading).

This increase in impairment results primarily from the fact that the provision matrices habitually used are applied to a broader base of receivables in the portfolio reflecting longer payment times as a result of the pandemic, particularly in the Business customer segment in France, and the United Kingdom. It is also explained by adjustments made to the provision matrices via post-model corrections to take account of the specific situation brought about by the Covid-19 pandemic which was not reflected in the existing models. To determine these corrections, differentiated approaches were introduced for each country and customer type (residential customers and business customers by industry sector).

In France, in the Residential customer segment, the increase in the credit risk remains moderate at this stage (as most of customers in the portfolio pay by direct debit and so far no increase in debit rejections has been observed; also, support measures for customers in difficulty have been introduced). Nevertheless, corrections were applied, by increasing the provision rate for all doubtful trade receivables arising since the start of the pandemic that are considered at greater risk of becoming non-recoverable than the receivables less than 12 months old used to construct the existing provision matrices, and by increasing the provision rate for current receivables, notably based on an INSEE (French statistical office) study of October 2020 of the economic consequences of lockdown on household finances, taking account of prospects of a rise in France's unemployment rate following the Covid-19 pandemic.

In the Business customer segment, at the top end of the portfolio (large customers), case-by-case monitoring referring to external credit ratings did not indicate any material increase in the credit risk. At the bottom end and middle of the portfolio (small and medium-sized businesses, very small businesses), provision matrices were corrected for the business sectors in this portfolio deemed to entail the highest risk, in order to reflect a probable increase in the default rate (based, among other things, on external macroeconomic forecasts, for example publications by credit insurance companies such as Coface or Euler Hermes). The data available at the year-end instead suggest that the level of default observed by businesses is in fact lower in 2020 than the previous year; this is attributed to a "delay effect". The forecast default rates used at the year-end therefore incorporate the likelihood of an increased risk in 2021 in the expected credit loss.

In the France – Regulated activities segment, the increase in impairment of trade receivables primarily reflects the risk on the delivery component of the invoice to the final customer.

In the United Kingdom, a similar approach was used, separating Residential and Business customers and referring to portfolio and business segments as appropriate to the country's situation. In particular, the probable increase in the default rate for businesses is considered to be higher than in France.

In Italy, in view of non-recourse assignments of receivables and credit insurance agreements, the increase in the credit risk is considered low.

Assignment of trade receivables

Some group entities make use of non-recourse assignment programmes for trade receivables. The assignees in the programme have not tried to renegotiate any contractual clauses that would affect the non-recourse nature of their contracts.

ARENH dispute – *Force majeure*

The Covid-19 pandemic and the emergency measures introduced by France's public authorities from 17 March 2020 led to a decline in electricity consumption by non-residential clients that affected all market players, including EDF.

Faced with this decline in electricity consumption, some suppliers wanted to reconsider their contractual commitments, citing force majeure to reduce the volumes they had purchased from EDF in November 2019 under the ARENH mechanism.

Confirming the French Energy Regulation Committee's (CRE's) decision of 26 March, on 17 April the French Council of State rejected an appeal filed by two energy supplier associations, considering that the losses incurred by the energy suppliers concerned were not "such that they would jeopardise (...) the survival of the businesses over a horizon of a few months" and that "these losses would have such an impact during the timeframe required by the competent judge to make a ruling on the claims".

On 20, 26 and 27 May 2020, after summary proceedings the Paris Commercial Court ruled that the introduction of emergency measures by the French government constituted a force majeure event for the ARENH contracts with Alpiq, Gazel and Total Direct Energie, entailing suspension of those contracts. On 28 July 2020, the Paris Court of Appeal upheld the urgent application judge's decision. EDF has appealed against this ruling. Total Direct Energie is the only remaining party in the ongoing proceedings

On 2 June 2020[1], EDF notified the energy suppliers Alpiq, Gazel and Total Direct Energie of the termination of their ARENH contracts, as allowed when these contracts are suspended for more than two months. This decision was made as a precautionary measure to protect EDF's rights.

A challenge to this termination was taken before the urgent applications judge, who issued a ruling concerning Total Direct Energie on 1 July 2020 that temporarily suspended the effects of EDF's contract termination letter. On 19 November 2020 the Paris Court of Appeal overturned that ruling and restored the effects of the termination notified by EDF on 2 June 2020.

In the meantime, three energy suppliers notified EDF of the end of the force majeure event in mid-June and ARENH deliveries resumed. As the CRE did not allow EDF's request to suspend ARENH deliveries to Total Direct Energie for the end of the year, in application of the Paris Court of Appeal decision of 19 November, on 10 December 2020 EDF brought a claim before the Council of State for abuse of power, requesting cancellation of the CRE's decision.

The suspension of deliveries to these three suppliers for approximately 15 days (from the ruling by the Paris commercial court in summary proceedings, to the notification of the end of force majeure by the suppliers), and the continuation of deliveries to Total Direct Energie, represents some tens of millions of euros in lost income for EDF at 31 December 2020 (due to the price effect of volumes being sold at market prices instead of ARENH prices during that period).

Further summary proceedings were initiated in late September 2020 by Ohm Energie, seeking a suspension of payments due for ARENH volumes, claiming that deliveries had been continued illegally by EDF since it had requested suspension of ARENH deliveries from April to June 2020 due to force majeure. On 23 October 2020 the Paris Commercial Court rejected all of Ohm Energie's claims.

In parallel to the above summary proceedings, cases concerning the substance of the matter were brought before the Paris Commercial Court by several ARENH applicants, claiming compensation from EDF for the prejudice caused by its allegedly illegal refusal to apply the force majeure clause. These cases are ongoing.

1.4.1.3 Property, plant and equipment

Gross investments in intangible assets and property, plant and equipment in 2020 amounted to €16,007 million (see note 4) compared to €16,797 in 2019, a decrease of €790 million. These amounts include capitalised production costs totalling €7,888 million in 2020 (charged to other external expenses, which are reported net of those items in the income statement) and €7,932 million in 2019.

The Covid-19 pandemic had a moderate overall impact at Group level on gross investments in intangible assets and property, plant and equipment compared to 2019, although the nature and scale of its effects varied in different Group entities.

With the introduction of national lockdowns and practices to prevent the virus spreading, which differed across countries and regions, some work projects were suspended and deferred, while others continued but at a much slower pace or over a longer period. Resumption of work has varied in speed and intensity in the second half of the year, depending on the activities concerned and the countries where the Group operates. Some work, much of it engineering work, could be done remotely.

1 *See the press release of 2 June 2020: EDF has notified three energy suppliers of the termination of their Arenh contracts.*

The new public health measures themselves have sometimes generated additional costs, principally resulting from additional protective activities, tension on external resources in some fields of work, and longer completion time for certain operations (due to adoption of practices to stop the virus spreading, limits on the number of workers on site, etc). Additional costs directly attributable to continuation of site work and completion of assets have been capitalised, in accordance with IAS 16. No significant effect resulting from low production activity ("*sous-activité*") that might have been capitalised was identified at 31 December 2020. The costs of demobilising and remobilising personnel for the deferred and suspended worksites are recorded as expenses.

For the France - Generation and Supply segment, gross investments decreased by €588 million between 2019 and 2020 (see note 4). Most of this decrease was unrelated to Covid-19 effects, which were as follows:

- some scheduled reactor outages at nuclear plants in operation were deferred, while the duration of outages was extended, entailing higher costs. On 29 October 2020, EDF announced an adjusted cost for the Grand Carénage programme to 2025. The new cost estimate mainly reflects the first findings on the work to be conducted for the fourth ten-year inspections of the Group's 900MW reactors, and the revised duration of scheduled maintenance outages based on experience from previous year and the impacts of the Covid-19 pandemic for the period 2020- 2022;
- work on hydropower projects was suspended, apart from required safety and security work (or completion of essential work), from 17 March 2020 and resumed from mid-April and the pace of work was practically back to normal by the end of May;
- the majority of nuclear engineering work could be done remotely;
- after a Covid-19 outbreak was identified in the Manche area, work on the Flamanville site was restricted from mid-March to safety, security and environment monitoring work only. On-site work for the Flamanville 3 project resumed progressively from 4 May 2020 and was back to near-normal levels in July 2020; based on work in the second half-year, the Covid-19 pandemic ultimately had a non-significant impact on 2020 investments in Flamanville 3 compared to 2019; knowing that the exceptional additional costs of repair work on the main secondary circuit welds in the Flamanville 3 EPR were recorded as other income and expenses (see note 7).

Enedis (France – Regulated activities segment) stopped work during France's lockdown on connections, grid modification, and the network generally, and suspended Linky meter installations. Resumption of work at a brisk pace since 11 May 2020 reduced the backlog, particularly for installation of Linky meters. As a result of these effects, gross investments by the France – Regulated activities segment (which also includes Electricité de Strasbourg and the island activities) were €423 million lower in 2020 than 2019, an amount similar to the decrease observed in the first half of 2020 and mainly attributable to the effects of the pandemic.

In the United Kingdom, work on the Hinkley Point C project slowed down in April 2020 due to the lower number of people working on site at a stage of significant development. Gross investments by EDF Energy increased by €133 million between 2019 and 2020.

EDF Renewables saw a slight rise of €42 million in gross investments compared to 2019, mainly driven by projects in North America.

The value of property, plant and equipment reported by the Group also includes interest expenses on financing of assets incurred during the construction period in the case of qualifying assets as defined by IAS 23 "Borrowing costs". When development of an asset is suspended for a long period, capitalisation of interest must also be suspended. This was the case for the Flamanville EPR project, where capitalisation of the associated interest was suspended between 16 March and 30 June 2020, resulting in a €120 million increase in financial expenses at 31 December 2020.

1.4.1.4 Provisions

Capacity mechanism - imbalance settlement payments

In view of the significant downward revision during the first half-year of estimates of nuclear power output in France for 2020, and the results of the capacity auction held on 25 June 2020, EDF considered in its half-year financial statements that it was likely to be required to make imbalance settlement payments for the delivery year 2020, and recorded a provision of €137 million for this purpose at 30 June 2020 (see note 5.1 for details of the operation of France's capacity mechanism). In view of the final output achieved in 2020, and particularly the availability of EDF generation plants during the peak periods of the second half of the year, this provision was cancelled in the second half-year since EDF had fulfilled its obligations relating to the French capacity mechanism.

Provisions for onerous contracts

The Group has updated its provisions for onerous contracts (mainly gas purchase contracts and some customer contracts), principally to reflect changes in market price scenarios (see notes 5.2 and 17.2). No new significant onerous contracts were identified.

Decommissioning provisions for permanently shut-down nuclear power plants

Ongoing work on the decommissioning was halted from 16 March 2020. On these sites, only the regulatory activities (monitoring the environment, site safety and security) continued. Work first resumed on 11 May 2020.

The temporary deferral of certain types of on-site decommissioning work led to a €45 million increase to provisions for decommissioning concerning nuclear plants currently being dismantled at 31 December 2020.

1.4.1.5 Government support measures

As a result of the Covid-19 pandemic, certain Group entities in France have had to suspend or slow down their activities, and made use of the furlough scheme set up by the government. At 31 December 2020 the indemnities received amount to €18 million and have been recognised as a deduction from personnel expenses.

During the pandemic some States extended deadlines for payment of taxes. EDF Energy, among other group entities, has made use of these measures and deferred its monthly VAT payments. The amount concerned was £117 million at 30 June 2020 and around £104 million at 31 December 2020.

1.4.1.6 Other assets, liabilities, income and expenses

In addition to the information in the previous paragraphs, the Covid-19 pandemic did not involve any other specific use of judgements, estimates or assumptions for determination of the value of assets and liabilities, income and expenses of the period (compared to those described in note 1.3).

1.4.2 IFRS 5 - Sale of Edison's E&P Operations

Edison Exploration and Production manages all activities, mining titles and shareholdings of Edison and the Group in the hydrocarbons business in Italy and internationally.

On 4 July 2019, Edison announced the signature of an agreement with Energean Oil and Gas for the sale of 100% of Edison E&P (Exploration and Production), which manages all the EDF group's hydrocarbons sector activities, mining titles and corporate shareholdings in Italy and abroad.

The EDF group consequently classified the sale of the E&P operations as a discontinued operation as defined by IFRS 5 in its financial statements at 31 December 2019 (see note 2 to the consolidated financial statements at 31 December 2019).

On 23 December 2019, Edison disclosed that the sale to Energean Oil and Gas was still awaiting government authorisations regarding its E&P assets in Algeria.

After the Algerian authorities refused to authorise the sale of those assets, on 2 April 2020 Edison's Board of Directors approved the signature of an amendment to the disposal agreement, excluding the Algerian E&P assets from the scope of the agreement of 4 July 2019.

Then following the announcement by Energean on 19 May 2020 that the proposed sale of Edison's E&P operations in Norway to Neptune Energy was to be terminated, a second amendment was signed on 28 June 2020, excluding the Norwegian subsidiary from the agreement. The acquisition process and its new scope was approved by Energean at an extraordinary general shareholders' meeting on 20 July 2020.

On 17 December 2020 Edison and Energean finalised the sale of Edison Exploration and Production S.p.A. in the hydrocarbons (oil and natural gas) exploration and production business. The sale price was based on an enterprise value of $284 million, with an additional consideration of a maximum $100 million upon commissioning of the Cassiopea gas project in Italy, depending on the PSV gas price at the time of the first delivery.

Edison also signed an agreement on 30 December 2020 for the sale of the Norwegian operations to Sval Energi. This operation requires the approval of the Norwegian authorities and should be completed during the first half of 2021 (see the Edison press release of 30 December 2020).

1.4.2.1 Presentation of E&P's operations at 31 December 2019, excluding Algeria and Norway

Due to this situation, in application of IFRS 5, at 31 December 2020 the amounts of Edison's Algerian E&P assets and liabilities are presented in the consolidated balance sheet as continuing operations, while the Norwegian A&P operations are presented in the consolidated balance as discontinued operations.

The net income and the net change in cash for the Algerian and Norwegian E&P operations are reported in the specific line "Net income of continuing operations" and allocated to the relevant lines of the income statement and cash flow statement for the periods published, i.e. 2020 and the comparative figures for 2019.

The net income of discontinued operations, and the net change in cash of discontinued operations, corresponding to Edison's E&P operations excluding the Algerian and Norwegian E&P operations, are still reported on a specific line in the income statement and cash flow statement for the periods published, until finalisation of the sale which took place on 17 December 2020. At 31 December 2020, the assets and liabilities of discontinued operations include the E&P operations in Norway and are presented in note 3.2.

In this new situation, the impacts on the Group's income statement and cash flow statement of application of IFRS 5 at 31 December 2019 are presented below.

Impacts on the 2019 income statement

(in millions of euros)	2019 as published	IFRS 5 adjustments	2019 restated
Sales	71,317	30	71,347
Fuel and energy purchases	(35,091)	-	(35,091)
Other external expenses	(8,619)	(6)	(8,625)
Personnel expenses	(13,793)	(4)	(13,797)
Taxes other than income taxes	(3,798)	-	(3,798)
Other operating income and expenses	6,692	(5)	6,687
Operating profit before depreciation and amortisation	**16,708**	**15**	**16,723**
Net changes in fair value on energy and commodity derivatives, excluding trading activities	642	-	642
Net depreciation and amortisation	(10,002)	(18)	(10,020)
(Impairment)/reversals	(403)	-	(403)
Other income and expenses	(185)	-	(185)
Operating profit	**6,760**	**(3)**	**6,757**
Cost of gross financial indebtedness	(1,806)	-	(1,806)
Discount effect	(3,161)	-	(3,161)
Other financial income and expenses	4,606	(3)	4,603
Financial result	**(361)**	**(3)**	**(364)**
Income before taxes of consolidated companies	**6,399**	**(6)**	**6,393**
Income taxes	(1,581)	49	(1,532)
Share in net income of associates and joint ventures	818	-	818
Net income of discontinued operations	(454)	(43)	(497)
CONSOLIDATED NET INCOME	5,182	-	5,182
EDF net income	***5,155***	***-***	***5,155***
Net income of continuing operations	5,597	42	5,639
Net income of discontinued operations	(442)	(42)	(484)
Net income attributable to non-controlling interests	***27***	***-***	***27***
Net income of continuing operations	39	1	40
Net income of discontinued operations	(12)	(1)	(13)

Impacts on the 2019 consolidated cash flow statement

(in millions of euros)	2019 as published	IFRS 5 adjustments	2019 restated
Operating activities:			
Consolidated net income	**5,182**	**-**	**5,182**
Net income of discontinued operations	**(454)**	**(43)**	**(497)**
Net income of continuing operations	**5 636**	**43**	**5,679**
Impairment/(reversals)	403	-	403
Accumulated depreciation and amortisation, provisions and changes in fair value	8,328	30	8,358
Financial income and expenses	97	4	101
Dividends received from associates and joint ventures	349	-	349
Capital gains/losses	(508)	-	(508)
Income taxes	1,581	(49)	1,532
Share in net income of associates and joint ventures	(818)	-	(818)
Change in working capital	452	23	475
Net cash flow from operations	***15,520***	***51***	***15,571***
Net financial expenses disbursed	(798)	(4)	(802)
Income taxes paid	(922)	7	(915)
Net cash flow from continuing operating activities	**13,800**	**54**	**13,854**
Net cash flow from operating activities relating to discontinued operations	**222**	**(54)**	**168**
Net cash flow from operating activities	**14,022**	**-**	**14,022**
Investing activities:			
Acquisitions of equity investments, net of cash acquired	(456)	-	(456)
Disposals of equity investments, net of cash transferred	293	-	293
Investments in intangible assets and property, plant and equipment	(16,709)	(88)	(16,797)
Net proceeds from sale of intangible assets and property, plant and equipment	94	-	94
Changes in financial assets	1,294	-	1,294
Net cash flow from continuing investing activities	**(15,484)**	**(88)**	**(15,572)**
Net cash flow from investing activities relating to discontinued operations	**(166)**	**88**	**(78)**
Net cash flow from investing activities	**(15,650)**	**-**	**(15,650)**
Financing activities:			
Cash flows with shareholders	***828***	**-**	***828***
Other cash flows from financing activities	***1,414***	**-**	***1,414***
Net cash flow from continuing financing activities	**2,242**	**-**	**2,242**
Net cash flow from financing activities relating to discontinued operations	**(19)**	**-**	**(19)**
Net cash flow from financing activities	**2,223**	**-**	**2,223**
Net increase/(decrease) in cash and cash equivalents from continuing operations	558	(34)	524
Net increase/(decrease) in cash and cash equivalents from discontinued operations	37	34	71
Net increase/(decrease) in cash and cash equivalents	**595**	**-**	**595**
CASH AND CASH EQUIVALENTS - OPENING BALANCE	**3,290**	**-**	**3,290**
Net increase/(decrease) in cash and cash equivalents	595	-	595
Effect of currency fluctuations	(5)	-	(5)
Financial income on cash and cash equivalents	17	-	17
Effect of reclassifications	37	-	37
CASH AND CASH EQUIVALENTS - CLOSING BALANCE	**3,934**	**-**	**3,934**

1.4.2.2 Impact of the sale of Edison's E&P operations on the consolidated financial statements at 31 December 2020

The impact at 31 December 2020 of the sale of the E&P operations (excluding the Algerian and Norwegian assets) is €(117) million on consolidated net income (the "Net income of discontinued operations" line), after impairment determined as the difference between the net consolidated value of the discontinued operation and the sale price including an estimation of the additional consideration (see note 10.8).

This sale reduced the EDF group's net indebtedness by €187 million.

NOTE 2 SUMMARY OF SIGNIFICANT EVENTS

Apart from the Covid-19 pandemic presented in note 1.4.1 and the sale of the E&P operations presented in note 1.4.2, the main significant events and transactions for the Group **in 2020** are the following:

- **Nuclear developments:**
  - EDF restarted Hunterston B power station and confirmed its plan to move into the decommissioning phase by January 2022. It also announced that Hinkley Point B power station in Somerset will enter into the defueling phase no later than 15 July 2022 (see the EDF Energy press release of 27 August 2020 and 19 November 2020, and note 10.8);
  - The Group readjusted the cost of the *Grand Carénage* programme to increase safety and extend the operating life of nuclear reactors beyond 40 years (see the press release of 29 October 2020 and note 10.6);
  - Hinkley Point C project update (see the press release of 27 January 2021 and notes 10.6 and 10.8).
- **Financing operations:**
  - EDF made a landmark offering of green bonds convertible into new shares and/or exchangeable for existing shares (*OCEANEs vertes*) (see the press releases of 8 September 2020 and note 18.3.2.2 and 14.5);
  - EDF raised €2.1 billion through two issues of hybrid notes (see the press release of 8 September 2020 and note 14.4.2);
  - EDF and Standard Chartered Bank signed a €200 million credit facility indexed on ESG criteria (see the press release of 30 October 2020 and note 18.4).
- **Renewable energies:**
  - EDF Renewables, Enbridge and wpd began construction of the Fécamp offshore wind farm (see the press release of 2 June 2020 and note 12.3);
  - The EDF and CEI groups became partners for the construction and operation of offshore wind power projects in China (see the press release of 2 June 2020 and note 12.3);
  - EDEN Renewables India increased its portfolio with 1,350MWp of new solar photovoltaic power plants (see the EDF Renewables press release of 1 October 2020 and note 12.3);
  - EDF Renewables - Jinko Power consortium reached the financial closing of the world's largest solar project and launched its construction in Abu Dhabi (see the press release of 22 December 2020 and note 12.3);
  - EDF commissioned the new Romanche-Gavet hydroelectric plant, France's biggest hydropower project (97MW) (see the press release of 9 October 2020).
- Fifth anniversary of the Paris Agreement: EDF stepped up its ambitions and made new climate commitments (see the press release of 10 December 2020 and note 20).

The main significant events and transactions for the Group **in 2019** were the following:

- **Nuclear developments**:
  - Flamanville 3 EPR: following the quality deviations affecting the welds located on the main steam transfer pipes covered by the break preclusion principle, the ASN's decision regarding repairs to the penetration welds led to revision of the project costs and timetable (see the press release of 11 April 2019, 20 June 2019, 26 July 2019, 9 October 2019 and note 10.6) ;
  - Hinkley Point C: a review of the HPC project's costs, schedule and organisation was undertaken (see the press release of 25 September 2019 and note 10.6).
- **Renewable energies:**
  - The EDF Group began construction of the Scottish 450MW offshore wind farm Neart na Gaoithe (NnG) with its new Irish partner ESB, which took a 50% stake in the project (see the press release of 28 November 2019 and notes 3.1 and 5.4.2).

France multi-year energy programme (PPE)

The PPE covering the periods 2019-2028 was adopted by decree 2020-456 of 21 April 2020, published in the *Journal officiel* of 23 April 2020. The points on which the final programme differs from the drafts published on 25 January 2019 and 20 January 2020 essentially relate to renewable energies. The PPE sets a target of doubling the 2017 level of installed capacity for electricity from renewable energies by 2028, and increasing offshore wind power capacities, with 6 project tenders to be launched in the first PPE period. EDF's strategy is entirely consistent with this aim.

To reduce nuclear power output, as well as the closure of the two Fessenheim reactors in the spring of 2020, 12 nuclear reactors will have to be shut down by 2035 (see note 5.4.3). The reactors concerned will be shut down when their fifth 10-year inspection is due, except for 2 reactors which will be shut down earlier in 2027 and 2028 (two additional reactors could also be shut down in 2025-2026 if certain conditions relating to electricity prices and secure supply are fulfilled). Priority

will be given to shutdowns that minimise the economic and social impact, have the lowest impact on the electricity network, and do not entail closure of an entire site. At the request of the French government, based on these criteria, on 20 January 2020 EDF proposed to examine the possibility of shutting down pairs of reactors at the sites of Blayais, Bugey, Chinon, Cruas, Dampierre, Gravelines and Tricastin. The PPE stipulates that early reactor shutdowns will be confirmed 3 years prior to implementation.

Adoption of the PPE in April 2020 led to re-estimation of nuclear provisions at 30 June 2020, referring to various scenarios for the early shutdowns of two reactors in 2027 and 2028. This resulted in a €32 million increase in provision related to nuclear generation on 31 December 2020 (mainly decommissioning provisions, see note 15.1.1.3). Accelerated depreciation periods were also estimated based on these scenarios, leading to an increase in depreciation in the second half of the year, with no significant impact on the consolidated financial statements (see note 1.3.4.1).

The reactor shutdowns at the Fessenheim plant took place on 22 February 2020 for reactor 1 and 30 June 2020 for reactor 2, in accordance with decree 2020-129 of 18 February 2020 terminating the plant's operating licence (see note 5.4.3).

Public consultation on regulation of existing nuclear facilities

As announced in the draft PPE published on 25 January 2019, in January 2020 the French government launched a call for contributions regarding the fundamental findings driving the plan to reform the economic regulations for existing nuclear facilities, and their construction and operating principles. The proposed regulations would replace the ARENH mechanism and require EDF to provide a service of general economic interest (SGEI) for protection of the consumer and the climate to the benefit of all French consumers, ensuring transparency and non-discrimination.

This SGEI would be supported by economic regulation of the existing nuclear fleet, to reconcile and contribute to the following aims:

- long-term protection of all consumers located on French territory, regardless of their supplier and with respect to some of their non-peak power supplies, by enabling them to benefit from stable conditions for carbon-free, manageable production of electricity by the existing nuclear fleet they helped to finance;
- achievement of the climate targets France has set itself, and also of its objectives for a secure power supply and energy independence, by safeguarding the carbon-free electricity supply in France and more broadly in Europe, through secure long-term financing for operation of the existing nuclear installations that are necessary for that supply.

Like many other actors in the sector, the EDF group participated in this consultation, which ended on 17 March 2020.

In this context, France's Minister for the Ecological and Inclusive Transition and Minister of the Economy and Finance commissioned the CRE to carry out an assessment of the costs borne by the nuclear operator, and to determine fair remuneration for its nuclear activities under the government's potential future regulations. At a hearing before the French National Assembly's economic affairs committee on 7 July 2020, the CRE Chairman Jean-François Carenco stated that the CRE had sent its report on the cost of nuclear power in France to the government. The CRE also presented the conclusions of that report to the European Commission's Directorate-General for Competition on 16 July 2020.

The terms and conditions of new regulations governing existing nuclear facilities are currently being examined by the French government and the European Commission.

NOTE 3 SCOPE OF CONSOLIDATION

Accounting principles and methods

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.

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 (see note 12).

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.

The Group's principal joint operations are the LNG optimisation activities of Jera Global Markets, co-owned by EDF Trading, and the gas storage operator activity carried out by Friedeburger Speicherbetriebsgesellschaft mbH (FSG).

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.

3.1 CHANGES IN THE SCOPE OF CONSOLIDATION

3.1.1 Changes in the scope of consolidation in 2020

The following changes took place in the Group's scope of consolidation during 2020:

- disposal of Edison Exploration and Production S.p.A. (E&P) on 17 December 2020 (see notes 1.4.2 et 3.2);
- consolidation of EDF Pulse Croissance, Agregio, Energy2Market (E2M) and IZIVIA (see note 3.3).

3.1.2 Changes in the scope of consolidation in 2019

The following changes took place in the Group's scope of consolidation during 2019:

- disposal of EDF's 25% stake in Alpiq in May 2019 (see note 12);
- sale of 50% of the NnG project to the Irish electricity company ESB on 4 December 2019 (see note 5.4.2).

The principal acquisitions in renewable energies in 2019 were the following:

- EDF Renewables completed its acquisition of LUXEL Group, a French utility that develops and operates solar projects;
- in the United Kingdom, the acquisition of Pivot Power accelerated development in battery storage and electric vehicle (EV) charging infrastructures.

Disposal of EDF's 25% stake in Alpiq

On 4 April 2019 EDF, EBM (Coopérative Elektra Birseck) and EOS (EOS Holding SA) signed an agreement on EDF's disposal of its stake in Swiss power producer Alpiq (25.04% of the company's capital and voting rights) to EBM and EOS (each entity acquiring half of this stake).

This operation valued EDF's stake in Alpiq at approximately CHF489 million (around €434 million), based on a purchase price of CHF70 per Alpiq share. It reduced the Group's net indebtedness by €434 million. The Shares Purchase Agreement included potential earn-out mechanisms. The sale was completed on 28 May 2019 after it received clearance from the German competition authority.

The impact on the consolidated net income was not significant.

Sale of 50% of the Scottish offshore wind farm Neart na Gaoithe (NnG) to ESB

On 28 November 2019 the EDF Group announced the construction of the Scottish Neart na Gaoithe[1] (NnG) offshore wind farm project and a new partnership with the Irish electricity company ESB, which is taking a 50% stake in the project, acquired in May 2018 from Mainstream Renewable Power.

The 450MW NnG project is part of EDF's offshore wind power development strategy and confirms its position in carbon-free energy production in the United Kingdom, a country where EDF already has a strong footprint in both nuclear and renewable power.

This sale operation was completed on 4 December 2019 and accounted for a large share of EDF Renewables' gains on sales of generation assets in 2019 (a total €560 million, recorded in other operating income and expenses). It also contributed a €1.2 billion reduction in the EDF group's net indebtedness, due to the debt-reducing effect of loss of control over NnG.

Following this sale, the 50% holding in NnG, stated at fair value, is accounted for by the equity method.

Acquisition in renewable energies - acquisition of the LUXEL Group

On 28 March 2019, EDF Renewables acquired the Luxel Group, an independent photovoltaic energy operator in France which holds a portfolio of 1 GWc, mainly comprising projects ready to be constructed or currently being developed, and a few power plants already in operation. This acquisition reinforced EDF Renewables' position in solar power in France, with a view to achieving the objectives in EDF's Solar Plan.

Acquisition of Pivot Power

On 4 November 2019 the EDF group announced the acquisition of a British start-up called Pivot Power, specialising in battery storage and electric vehicle charging infrastructures. This move, is part of EDF's electricity storage plan and will enable EDF, already the largest low-carbon electricity producer in the UK, to become a leader in battery storage there.

Pivot Power has an extensive portfolio of battery storage projects across more than 40 locations throughout the UK, with a total capacity of close to 2GW. There are plans to install batteries connected directly to the high-voltage transmission system. The first two storage projects located at Kemsley (Kent) and Cowley (Oxford), are under construction at 31 December 2020 and should be commissioned during 2021.

3.2 DISCONTINUED OPERATIONS

Accounting principles and methods

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

1 *Gaelic for 'strength of the wind'*

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.

In accordance with IFRS 5:

- for assets or groups of assets that are identified and classified as held for sale during the year, there is no change of presentation or retrospective restatement in prior year balance sheets;
- assets or groups of assets that qualify as discontinued operations are restated in the income statement and the cash flow statement for the prior periods presented in the financial statements.

3.2.1 Assets held for sale and related liabilities

(in millions of euros)	31/12/2020	31/12/2019
ASSETS HELD FOR SALE	**2,296**	**3,662**
LIABILITIES RELATED TO ASSETS HELD FOR SALE	**108**	**1,043**

In application of IFRS 5, assets held for sale and related liabilities are shown below:

(in millions of euros)	31/12/2020	31/12/2019
Non-current non-financial assets[(1)]	316	893
Non-current financial assets	1,811	1,925
Current non-financial assets[(2)]	151	784
Current financial assets	18	60
TOTAL ASSETS HELD FOR SALE	**2,296**	**3,662**

(in millions of euros)	31/12/2020	31/12/2019
Non-current non-financial liabilities[(3)]	86	711
Non-current financial liabilities	1	34
Current non-financial liabilities	21	298
Current financial liabilities	-	-
TOTAL LIABILITIES RELATED TO ASSETS HELD FOR SALE	**108**	**1,043**

(1) Non-current non-financial assets comprise tangible assets and property, plant and equipment.
(2) Current non-financial assets comprise components of working capital and deferred taxes.
(3) Non-financial assets comprise provisions.

At 31 December 2020, assets held for sale and related liabilities concern the following:

- **The sale in progress of Edison's Norwegian E&P operations** (see note 1.4.2)
- **The sale in progress of Infrastrutture Distribuzione Gas (IDG),** a fully-owned subsidiary of Edison;

The IDG assets held for sale and related liabilities amount to €98 million and €7 million respectively at 31 December 2020.

In September 2020, Edison began discussions with 2i Rete Gas for the sale of its subsidiary IDG, which manages the gas networks and distribution plants for 58 towns in the Abruzzo region. These discussions led to signature of an agreement in January 2021. Finalisation of the sale, which is subject to approval under antitrust regulations, is expected to rake place in the first half of 2021 (see the Edison press release of 14 January 2021).

- **The sale in progress of the investment in CENG.**

The shares held in CENG are included in assets held for sale at the value of €1,811 million at 31 December 2020 (€1,925 million at 31 December 2019).

CENG owns five nuclear reactors across three nuclear power plants located in the states of New York and Maryland, with total capacity of 4,041MW (company-owned capacity). EDF has held a 49.99% share since 2014, alongside Exelon which controls CENG.

Pursuant to the agreements concluded with Exelon in 2014[1], EDF notified Exelon on 20 November 2019 that it had decided to exercise its put option on 49.99% of the shares of CENG.

1 EDF Press Release of 1 April 2014 "EDF and Exelon finalize agreement on CENG".

This put option was exercisable by EDF from 1 January 2016 to 30 June 2022. The sale price for the CENG shares will be based on their fair value, determined under the contractual provisions of the put option agreement.

This sale of the CENG shares is part of the disposal plan concerning non-core assets announced by Group.

Although completion of this operation is conditional on obtaining the required regulatory approvals and will take several months, in view of the terms of the contractual agreements, the Group is engaged in an irrevocable process. Authorisation was received from the FERC (Federal Energy Regulatory Commission) on 30 July 2020.

The sale process is still ongoing at 31 December 2020. Valuations were exchanged in the second half of 2020 but no final price has yet been agreed by the parties. At this stage, the Group's valuation for the put option does not indicate any significant risk of additional impairment.

The decrease in assets held for sale and related liabilities is explained by:

- the sale of Edison's E&P operations (excluding the Algerian and Norwegian operations) in December 2020 (see note 1.4.2) which represented assets of €1,129 million and liabilities of €910 million at 31 December 2020;
- reclassification of the Algerian E&P assets and liabilities as continuing operations, which represented assets of €84 million and liabilities of €5 million at 30 June 2020.

3.2.2 Net income of discontinued operations

The line "Net income of discontinued operations" comprises Edison's E&P operations (excluding the Algerian and Norwegian operations), and impairment recognised in respect of these assets.

The principal profit and loss indicators for the E&P operations (excluding the Algerian and Norwegian operations) in 2019 and 2020 are as follows:

(in millions of euros)	2020	2019[1]
Sales	216	377
Operating profit before depreciation and amortisation	86	237
Operating profit	13	125
Financial result	(22)	(22)
Income taxes	(32)	(87)
NET INCOME	**(41)**	**16**
Impairment of discontinued operations, net of income taxes	(117)	(513)
NET INCOME OF DISCONTINUED OPERATIONS[2]	**(158)**	**(497)**

[1] The published figures for 2019 have been restated due to the impact of the change in the scope of E&P operations (see note 1.4.2).
[2] The total amount of impairment recorded in 2019 on E&P operations remains allocated to discontinued activities, as it is not possible from the terms of the initial agreement to determine impairment in 2019 asset by asset.

3.3 SCOPE OF CONSOLIDATION AT 31 DECEMBER 2020

The Group's business sectors are defined as follows:

- **"Generation/Supply"** (G): generation of nuclear energy, thermal energy, and renewable energies (wind, photovoltaic and hydro) and energy sales to industry, local authorities, small businesses and private customers. This segment also includes 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;
- **"Services and other activities"** (O): energy services (district heating, thermal energy services, etc.) for industry and local authorities. This activity also includes EDF Invest's holding companies and entities that are classified as dedicated assets.

The companies and subgroups included in the EDF Group consolidation are listed below.

3.3.1 Fully consolidated companies

France – Generation and Supply		Percentage ownership at 31/12/2020	Percentage ownership at 31/12/2019	Business sector
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
Cyclife		100.00	100.00	O
CHAM SAS		100.00	100.00	O
Sowee		100.00	100.00	O
IZI Solutions		100.00	100.00	O
IZIVIA		100.00	-	O
EDF Pulse Croissance		100.00	-	O
Agregio		100.00	-	O
Energy2Market (E2M)		100.00	-	O
EDF ENR (formerly ENRS)		100.00	100.00	O
Immo C47		51.00	51.00	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
Luminus SA	Belgium	68.63	68.63	G, O
EDF Norte Fluminense 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
EDF Alpes Investissements SARL	Switzerland	100.00	100.00	O
Mekong Energy Company Ltd. (MECO)	Vietnam	56.25	56.25	G
EDF Andes Spa	Chile	100.00	100.00	G

Business sectors: G = Generation, D = Distribution, T = Transmission, R = Reactors, O = Other.

		Percentage ownership at 31/12/2020	Percentage ownership at 31/12/2019	Business sector
EDF Renewables				
EDF Renewables	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
EDF IMMO and real estate subsidiaries	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	G
Wagram Insurance Company DAC	Ireland	100.00	100.00	O
EDF Investissements Groupe SA	Belgium	92.46	93.89	O
Océane Re	Luxembourg	99.98	99.98	O
EDF Gas Deutschland GmbH	Germany	100.00	100.00	O

Business sectors: G = Generation, D = Distribution, T = Transmission, R = Reactors, O = Other.

3.3.2 Joint operations

Other activities		Percentage ownership at 31/12/2020	Percentage ownership at 31/12/2019	Business sector
Friedeburger Speicherbetriebsgesellschaft GmbH (Crystal)	Germany	50.00	50.00	O

Business sectors: G = Generation, D = Distribution, T = Transmission, R = Reactors, O = Other.

3.3.3 Companies accounted for by the equity method

France – Generation and Supply		Percentage ownership at 31/12/2020	Percentage ownership at 31/12/2019	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
AREPE Fund SCS (EDF Invest)	Luxembourg	21.99	24.66	O
Géosel Manosque (EDF Invest)	France	38.35	38.35	O
Transport Stockage Hydrocarbures (EDF Invest)	France	50.00	50.00	O
Central Sicaf (EDF Invest)	Italy	24.50	24.50	O
Thyssengas (EDF Invest)	Germany	50.00	50.00	O
Aéroports Côte d'Azur (EDF Invest)	France	19.40	19.40	O
Ecowest (EDF Invest)	France	50.00	50.00	O
Fallago Rig (EDF Invest)	United Kingdom	20.00	20.00	G
Fenland Wind Farm (EDF Invest)	United Kingdom	20.00	20.00	G
Catalinar Solar (EDF Invest)	USA	50.00	50.00	G
Switch (EDF Invest)	USA	50.00	50.00	G
MiRose (EDF Invest)	USA	50.00	50.00	G
Red Pine (EDF Invest)	USA	50.00	50.00	G
Energy Assets Groupe (EDF Invest)	United-Kingdom	40.00	-	O
Valentine Solar (EDF Invest)	USA	50.00	-	G
Glacier's Edge (EDF Invest)	USA	50.00	-	G
Nicolas Riou (EDF Invest)	Canada	50.00	-	G
Arada (EDF Invest)	Portugal	30.00	-	G
Cabreira (EDF Invest)	Portugal	30.00	-	G
Montemuro (EDF Invest)	Portugal	30.00	-	G
Korian & Partenaires Immobilier 1 & 2 (EDF Invest)	France	24.50	-	O
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)	Laos	40.00	40.00	G
Generadora Metropolitan (GM)	Chile	50.00	50.00	G
Nachtigal Hydro Power Company	Cameroon	40.00	40.00	G

Business segments: G = Generation, D = Distribution, T = Transmission, R = Reactors, O = Other.
[1] Coentreprise de Transport d'Electricité or CTE, the company holding 100% of RTE.

3.3.4 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 ownership at 31/12/2020	Percentage of voting rights held at 31/12/2020
Edison SpA	97.45	99.48
EDF Investissements Groupe SA	92.46	50.00

NOTE 4 SEGMENT REPORTING

4.1 REPORTING BY OPERATING SEGMENT

Accounting principles and methods

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).

The Group's segments are:

- "**France – Generation and Supply**": EDF SA's energy production and sales activities. This segment also includes entities operating on the downstream sectors (B2B and B2C, aggregation) and all EDF Invest's shareholdings;
- "**France – Regulated activities**": Enedis and Electricité de Strasbourg's distribution activities, and EDF's island activities;
- "**Framatome**": the entities of the Framatome subgroup;
- "**United Kingdom**": the entities of the EDF Energy subgroup;
- "**Italy**": Edison entities and TdE SpA;
- "**Other international**": EDF International and the entities located in continental Europe, the US, Latin America and Asia;
- "**EDF Renewables**": the entities of the EDF Renewables subgroup;
- "**Dalkia**": the entities of the Dalkia subgroup;
- **"Other activities"**: comprising in particular EDF Trading and EDF Investissements Groupe.

No segments have been merged.

4.1.1 At 31 December 2020

(in millions of euros)	France – Generation and Supply	France – Regulated activities	Framatome	United Kingdom	Italy	Other international	EDF Renewables	Dalkia	Other activities[5]	Inter-segment eliminations	Total
Income statement:											
External sales	27,112	16,178	1,900	9,041	5,937	2,242	1,069	3,729	1,823	-	**69,031**
Inter-segment sales	1,249	50	1,395	-	30	178	513	483	304	(4,202)	**-**
TOTAL SALES	**28,361**	**16,228**	**3,295**	**9,041**	**5,967**	**2,420**	**1,582**	**4,212**	**2,127**	**(4,202)**	**69,031**
OPERATING PROFIT BEFORE DEPRECIATION AND AMORTISATION	**7,412**	**5,206**	**534**	**823**	**683**	**380**	**848**	**290**	**261**	**(263)**	**16,174**
OPERATING PROFIT	**2,270**	**1,893**	**269**	**(947)**	**134**	**98**	**354**	**(32)**	**99**	**(263)**	**3,875**
Balance sheet:											
Goodwill	109	223	1,332	7,569	98	37	183	572	142	-	**10,265**
Intangible assets and property, plant and equipment	60,773	65,383	2,603	20,537	5,286	2,127	9,782	2,255	647	-	**169,393**
Investments in associates and joint ventures[1]	2,859	-	65	119	156	1,991	1,197	75	332	-	**6,794**
Financial assets and cash[2]	52,134	339	263	14,833	400	654	1,727	170	6,897	-	**77,417**
Other segment assets[3]	19,901	5,608	1,763	4,772	1,661	662	866	1,919	2,574	-	**39,726**
Assets classified as held for sale	-	-	-	-	485	1,811	-	-	-	-	**2,296**
TOTAL ASSETS	**135,776**	**71,553**	**6,026**	**47,830**	**8,086**	**7,282**	**13,755**	**4,991**	**10,592**	**-**	**305,891**
Other information:											
Net depreciation and amortisation[4]	(4,613)	(3,314)	(276)	(1,122)	(417)	(284)	(458)	(278)	(76)	-	**(10,838)**
Impairment	(16)	-	-	(638)	(74)	-	(36)	(34)	(1)	-	**(799)**
Equity (non-controlling interests)	118	38	115	7,090	178	423	828	284	519	-	**9,593**
Investments in intangible assets and property, plant and equipment	5,503	4,187	215	3,485	492	191	1,650	257	27	-	**16,007**
Loans and other financial liabilities	67,534	2,335	288	5,311	1,737	11,564	6,537	1,695	264	(31,674)	**65,591**
- external liabilities	*60,181*	*761*	*198*	*225*	*823*	*96*	*2,792*	*312*	*203*	-	***65,591***
- intersegment liabilities[6]	*7,353*	*1,574*	*90*	*5,087*	*913*	*11,468*	*3,747*	*1,380*	*62*	*(31,674)*	**-**

[1] At 31 December 2020, investments in associates and joint ventures include 50.1% of CTE (the joint venture holding RTE's shares) which is part of the France – Generation and Supply segment.

[2] Financial assets and cash mainly comprise dedicated assets amounting to €28,398 million in the France – Generation and Supply segment (see note 18.1.2) and the NLF receivable (see note 18.1.3) amounting to €13,034 million in the United Kingdom segment.

[3] Other segment assets include inventories, trade receivables, other receivables and tax assets. By convention, the CSPE receivable is totally allocated to the France-Regulated Activities segment, in the amount of €1,993 million (see note 13.3.4).

[4] Including net increases in provisions for renewal of property, plant and equipment operated under concessions.

[5] Sales by the "Other activities" segment include the €912 million trading margin realised by EDF Trading.

[6] The amount of intersegment liabilities corresponds to the group's centralised cash management (cash pooling by EDF SA, included in the France – Generation and Supply segment) and financing of controlled subsidiaries, particularly EDF International (Other international segment) and EDF Energy (United Kingdom segment).

4.1.2 At 31 December 2019

(in millions of euros)	France – Generation and Supply	France – Regulated activities	Framatome	United Kingdom	Italy[5]	Other international	EDF Renewables	Dalkia	Other activities[6]	Inter-segment eliminations	Total
Income statement:											
External sales	26,658	16,072	1,895	9,570	7,565	2,507	1,043	3,732	2,305	-	**71,347**
Inter-segment sales	1,212	15	1,482	4	32	183	522	549	423	(4,422)	**-**
TOTAL SALES	**27,870**	**16,087**	**3,377**	**9,574**	**7,597**	**2,690**	**1,565**	**4,281**	**2,728**	**(4,422)**	**71,347**
OPERATING PROFIT BEFORE DEPRECIATION AND AMORTISATION	**7,615**	**5,101**	**527**	**772**	**593**	**339**	**1,193**	**349**	**505**	**(271)**	**16,723**
OPERATING PROFIT	**3,483**	**1,892**	**230**	**(349)**	**69**	**42**	**670**	**(18)**	**1,009**	**(271)**	**6,757**
Balance sheet:											
Goodwill	72	223	1,341	7,965	103	33	199	544	143	-	**10,623**
Intangible assets and property, plant and equipment	58,275	63,499	2,591	19,034	5,410	2,226	9,773	2,288	626	-	**163,722**
Investments in associates and joint ventures[1]	2,593	-	90	127	104	2,058	1,063	75	304	-	**6,414**
Financial assets and cash[2]	51,246	407	276	14,693	485	533	1,351	260	10,303	-	**79,554**
Other segment assets[3]	18,526	5,233	2,132	5,352	1,678	790	861	2,001	2,736	-	**39,309**
Assets classified as held for sale	-	-	-	-	1,737	1,925	-	-	-	-	**3,662**
TOTAL ASSETS	**130,712**	**69,362**	**6,430**	**47,171**	**9,517**	**7,565**	**13,247**	**5,168**	**14,112**	**-**	**303,284**
Other information:											
Net depreciation and amortisation[4]	(4,047)	(3,200)	(263)	(1,009)	(427)	(269)	(474)	(259)	(72)	-	**(10,020)**
Impairment	(29)	-	(10)	(127)	(60)	-	(49)	(105)	(23)	-	**(403)**
Equity (non-controlling interests)	117	42	163	6,622	262	398	922	279	519	-	**9,324**
Investments in intangible assets and property, plant and equipment	6,091	4,610	210	3,352	376	227	1,608	275	48	-	**16,797**
Loans and other financial liabilities	68,192	2,002	342	5,323	1,723	8,315	5,746	1,691	210	(26,164)	**67,380**
- external liabilities	*62,121*	*783*	*233*	*224*	*762*	*93*	*2,695*	*340*	*129*	-	***67,380***
- intersegment liabilities[7]	*6,071*	*1,219*	*109*	*5,098*	*961*	*8,221*	*3,052*	*1,351*	*81*	*(26,164)*	**-**

[1] At 31 December 2019, investments in associates and joint ventures include 50.1% of CTE (the joint venture holding RTE's shares) which is part of the France – Generation and Supply segment.

[2] Financial assets and cash mainly comprise dedicated assets amounting to €26,018 million in the France – Generation and Supply segment (see note 18.1.2) and the NLF receivable (see note 18.1.3) amounting to €13,303 million in the United Kingdom segment.

[3] Other segment assets include inventories, trade receivables, other receivables and tax assets. By convention, the CSPE receivable is totally allocated to the France-Regulated Activities segment, in the amount of €1,667 million (see note 13.3.4).

[4] Including net increases in provisions for renewal of property, plant and equipment operated under concessions.

[5] The published figures for 2019 have been restated due to the impact of the change in the scope of E&P operations (see note 1.4.2).

[6] Sales by the "Other activities" segment include the €1,026 million trading margin realised by EDF Trading.

[7] The amount of intersegment liabilities corresponds to the group's central cash management (cash pooling by EDF SA, included in the France – Generation and Supply segment) and financing of controlled subsidiaries, particularly EDF International (Other international segment) and EDF Energy (United Kingdom segment).

4.2 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 EDF Trading;
- **"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 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
2020 :				
External sales:				
- France[2]	27,261	15,731	298	43,290
- International and Other activities	18,601	-	7,140	25,741
SALES	**45,862**	**15 731**	**7,438**	**69,031**

(in millions of euros)	Generation - Supply	Distribution	Other[1]	Total
2019 :				
External sales:				
- France[2]	26,834	15,607	289	42,730
- International and Other activities[3]	21,884	-	6,733	28,617
SALES	**48,718**	**15,607**	**7,022**	**71,347**

[1]"Other" groups of services include Framatome, which was acquired on 31 December 2017.
[2]France comprises the two operating segments France – Generation and Supply and France – Regulated activities (see note 4.1).
[3]Restated for the impacts of IFRS 5 due to the change in scope of E&P operations.

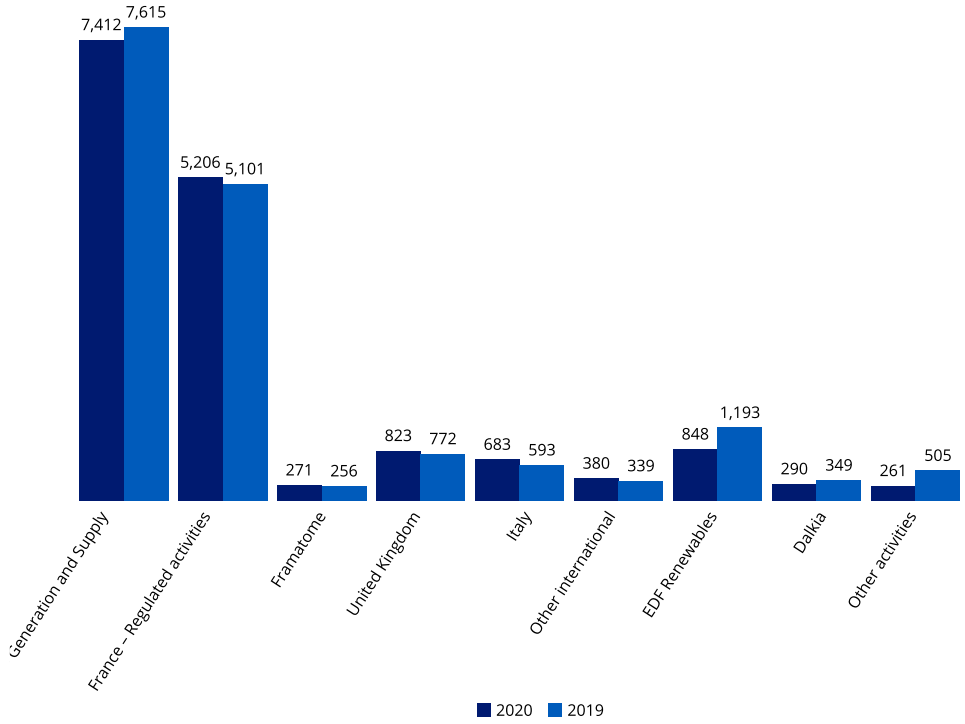
NOTE 5 OPERATING PROFIT BEFORE DEPRECIATION AND AMORTISATION

(in millions of euros)	Notes	2020	2019[1]
Sales	5.1	**69,031**	**71,347**
Fuel and energy purchases	5.2	**(32,425)**	**(35,091)**
External services		(13,072)	(13,142)
Other purchases (excluding external services, fuel and energy)		(3,524)	(3,598)
Change in inventories and capitalised production		7,888	7,932
(Increase)/decrease in provisions on other external expenses		247	183
Other external expenses[2]		**(8,461)**	**(8,625)**
Personnel expenses	5.3	**(13,957)**	**(13,797)**
Payroll taxes		(292)	(250)
Energy taxes		(1,635)	(1,674)
Other non-income taxes[3]		(1,870)	(1,874)
Taxes other than income taxes		**(3,797)**	**(3,798)**
Other operating income and expenses	5.4	**5,783**	**6,687**
Operating profit before depreciation and amortisation		**16,174**	**16,723**

[1]The published figures for 2019 have been restated due to the impact of the change in the scope of E&P operations (see note 1.4.2).
[2]After elimination of the effect of changes in foreign exchange rates and the scope of consolidation, other external expenses decreased by 2.8% compared to 2019
[3]Taxes other than income taxes mainly concern France and essentially comprise land tax and the French business taxes on land and value added. After elimination of changes in foreign exchange rates and scope of consolidation, other non income taxes increased by 1.3% compared to 2019.

The Group's consolidated operating profit before depreciation and amortisation for 2020 amounts to €16,174 million, a decrease of 3.3% from 2019.

The breakdown of the Group's Operating profit before depreciation and amortisation by operating segment in 2020 and 2019 is as follows, in millions of euros (see note 4.1):



After elimination of foreign exchange effects and changes in the scope of consolidation, the Group's operating profit before depreciation and amortisation showed an organic decline of -2.7% or €(450) million. This decrease is principally attributable to the France - Generation and Supply segment (-2.7% or €(203) million), EDF Renewables (-23.0% or €(274) million), Other activities (-44.8% or €(226) million) and France – Regulated activities (+2.1% or +€105 million).

The €(450) million decrease in operating profit before depreciation and amortisation in the France - Generation and Supply segment is essentially explained by the effects of the Covid-19 pandemic, estimated at €(0.9) billion, particularly due to lower nuclear power output combined with a decline in consumption. The other effects relating to lower plant availability, including the closure of Fessenheim, were offset by positive energy price effects (including tariff increases – see note 5.1.1) and higher capacity market revenue (see note 5.1).

Operating profit before depreciation and amortisation for the France – Regulated activities segment increased by €105 million despite the €(0.2) billion effects of the Covid-19 pandemic (lower volumes delivered and connection services) and mild weather, supported by changes in the TURPE 5 tariff indexation (see note 5.1.1).

Despite growth in generation activities, EDF Renewables' operating profit before depreciation and amortisation was down by €(274) million, mainly due to a lower volume of development and sales of structured assets (€(0.3) billion) following the sale of 50% of the offshore wind farm NnG in 2019.

The €76 million increase in operating profit before depreciation and amortisation in the United Kingdom segment is notably attributable to the positive effect of higher nuclear power prices, counterbalanced by the Covid-19 pandemic effects (€(0.2) billion) and lower levels of nuclear generation.

In the Other activities, the €(226) million decline in operating profit before depreciation and amortisation is due to the €(122) million effect in gas activities, principally reflecting an increase in provisions for onerous contracts and a €(82) million downturn at EDF Trading, which achieved a steady performance in 2020 after an excellent performance in 2019.

5.1 SALES

Accounting principles and methods

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.

Some Group entities conduct optimisation operations on the wholesale gas and electricity markets, to balance supply and demand in compliance with the Group's risk management policy. The sales concerned are recorded net of purchases. When an entity has a net short position in euros, it is included in "energy sales". A net long position in euros is included in "fuel and energy purchases".

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

- when these services are not distinct from the energy supply service;
- 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.

Income from connections to the French electricity network is recognised in sales at the date when the connection becomes operational.

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.

Trading activities

Sales revenues include the margin realised, essentially by EDF Trading, on energy market trading operations that fall within the scope of IFRS 9, which are recognised at fair value.

EDF Trading is the Group's trading entity. It operates on the markets on behalf of other Group entities and through trading activity for its own purposes or for non-Group entities, backed by the Group's industrial assets and within its assigned risk mandate.

EDF Trading trades on organised or OTC markets in derivatives such as futures, forwards, swaps and options.

EDF Trading undertakes purchase and sale operations on the wholesale markets in Europe and North America for:

- electricity and fuel (principally gas);
- CO_2 emission permits, weather derivatives and other environmental instruments;
- capacity guarantees for electricity production.

EDF Trading also operates in the unregulated North American markets as part of its energy supply activities.

LNG optimisation and trading activities are carried out through the investment in Jera Global Markets, a joint venture with Jera.

Capacity mechanism

Capacity mechanisms have been set up in France, the UK and Italy 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 plants 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 network 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, as an operator of electricity plants (EDF SA, Dalkia, EDF Renewables), as an electricity supplier (EDF SA, Électricité de Strasbourg) and as a purchaser of power to compensate for network losses (Enedis and Électricité de Strasbourg).

In view of the Covid-19 pandemic's effects on electricity supply security for the winter 2020-2021, and to maximise the utility and efficiency of the capacity mechanism, RTE made exceptional adjustments to certain conditions and relaxed certain regulatory constraints for capacity operators willing to increase their availability (notably waiving higher balance adjustment fees and late certification fees).

RTE thus issued a summary of transparency information currently available on the capacity mechanism on 18 September 2020, to enable the actors to assess the supply-demand balance situation for capacity guarantees in the mechanism for the next few years.

RTE also organised two further balance adjustment sessions for 2020, and made changes to the 2021 Demand Response tenders to make it more attractive. The volumes offered and accepted doubled, and a bonus was added for capacities that could be offered as soon as November 2020.

2020 registered a significant increase in capacity prices for 2020 and subsequent years from the auction in June. This is mainly explained by the market actors anticipating lower fleet availability for peak periods, in the context of the Covid-19 crisis (see note 1.4.1).

The market reference prices for 2017, 2018, 2019 and 2020 were established respectively at €10.0/kW, €9.3/kW, €17.4/kW and €19.5/kW. Six auctions held in 2020 (March, April, June, September, October, December) for deliveries in 2021 resulted in the following prices, in chronological order: €19.5/kW, €19.2/kW, €47.4/kW, €29.5/kW, €32.7/kW, and €39.1/kW.

The delivery year 2022 was also opened to auction in 2020. The four capacity auctions held resulted in the following prices, in chronological order: €16.6/kW, €38.9/kW, €18.1/kW and €18.2/kW.

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. In addition, the ARENH price, although it has not changed since first set up, is considered to have 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 operators of installations, if the effective capacity is lower than the certified capacity, a liability (accrued expenses or provision) is recorded equivalent to the best estimate of the expense necessary to extinguish the obligation (rebalancing or settlement mechanism);
- 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 was introduced in 2014 to ensure security of electricity supply by providing a payment for reliable sources of capacity, alongside their electricity revenues, to ensure they deliver

energy when needed. It is based on a system of auctions for operators, organised by the network operator "National Grid" to procure capacity 4 years ahead of delivery; delivery years run from 1 October to 30 September. Capacity operators which have been successful at the auctions 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 energy purchases 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. No capacity market revenues were thus recognised for the suspension period in 2018.

On 24 October 2019, following an in-depth investigation, the European Commission reapproved the UK capacity market scheme under EU State aid rules. The decision enabled payments that had been suspended since November 2018 to be made. Suppliers were required to make back-payments of the capacity supplier charge in 2019 and capacity providers have recognised revenue for the whole suspension period with cash received in January and February 2020.

Italian system: A capacity mechanism was set up in 2019 using rules approved in a decree of 28 June 2019 issued by the Economic Development Ministry.

This mechanism is based on an auction process organised by TERNA, the Italian transmission grid operator, for each delivery year. Operators of existing and future production or storage units can participate in the auctions. The operators of the capacities selected are paid through a fixed premium during one year for existing capacities and 15 years for future capacities. The fixed premium is paid during the delivery year.

The selected operator must offer its capacity on the day-ahead market (*Mercato del Giorno Prima*) and the balancing market (*Mercato per il Servizio di Dispacciamento*). If the selling price on these markets reaches a level exceeding a strike price defined by the Italian Regulatory Authority for Energy, Networks and Environment (ARERA), the operator must repay the surplus to TERNA.

Two auctions were held during 2019 for delivery dates set in 2022 and 2023, and Edison won 3.8GW for 2022 and 3.3GW for 2023 for an annual price of €75,000/MW for new capacities and €33,000/MW for existing capacities. Edison did not participate in any auction in 2020.

The fixed premium is recorded in income during the corresponding delivery year, and reduced if appropriate by any repayments made to TERNA, or if the power plant is unavailable.

5.1.1 Regulatory changes in France

Regulated electricity sales tariffs in France – "Blue" tariffs

In accordance with article L. 337-4 of the French Energy Code, regulated electricity sales tariffs are set by the Ministers for Energy and the Economy following proposals by the French Energy Regulatory Commission (*Commission de Régulation de l'Énergie* or CRE).

France's Council of State ruled in decisions of 18 May and 3 October 2018 that the principle of regulated electricity sales tariffs is compatible with European Union law when such tariffs serve the general economic interest objective of guaranteeing consumers an electricity price that is more stable than market prices.

In accordance with European Directive 2019/944 of 5 June 2019 on common rules for the internal market for electricity, the French Energy and Climate law of 8 November 2019 authorises continuation of regulated sales tariffs, but they are reserved for residential or business consumers with a subscribed power level of up to 36kVA, provided they have fewer than 10 employees and their annual sales, income or balance sheet total is below €2 million.

France's Energy and Climate law, which sets out the terms of the partial discontinuation of regulated sales tariffs for non-residential customers, and the associated implementing decisions, are presented in note 4 to the consolidated

financial statements at 31 December 2019.

2020 was marked by implementation of laws, particularly regarding:

- identification of customers' eligibility or non-eligibility for regulated sales tariffs;
- making data available to other suppliers; and
- informing non-eligible customers of the termination date of their regulated-tariff contract and the need to subscribe a market-rate contract taking effect no later than 1 January 2021 with the supplier of their choice. Customers failing to do so accept automatically to switch to a market-rate contract validated by the CRE with their current supplier.

Tariff changes

In accordance with the article L. 337-4 of the French Energy Code, the CRE is 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.

In a decision of 16 January 2020, the CRE proposed an increase of 2.4% (including taxes) in the "blue" tariffs for residential and non-residential customers (3.0% excluding taxes for residential customers and 3.1% excluding taxes for non-residential customers). This proposed increase takes account of the rise in prices on the wholesale energy markets, the level of ARENH curtailments for 2020, higher selling costs including the costs of purchasing energy savings certificates, and the adjustments made to narrow the gap between costs and revenues observed on regulated electricity sales tariffs during 2019. This CRE proposal was confirmed by tariff decisions of 29 January 2020 that were published in the *Journal officiel* of 31 January 2020, and applied from 1 February 2020.

In a decision of 2 July 2020, in view of changes in the TURPE network access tariffs applicable from 1 August 2020 and in application of the Energy Code, the CRE proposed an increase of 1.54% including taxes (1.82% excluding taxes) in the "blue" tariffs for residential customers and 1.58% including taxes (1.81% excluding taxes) in the "blue" tariffs for non-residential customers. This CRE proposal was confirmed by a tariff decision of 29 July 2020 that was published in the *Journal officiel* of 31 July 2020, and applied from 1 August 2020.

In a decision of 14 January 2021, the CRE proposed an increase of 1.61% including taxes (1.93% excluding taxes) in the "blue" tariffs for residential customers and 2.61% including taxes (3.23% excluding taxes) in the "blue" tariffs for non-residential customers from 1 February 2021. This proposed increase takes particular account of the rising cost of energy supplies and capacity guarantees, the "catch-up" adjustment to cover the cost-income differential on regulated sales tariffs in 2019 and 2020, movements in selling costs associated with unpaid receivable forecasts for 2021, particularly in the context of the Covid-19 pandemic, and adjustment of selling costs for non-residential customers who are still eligible for the regulated tariffs. This CRE proposal was confirmed by tariff decisions of 28 January 2021 that were published in the *Journal officiel* of 31 January 2021, and has applied since 1 February 2021.

"TURPE" Network access tariffs

The costs borne by the network operators Enedis and RTE for management of the public electricity transmission and distribution networks are covered by the "TURPE" tariffs for using the networks, as stipulated in Articles L. 341-2 and following of the French Energy Code.

These tariffs apply to users connected to the distribution and transmission networks.

The TURPE tariffs are approved by the Ministry for the Ecological Transition following reasoned proposals submitted by the CRE.

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 from 1 August 2017 to 31 July 2021.

On 28 June 2018, the CRE adopted a decision regarding the TURPE 5 HTA-BT (medium voltage – low voltage) tariff and the new version of that tariff from 1 August 2018, known as the "second TURPE 5 HTA-BT". Among other things, this decision reflected implementation of the Council of State's partial cancellation decision of 9 March 2018. This decision had 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 CRE published two decisions on the TURPE 6 Transmission (high voltage) and TURPE 6 Distribution (medium voltage – low voltage) on 21 January 2021, after the Higher Energy Council (*Conseil supérieur de l'énergie*) gave its approval. These tariffs will apply from 1 August 2021 to 31 July 2025.

TURPE 5 Transmission tariffs

On 6 June 2019 the CRE adopted a decision concerning the TURPE 5 tariff for the high voltage network and its revision at 1 August 2019. The tariff scale increased by an average 2.16% from 1 August 2019, comprising +1.61% for inflation and +0.55% to balance the income and expenses adjustment account (CRCP[1]).

On 14 May 2020, the CRE adopted a decision reducing the TURPE 5 tariff for the high voltage network by -1.08% from 1 August 2020, comprising +0.92% for inflation, and -2% to balance the CRCP.

TURPE 6 Transmission tariffs

In decision n° 2021-12 of 21 January 2021, the CRE set a nominal pre-tax weighted average cost of capital (WACC) of 4.6% for the return on RTE's asset base, compared to 6.125% for TURPE 5. The average tariff increase will be +1.09% at 1 August 2021 and an average +1.57% per year for the whole tariff period, assuming average annual inflation of 1.07% over that period. The CRE's decision on the TURPE 6 Transmission tariff was published on 21 January 2021.

Second TURPE 5 Distribution tariffs

On 25 June 2019 the CRE adopted a decision concerning revision of the TURPE 5 tariff for the medium and low voltage network at 1 August 2019. The tariff scale increased by an average +3.04% from 1 August 2019, comprising +1.61% for inflation, +1.45% to balance the CRCP, and -0.02% in application of the Council of State's decision of 9 March 2018.

By a decision of 20 May 2020, the CRE adopted a +2.75% increase to the second TURPE 5 tariff for the medium and low voltage network from 1 August 2020. This increase comprises +0.92% for inflation, +1.85% to balance the CRCP, and -0.02% in application of the Council of State's decision of 9 March 2018.

TURPE 6 Distribution tariffs

In decision n° 2021-13 of 21 January 2021, the CRE asset the margin on assets at 2.5% (unchanged from the Second TURPE 5) and the additional return on regulated equity at 2.3% (compared to 4% for the Second TURPE 5, principally as a result of the lower market rates and lower corporate income tax rates). The average tariff increase will be +0.91% at 1 August 2021 and +1.39% per year for the whole tariff period, assuming average annual inflation of 1.07% over that period. The CRE's decision on the TURPE 6 Distribution tariff was published on 21 January 2021.

Supplier commissioning

After Law 2017-1839 of 30 December 2017 confirmed the CRE's competence for supplier commissioning, the CRE issued a decision on 18 January 2018 reiterating the principles adopted in its previous decision of 26 October 2017 regarding remuneration payable by distribution network operators to suppliers for the service of managing single-contract customers on their behalf.

This decision upheld the principle of identical commissions for all suppliers selling single-contract market-price offers. Only regulated electricity tariffs were to give rise to slightly lower commissions (€4.50 instead of €6.80 per point of delivery until 1 August 2019), with progressive reduction of this difference to zero by 1 August 2022.

For remuneration of past customer management charges (prior to 1 January 2018), the CRE's decision set an amount it considered 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. In the course of this litigation, ENGIE filed an application for a preliminary ruling on constitutionality concerning the arrangements introduced by the French "Hydrocarbons" law which ended the possibility of obtaining supplier commissioning for past services. These arrangements were validated by the Constitutional Council in its decision 2019-776 of 19 April 2019. The proceedings at the Paris Commercial Court are still ongoing.

Electricity Equalisation Fund

The TURPE tariff for the medium and low-voltage network is identical for every electricity network operator. It is determined on the basis of forecast expenses to be borne by Enedis, provided they correspond to an efficient network operator, and forecasts of the number of consumers connected to Enedis' networks, their consumption, and the power level subscribed.

As this tariff cannot always cover the specific needs of certain service zones, the Electricity Equalisation Fund (FPE) exists to compensate for disparities in network operating conditions. The Energy Code requires electricity distribution costs resulting from public network operation to be shared between public distribution network operators. A normative formula for calculating the cost allocation is defined in a decree and a ministerial order and applies to all distribution

1 *A mechanism to measure and offset main differences between the actual figures and the forecasts on which tariffs are based*

network operators: in the EDF Group, the entities concerned are Enedis, Electricité de Strasbourg and SEI.

On 23 July 2020, the CRE published its decision setting the final amount of the allocation from the Electricity Equalisation Fund (*Fonds de Péréquation de l'Electricité*) to SEI, Électricité de Mayotte and Gérédis, the three operators that opted for assessment based on the CRE's analysis of their accounts. SEI's allocation is set at €198.5 million for 2020.

The ministerial order of 22 October 2020 describes the contributions payable and allocations receivable from the Electricity Equalisation Fund for operators in the distribution network it covers for 2020. The fixed contributions due by Strasbourg Electricité Réseaux and Enedis amount to €2.5 million and €27.7 million respectively

ARENH

The ARENH[1] scheme for regulated access to historic nuclear power, set up in 2011, entitles alternative suppliers to purchase electricity from EDF to supply their final customers, after signing a framework agreement, at a regulated price for set quantities determined under the provisions of the French Energy Code. This scheme is also open to network operators to cover their energy losses.

The ARENH price, determined by the Ministers for Energy and the Economy following a proposal by the CRE, has been maintained at €42/MWh since January 2012. This includes delivery of the electricity and is considered to incorporate the associated capacity guarantees.

The maximum total volume that can be sold under the ARENH system to suppliers who apply to the scheme to cover the needs of their final customers was initially set at 100TWh per year.

In decision 2020-277 of 12 November 2020, as required by the Energy Code, the CRE set out the method for allocating ARENH volumes if applications exceed the maximum total volume defined for 2021. This decision stipulated that if the ARENH was oversubscribed in November 2020, curtailment would only apply to new ARENH applications made in the session concerned.

It also stated that EDF-controlled subsidiaries' excess applications would be fully curtailed (this does not apply to network operators) and they could enter into contracts with the parent company that replicate the ARENH system and terms of supply, particularly the curtailment rate for alternative suppliers. In the method proposed by the CRE in decision 2020-002 concerning regulated sales tariffs for electricity, this curtailment mechanism, when applied, makes reference to market prices more influential in determining regulated sales tariffs.

Decree 2020-1414 of 19 November 2020 modified the regulatory section of the Energy Code concerning the ARENH and CSPE mechanisms, setting out the method for allocating the ARENH price supplement paid between suppliers and EDF, and assigning to the CRE the task of defining the methods for calculation and allocation of the ARENH price supplement if the maximum volume is reached. The same decree modified the measures applicable in the event of default on payment, stipulating that the purchaser concerned is banned from ARENH sales for a one-year period as soon as the electricity transfer is first stopped.

The Energy and Climate law of 8 November 2019 introduced new measures. It raised this initial 100TWh ceiling to 150TWh from 1 January 2020, allowing the French government to raise the maximum total volume of ARENH deliveries above 100TWh, and to revise the ARENH price by ministerial decision during a transition period. However, the Ministry for the Ecological and Inclusive Transition announced that no change would be made to the ARENH price or volume for 2021.

ARENH applications during the November 2020 session for delivery in 2021 totalled 146.2TWh (excluding applications from EDF subsidiaries). Since the maximum total volume has not been modified, the volume to be delivered totalled 100TWh and as in the previous year the CRE curtailed each supplier's application. Further volumes were also sold by EDF to its subsidiaries through contracts that replicate the ARENH mechanism, and to compensate for network losses (26.3TWh).

In the context of the Covid-19 pandemic, in decision 2020-071 of 26 March 2020 the CRE introduced measures in favour of suppliers with respect to the ARENH mechanism. These measures consisted of cancelling the "CP2[2]" penalty for excessive ARENH applications for the year 2020, and deferring settlement of ARENH invoices upon request by the supplier, under the terms defined in ordinance 2020-316 of 25 March 2020 on settlement of invoices, as detailed in CRE decision 2020-076 of 9 April 2020.

EDF has also offered special payment terms to small suppliers in a fragile position. The application methods for these terms were established by CRE decision 2020-076 of 9 April 2020.

1 *Accès Régulé à l'Énergie Nucléaire Historique*

2 *Penalties for excessive ARENH applications*

Litigation relating to the ARENH mechanism has also been instigated by some energy suppliers in the context of the Covid-19 pandemic. Details are provided in note 1.4.1.

In its decision 2020-315 of 17 December 2020, the CRE proposed changes to the ARENH master agreement model to incorporate the modifications introduced by decree 2020-1414 and in decisions 2020-277 of 12 November 2020 and 2020- 285 of 2 December 2020, the CRE set out the methods for calculation and allocation of the ARENH price supplement if the maximum volume is reached.

5.1.2 Sales

Sales are comprised of:

(in millions of euros)	2020	2019[1]
Sales of energy and energy-related services	62,918	65,790
– energy[2]	*43,767*	*46,620*
– energy-related services (including delivery[3])	*19,151*	*19,170*
Other sales of goods and services	5,201	4,531
Trading	912	1,026
SALES	**69,031**	**71,347**

[1]Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).

[2]Sales of energy include €1,112 million of sales related to optimisation operations on the wholesale gas and electricity markets in 2020 (€1,548 million in 2019). These operations are carried out by certain Group entities to balance supply and demand, in compliance with the group's risk management policy. In 2020, the principal operating segments with a net short position in euros on the markers are France – Generation and supply (gas), Italy (electricity) and the United Kingdom (electricity). In 2019, the segments were the same.

[3]Delivery services included in this item concern the distribution network operators Enedis, Electricité de Strasbourg and EDF SA for non-interconnected zones. However, delivery services concerning EDF Energy and Edison are included in Sales of energy, because those entities are classified as the principal under IFRS 15 for both supply and delivery. The delivery services by EDF Energy and Edison have no impact on net income because they are included in "Transmission and delivery expenses" in note 5.2.

After elimination of foreign exchange effects and changes in the scope of consolidation, the Group's sales decreased by 3.4% or €(2.4) billion including the €(2.3) billion effect of the Covid-19 pandemic. The segments mainly concerned by this decline in sales were Italy (-21.8% or €(1.6) billion), Other activities (-19.5% or €(0.4) billion), Dalkia (-8.9% or €(0.3) billion), and the United Kingdom (-1.9% or €(0.2) billion), while an increase was observed in the France – Generation and Supply segment (+0.6% or +€0.2 billion).

The €0.2 billion increase in sales by the France-Generation and Supply segment despite the €(1.1) billion effects of the Covic-19 pandemic is explained by energy price effects (including the increases in the regulated sales tariffs, see the paragraph above on regulated tariffs) and the higher capacity revenue (see the paragraph above on capacity mechanisms), partly offset by the lower nuclear power output excluding Covid-19 effects.

The rise in sales in the France-Regulated activities (+€0.1 billion) is more particularly attributable to changes in the TURPE 5 tariffs following the increases applied in 2020 (see the paragraph above on regulated tariffs) at a time when quantities delivered saw a significant downturn due to the very mild weather of 2020 and the effects of the Covid-19 pandemic (€(0.3) billion).

The lower level of sales by the Italy segment observed in 2020 (€(1.6) billion) is mainly explained by unfavourable price and volume effects on gas business estimated at €(1.5) billion, in line with falling prices across all markets, and also by mild weather and an unfavourable price effect in electricity business, estimated at €(0.2) billion.

The €(0.4) billion decrease in sales by the Other activities segment was essentially caused by LNG activities which were weakened by the significant decrease in wholesale prices and lower use of Group capacities.

Dalkia registered a €(0.3) billion decline in sales, against an unfavourable background of energy price movements and the Covid-19 pandemic (which had a €(0.2) billion on Dalkia's sales).

In the United Kingdom, sales were down by €(0.2) billion, principally due to the unfavourable effects of the Covid-19 pandemic (€(0.5) billion), lower nuclear power output and lower capacity revenue, despite the favourable effects of the higher realised sales prices for nuclear power.

5.2 FUEL AND ENERGY PURCHASES

Fuel and energy purchases comprise:

(in millions of euros)	2020	2019[1]
Fuel purchases used – power generation[2]	(10,162)	(11,700)
Energy purchases[2]	(14,645)	(15,041)
Transmission and delivery expenses	(7,916)	(8,325)
Gain/loss on hedge accounting	(22)	(7)
(Increase)/decrease in provisions related to nuclear fuels and energy purchases	320	(18)
FUEL AND ENERGY PURCHASES	**(32,425)**	**(35,091)**

[1]Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).

[2]Fuel purchases used and Energy purchases include respectively €514 million and €1,674 million for optimisation operations on the wholesale gas and electricity markets in 2020 (€417 million and €3,117 million in 2019). In 2020 the principal operating segments with net long positions in euros on the markets are France – Generation and Supply (electricity), the United Kingdom (gas), Other international (Luminus – gas and electricity) and Dalkia (gas). In 2019, the segments were the same.

Fuel purchases used include costs relating to raw materials for energy generation (nuclear fuels, fissile materials, gas, coal, oil and biomass), 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 purchases made under the purchase obligation mechanism in France.

5.3 PERSONNEL EXPENSES

Personnel expenses comprise:

(in millions of euros)	2020	2019[1]
Wages and salaries	(9,024)	(8,914)
Social contributions	(2,020)	(1,951)
Employee profit sharing	(271)	(277)
Other contributions related to personnel	(347)	(360)
Other expenses linked to short-term benefits	(219)	(251)
Short-term benefits	**(11,881)**	**(11,753)**
Expenses under defined-contribution plans	(952)	(988)
Expenses under defined-benefit plans	(944)	(801)
Post-employment benefits	**(1,896)**	**(1,789)**
Other long-term expenses	(155)	(222)
Termination payments	(25)	(33)
Other personnel expenses	**(180)**	**(255)**
PERSONNEL EXPENSES	**(13,957)**	**(13,797)**

[1]Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).

Excluding foreign exchange effects and changes in the scope of consolidation, personnel expenses increased by 1.1% from 2019, mainly in the France – Regulated activities, EDF Renewables segments and Dalkia.

Average workforce comprise:

	2020	2019
IEG status	95,530	96,818
Other	65,673	64,704
AVERAGE WORKFORCE	**161,203**	**161,522**

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 Universal Registration Document in section 3.4.2.1.1, “Workforce of the EDF group”.

5.4 OTHER OPERATING INCOME AND EXPENSES

Other operating income and expenses comprise:

(in millions of euros)	Notes	2020	2019 [1]
Operating subsidies	5.4.1	8,305	7,834
Net income on deconsolidation	5.4.2	221	576
Gains on disposal of fixed assets	5.4.2	(229)	(188)
Net increase in provisions on current assets [2]		(203)	(107)
Net increase in provisions for operating contingencies and losses		(348)	(54)
Other items	5.4.3	(1,963)	(1,374)
OTHER OPERATING INCOME AND EXPENSES		**5,783**	**6,687**

[1] *Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).*
[2] *See the impairment of trade receivables as a result of the Covid-19 pandemic in note 1.4.1.2.*

5.4.1 Operating subsidies

This item mainly comprises the subsidy received or receivable by EDF in respect of the compensation for public energy charges (CSPE), excluding the annual repayment of the past CSPE receivable and associated interest, reflected in the financial statements through recognition of income of €8,081 million for 2020 (€7,662 million for 2019). The operating receivable corresponding to the CSPE is recorded in other liabilities at 31 December 2020 (see note 13.3.4).

Compensation for public energy charges (CSPE) (France)

Mechanism

The compensation mechanism for public energy service charges (*compensation des Charges de Service Public de l'Energie*) resulted 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 2020 marked a continuation from 2019, defining the following measures for compensation of charges for 2020:

- a special "energy transition" budget item of €6.3 billion, principally to compensate for the additional costs associated with all contracts obliging the operators to purchase renewable energies and (to a much smaller degree) biogas, and covering the last annual contribution to repayment of the accumulated shortfall in compensation due to EDF;
- a "Public Energy Service" item of €2.7 billion in the general budget, notably 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.

From 1 January 2018, the "basic necessity" rates for electricity and the "special solidarity" rates for gas were replaced by an energy voucher system. The cost of this system is not borne by EDF, but budgeted by the State in the "Public Energy Service" programme. EDF has borne solidarity charges for the national housing solidarity fund and services for vulnerable customers in both 2019 and 2020.

In 2020, 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 latter providing most of the funding. The finance law for 2020 replaced 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. The initial French finance law for 2020 also proposes to discontinue this "energy transition" budget item in 2021, with the costs concerned subsequently covered directly by the general

budget;

- other public service charges excluding costs associated with the subsidy mechanisms for renewable energies (i.e. costs relating to 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 Compensation for Public Electricity Charges (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 was set in 2016 at a full rate of €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 level remains unchanged in 2020.

The amended finance law no. 4 for 2020 also applied an upward adjustment to the amounts of compensation payable by the State in 2020 for:

- public service charges borne in 2019 (the total differential observed between the readjusted forecast for 2019 charges established in July 2019 and the actual charges for 2019 observed in July 2020);
- and public service charges borne in 2020 (the partial differential between the initial forecast for 2020 charges established in July 2019 and the readjusted forecast established in July 2020).

These expenses had increased due to the larger differential between the market price for electricity and the purchase obligation tariff payable to producers.

5.4.2 Net income on deconsolidation and gains on disposal of fixed assets

In 2020, 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 €210 million (€560 million in 2019 including notably the sale of NnG (see note 3.1.2).

5.4.3 Other items

Other items mainly include costs relating to energy savings certificates used or consumed during the year, additional remuneration paid to producers of electricity from renewable sources in France and losses consisting of non-recoverable operating receivables. The unfavourable change in other items in 2020 is principally explained by the increase in this additional remuneration and the rising costs related to energy savings certificates.

The additional remuneration paid to electricity producers using renewable energies was introduced by France's law on the Energy Transition for green growth. It is a support mechanism intended to guarantee reasonable remuneration for producers who sell their energy directly on the markets, by compensating for the differential between the revenues from those sales and a reference amount. This mechanism complements the purchase obligation system.

From the first half of 2020, other items also include income and expenses related to closure of the Fessenheim plant.

Closure of Fessenheim nuclear power plant

In accordance with the application for termination of operations and the declaration of the permanent shutdown of both reactors at Fessenheim nuclear power plant sent by EDF to the Minister for the Ecological and Inclusive Transition and to the ASN on 30 September 2019, EDF shut down reactor 1 on 22 February 2020 and reactor 2 on 30 June 2020.

On 27 September 2019, due to the cap on nuclear power output set by the "energy transition for green growth" law of 17 August 2015, the French State and EDF signed a protocol agreement whereby the State will compensate EDF for the early closure of Fessenheim.

The compensation paid under the terms of this protocol comprises: ws

- Initial instalments to compensate for expenses incurred after the closure of the plant (end-of-operations expenditure, BNI taxes, dismantling costs and staff redeployment costs), which will be paid over a 4-year period following the closure. An amount of €370 million was received on 14 December 2020 (see note 13.5);

  This compensation is recognised as income in profit and loss as and when the associated costs are incurred;

- Subsequent payments corresponding to the lost income that would have been generated by future power generation up until 2041, based on Fessenheim's previous output figures and calculated "ex post" on the basis of nuclear

power sale prices, particularly observed market prices.

Since its decoupling from the network, the Fessenheim plant has entered a post-operating phase that will last approximately five years. During that period, units 1 and 2 will continue to be operated and maintained as "defueled core" and "evacuated fuel" reactors. This will require a series of technical and administrative operations.

All the post-operating expenses and income associated with the closure of the two units in 2020 are recognised in other operating income and expenses. At 31 December 2020, they mainly comprise:

- expenses of €113 million (salaries and social security charges for labour at the site amounting to €42 million, purchases of goods and services amounting to €43 million, taxes other than income taxes, mainly payroll taxes, energy taxes and local taxes amounting to €28 million);
- the compensation defined in the protocol for expenses that will be incurred after the closure, amounting to €50 million, recognised as an operating subsidy in the income statement under the methods explained above.

Energy savings certificates

Accounting principles and methods

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 became subject to energy savings obligations, initially for a three-year period.

To meet this obligation, three sources are available to the EDF group: supporting consumers in their energy efficiency operations, funding ministry-approved energy savings certificate schemes, and purchasing certificates from eligible actors.

Expenses incurred for this purpose are recorded in expenses of the year concerned, in "Other operating income and expenses". Expenses in excess of the accumulated obligation at year-end are included in inventories and may be used to cover the obligation in later years.

A provision is recognised if the energy savings achieved are lower than the cumulative energy savings obligation at the year-end. The amount of the provision is equal to the cost of actions still to be taken to extinguish the obligations related to the energy sales made.

Energy saving regulations in France

Decree 2017-690 of 2 May 2017 issued by the French Ministry for the Environment, Energy and the Sea substantially raised the obligation levels for the fourth period of energy savings obligations (initially running from 1 January 2018 to 31 December 2020) to 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.

Law no. 2019-1147 of 8 November 2019 relating to Energy and the Climate, as well as prolonging the fourth period of the energy savings certificates scheme, included a chapter on measures against fraud concerning these certificates designed to increase the number and effectiveness of controls and sanctions.

If there is a shortfall in certificates surrendered at the end of the period, obligated actors must pay a fine of €15 per MWhc of shortfall.

In order to fulfil these obligations, the Group made every effort to gradually increase its number of energy savings certificates, taking advantage of the "*Coup de pouce*" operations launched in France early in 2019 (subsidies for insulation, financial aid for replacing oil heating by heat pumps, 50% additional energy savings subsidy for heat pump users, special offers for heat pump maintenance contracts, etc).

The Group currently considers that due to the combined effect of the expected increase in certificates earned by the end of 2021 and the extension of the fourth period, there is no risk of a shortfall in energy savings certificates at the end of the period.

NOTE 6 NET CHANGES IN FAIR VALUE ON ENERGY AND COMMODITY DERIVATIVES, EXCLUDING TRADING ACTIVITIES

Accounting principles and methods

This item essentially consists of changes over the period in the fair value of derivatives used for economic hedging of commodity purchases or sales that are not eligible for hedge accounting as defined in IFRS 9, and are therefore included directly in profit and loss. The Group report these changes in 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.

(in millions of euros)	2020	2019
NET CHANGES IN FAIR VALUE ON ENERGY AND COMMODITY DERIVATIVES, EXCLUDING TRADING ACTIVITIES	(175)	642

Net changes in fair value on Energy and Commodity derivatives, excluding trading activities, decreased from €642 million in 2019 to €(175) million in 2020, principally due to high price volatility observed on the markets for other commodities, especially electricity (a mainly price-related rather than volume-related effect), and Edison's gas positions.

NOTE 7 OTHER INCOME AND EXPENSES

Other income and expenses amount to €(487) million for 2020. They principally comprise exceptional additional costs relating to repair work on the main secondary circuit welds in the Flamanville 3 EPR, totalling €(397) million in the first half of 2020. These additional costs are considered as abnormal costs under IAS 16 (paragraph 22) and cannot be included in the cost of assets under construction.

Other income and expenses includes restructuring expenses in certain Group entities, and other items which are operating income and expenses by nature but of non-significant amounts individually.

Other income and expenses amounted to €(185) million for 2019. They included the €(30) million cost of the ERO 2019 employee shareholding offer undertaken during the first half of 2019, restructuring expenses in certain Group entities, and other items which are operating income and expenses by nature but of non-significant amounts individually.

NOTE 8 FINANCIAL RESULT

8.1 COST OF GROSS FINANCIAL INDEBTEDNESS

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

(in millions of euros)	2020	2019
Interest expenses on financing operations[1]	(1,699)	(1,801)
Change in the fair value of derivatives and hedges of liabilities	90	(14)
Transfer to income of changes in the fair value of cash flow hedges	(8)	(40)
Net foreign exchange gain on indebtedness	7	49
COST OF GROSS FINANCIAL INDEBTEDNESS	(1,610)	(1,806)

[1] Interest expenses on financing operations includes interest on the IFRS 16 lease liability amounting to €(80) million in 2020 and €(85) million in 2019.

8.2 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.

Details of the final discount effect are as follows:

(in millions of euros)	2020	2019
Provisions for long-term and post-employment employee benefits [1]	(637)	(931)
Provisions for the back-end of the nuclear cycle, decommissioning and last cores [2]	(2,679)	(2,116)
Other provisions and advances	(417)	(114)
DISCOUNT EFFECT	**(3,733)**	**(3,161)**

[1] *See note 16.1.3.*
[2] *Including the effect of discounting the receivable corresponding to amounts reimbursable by the NLF (see note 18.1.3).*

The increase in the unwinding discount effect on nuclear provisions is mainly due to a decrease in the real discount rate applied for nuclear provisions in France of 20bp in 2020 (compared to 10bp in 2019).

The increase in the unwinding discount effect on "other provisions and advances" is explained by substantially lower discount rates in 2020 than 2019 for these provisions (mainly provisions for onerous contracts), as a result of the change in method for determining discount rates, which now refers to an interest rate curve (see note 15.1.1.5).

8.3 OTHER FINANCIAL INCOME AND EXPENSES

Other financial income and expenses comprise:

(in millions of euros)	2020	2019[1]
Financial income on cash and cash equivalents	35	17
Gains/(losses) on other financial assets (including loans and financial receivables)	181	248
Gains/(losses) on debt and equity securities	691	878
Changes in financial instruments carried at fair value through profit and loss	1,253	2,338
Other financial expenses	(102)	(134)
Foreign exchange gain/loss on financial items other than debts	(254)	(7)
Return on fund assets	378	523
Capitalised borrowing costs	579	740
OTHER FINANCIAL INCOME AND EXPENSES	**2,761**	**4,603**

[1] *Restated for the impacts of IFRS 5 due to the change in scope of E&P operations finalised (see note 1.4.2).*

“Gains/(losses) on debt and equity securities” in 2020 principally include:

- €518 million of dividends and interest income on debt securities (€740 million in 2019);
- €173 million of net gains and losses on sales of debt securities carried at fair value through OCI with recycling (including 162 million on dedicated assets), compared to €138 million in 2019 (including €136 million on dedicated assets).

Other financial income and expenses include changes in fair value on financial instruments, amounting to €1,253 million. With the high market volatility, notably caused by the Covid-19 pandemic, this favourable overall change for the year was driven by a €1,214 million increase in the fair value of debt and equity securities (including €1,218 million relating to dedicated assets) and a €39 million increase in the fair value of derivatives. In 2019, changes in financial instruments carried at fair value through profit and loss amounted to €2,338 million, including €2,545 million relating to dedicated assets.

The decrease in capitalised borrowing costs relates to the suspension of capitalisation of interim interest relating to Flamanville 3 between March and July (see note 1.4.1.3).

NOTE 9 INCOME TAXES

Accounting principles and methods

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.

In application of IFRIC 23, a tax asset or liability is recognised when there is uncertainty over income tax treatments. If the Group considers it likely that the tax authorities will not accept its chosen treatment, it recognises a tax liability, and if it considers it likely that the tax authorities will reimburse a tax that has already been paid, it recognises a tax asset. The tax assets and liabilities relating to these uncertainties are estimated on a case-by-case basis and stated at the most likely amount, or the weighted average of the various outcomes considered. These tax assets and liabilities are included in deferred taxes.

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.

9.1 BREAKDOWN OF TAX EXPENSE

Details are as follows:

(in millions of euros)	2020	2019[1]
Current tax expense	(747)	(1,597)
Deferred taxes	(198)	65
TOTAL	**(945)**	**(1,532)**

[1] *Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).*

In 2020, €(604) million of the current tax expenses relates to French companies, and €(143) million relates to other subsidiaries (€(1,519) million and €(78) million respectively in 2019).

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

(in millions of euros)	2020	2019[1]
Income of consolidated companies before tax	**1,293**	**6,393**
Income tax rate applicable to the parent company	32.02%	34.43%
Theoretical tax expense	**(414)**	**(2,201)**
Differences in tax rate[2]	(225)	232
Permanent differences[3]	6	162
Taxes without basis[4]	(27)	118
Unrecognised deferred tax assets[5]	(288)	156
Other	3	1
ACTUAL TAX EXPENSE	**(945)**	**(1,532)**
EFFECTIVE TAX RATE	**73.10%**	**23.96%**

[1]Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).

The income tax expense amounts to €(945) million in 2020, corresponding to an effective tax rate of 73.10% (compared to €(1,532) million in 2019, corresponding to an effective tax rate of 23.96%). The €587 million decrease in the Group's tax expense between 2019 and 2020 essentially reflects the €5,100 million decrease in net income before tax, generating a lower tax charge of €1,633 million; however, the unfavourable Council of State decision issued in December 2020 questioning the tax-deductibility of certain long-term liabilities of EDF SA has an impact of €538 million, including unrecognised tax assets of €(361) million due to the Group's prudent policy concerning recognition of deferred taxes beyond a 10-year horizon; the unfavourable effect of the increase in the income tax rate from 17% to 19% in the United Kingdom; and the absence of any favourable effect of asset disposals in 2020 (after the sales of Alpiq and NnG in 2019).

After elimination of these non-recurring items (principally fair value changes and unrealised gains and losses on financial assets, impairment, the consequences of tax litigation, and the impact of changes in the UK tax rate), the effective current tax rate for 2020 is 19.0%, compared to 18.0% in 2019.

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

- 2020:
  - [2] the unfavourable impact of tax rate differences amounting to €225 million, mainly explained by an increase in the UK income tax rate from 17% to 19% and the difference between the current tax rate (32.02%) and deferred tax rate in France (28.41% or 25.82%, depending on the timing of reversal of the temporary differences);
  - [4] the economic impact of tax litigation, amounting to €(175) million, partly offset by the positive effect of deduction of payments made to bearers of perpetual subordinated bonds amounting to €162 million;
  - [5] the effect of non-recognition of deferred tax assets, amounting to €(288) million, including €(361) million of deferred taxes recognised in connection with tax litigation (resulting from the future deductibility of expenses whose deductibility is temporarily being questioned), due to the Group's prudent policy concerning recognition of deferred taxes beyond a 10-year horizon.
- 2019:
  - [2] the favourable impact of differences in tax rates between the French rate of 34.43%, the Italian rate of 24% and the British rate of 19%, amounting to €185 million;
  - [3] the favourable impact of disposals of investments and assets subject to a reduced tax rate, amounting to €160 million (principally Alpiq and NnG);
  - [4] the impact of deduction of payments made to bearers of perpetual subordinated bonds, amounting to €204 million.

9.3 CHANGE IN DEFERRED TAX ASSETS AND LIABILITIES

(in millions of euros)	2020	2019
Deferred tax assets	557	978
Deferred tax liabilities	(2,295)	(1,987)
Net deferred taxes at 1 January	***(1,738)***	***(1,009)***
Change in net income	(198)	28
Change in equity	(215)	(402)
Translation adjustments	72	(66)
Changes in scope of consolidation[(1)]	69	(275)
Other movements	45	(14)
NET DEFERRED TAXES AT 31 DECEMBER	**(1,965)**	**(1,738)**
Deferred tax assets	1,150	557
Deferred tax liabilities	(3,115)	(2,295)

[(1)]Changes in the scope of consolidation essentially concern the reclassification of E&P concession assets as assets held for sale.

In 2020, €(238) million of the change in deferred tax assets included in equity results from actuarial gains and losses on post-employment benefits (€(69) million in 2019).

9.4 BREAKDOWN OF DEFERRED TAX ASSETS AND LIABILITIES BY NATURE

(in millions of euros)	31/12/2020	31/12/2019
Deferred taxes:		
Fixed assets	(6,194)	(6,141)
Provisions for employee benefits	5,222	5,018
Other provisions and impairment	321	561
Financial instruments	290	74
Tax loss carryforwards and unused tax credits	1,172	1,292
Other	711	333
Total deferred tax assets and liabilities	**1,523**	**1,137**
Unrecognised deferred tax assets	(3,489)	(2,875)
NET DEFERRED TAXES	**(1,965)**	**(1,738)**

At 31 December 2020, unrecognised deferred tax assets represent a potential tax saving of €3,489 million (€2,875 million at 31 December 2019), mainly relating to France and the United States.

In France, this potential tax saving, which amounts to €2,900 million (€2,091 million at 31 December 2019), 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 €428 million (€473 million in 2019) and relates mainly to negative taxable earnings generating losses which can be carried forward until dates between 2030 and 2037 (in the case of losses generated before 31 December 2017), or for an unlimited period (in the case of losses generated after that date).

Recognised deferred tax assets on tax loss carryforwards and unused tax credits amount to €584 million (€543 million in 2019) and principally concern the United States (€151 million in 2020, €197 million in 2019), United Kingdom (€173 million in 2020, €118 million in 2019), France (€52 million in 2020, €37 million in 2019) and in Germany (€47 million in 2020, €26 million in 2019). 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 10 PROPERTY, PLANT AND EQUIPMENT AND INTANGIBLE ASSETS (EXCLUDING FRENCH PUBLIC ELECTRICITY DISTRIBUTION CONCESSION ASSETS)

Details of property, plant and equipment and intangible assets (excluding French electricity distribution concession assets) are as follows:

(in millions of euros)	Notes	31/12/2020	Assets in progress [1]	31/12/2019	Assets in progress[1]
Goodwill	10.1	10,265	n.a.	10,623	n.a.
Other intangible assets	10.2	9,583	1,581	9,350	1,415
Property, plant and equipment used in generation and other tangible assets owned by the group, including right-of-use assets	10.3	92,600	39,460	89,099	34,755
- Right-of-use assets	*10.4*	*4,116*	*n.a.*	*4,333*	*n.a.*
Property, plant and equipment operated under concessions other than French electricity distribution concessions	10.5	6,858	574	6,860	1,155
TOTAL PROPERTY, PLANT AND EQUIPMENT AND INTANGIBLE ASSETS (EXCLUDING FRENCH ELECTRICITY DISTRIBUTION CONCESSION ASSETS)		**119,306**	**41,615**	**115,932**	**37,325**

[1] *Assets in progress are presented in note 10.6.*

10.1 GOODWILL

Accounting principles and methods

Determination of goodwill

In application of IFRS 3, "Business combinations"(see note 3), 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.

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 10.8.

In 2020, goodwill primarily related to Framatome (€1,332 million) and EDF Energy (€7,569 million). The breakdown by operating segment is presented in note 4.1.

Changes in goodwill in 2020 and 2019 were as follows:

(in millions of euros)	31/12/2020	31/12/2019
Net book value at opening date	**10,623**	**10,195**
Acquisitions	139	66
Disposals	-	-
Impairment (note 10.8)	(31)	(57)
Translation adjustments	(439)	392
Other changes	(27)	27
NET BOOK VALUE AT CLOSING DATE	**10,265**	**10,623**
Gross value at closing date	11,032	11,418
Accumulated impairment at closing date	(767)	(795)

The changes in goodwill in 2020 primarily related to:

- the acquisition of Pod Point by EDF Energy for €74 million, a company specializing in charging for electric vehicles in the United Kingdom;
- the first consolidation of Energy2market for €37 million;
- translation adjustments of €(439) million, principally due to the pound sterling's depreciation against the euro.

The changes in goodwill in 2019 primarily related to:

- the acquisition of Foxguard by Framatome, acquisition of service entities in Belgium, and the first consolidation of the Cyclife subsidiaries in the United Kingdom and Sweden;
- translation adjustments of €392 million, principally due to the pound sterling's rise against the euro.

10.2 OTHER INTANGIBLE ASSETS

Accounting principles and methods

General principles

Other intangible assets mainly comprise:

- software, which is amortised on a straight-line basis over its useful life, including SaaS (Software as a Service) contracts which are not treated as service contracts and included in expenses. To qualify for treatment as fixed assets, SaaS contracts must confer a right of control to the user in addition to access to the software for a fixed period;
- research and development costs that qualify for capitalisation under IAS 38 amortised on a straight-line basis over their foreseeable 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 (in accordance with IFRS 6, "Exploration for and Evaluation of Mineral Resources");
- 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 10.5);
- 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;
- incremental costs of winning or renewing customer contracts, which are amortised over the average duration of customer contracts;
- intangible assets related to environmental regulations.

Intangible assets relating to environmental regulations

These include greenhouse gas emission rights and renewable energy certificates purchased (see notes 20.1.1 and 20.1.2).

Greenhouse gas emission rights

EU Directive 2003/87/EC set up a greenhouse gas emission quota system for the European Union.

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.

In the EDF group, the entities subject to this Directive are EDF, EDF Energy, Edison, Dalkia, and Luminus.

The accounting treatment of emission rights depends on the holding intention. Two economic models coexist in the Group:

- Rights held under the "Trading" model are included in "Other 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 as "Greenhouse gas emission rights – green certificates":
  - 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).

A provision is established at the year-end when the estimated annual emissions by an entity are higher than the rights held or purchased on the forward market, less any rights sold on the forward market (see note 17.2).

This provision is equal to the acquisition cost up to the amount of rights acquired on the spot or forward markets, and to 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 emission rights at the end of the year and not subject to forward sale is higher than the number of rights to 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.

Renewable energy certificates (green 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.

States can use two possible mechanisms to meet these targets:

- introducing a specific sales tariff for energy from renewable sources (this system is used in France and Italy);
- introducing a system of renewable energy certificates to be surrendered by energy suppliers (this system is used in the United Kingdom (Renewable Obligation Certificates) and Belgium (*Certificats Verts*).

For renewable energy certificate systems, the Group applies the following accounting treatment:

- certificates earned through energy generation are not recognised, since their cost is nil;
- certificates purchased are recognised as intangible assets in the line "Greenhouse gas emission rights - green certificates";
- a provision is established to reflect the obligation to surrender certificates. It is based on the cost of certificates earned (with nil value) and purchased (on the spot or forward market), the market price of the certificates still be purchased, and where relevant the market price or penalty price for the balance. The provision is cancelled when the certificates are surrendered to the State (see note 17.2).

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

(in millions of euros)	31/12/2019	Acquisitions	Disposals	Translation adjustments	Changes in scope[2]	Other movements	31/12/2020
Software	5,295	850	(155)	(62)	11	31	**5,970**
Positive fair value of commodity contracts acquired in a business combination	504	-	-	-	-	-	**504**
Greenhouse gas emission rights – green certificates	474	2,056	(1,752)	(13)	-	4	**769**
Other intangible assets	7,919	421	(327)	(44)	(332)	(91)	**7,546**
Intangible assets in development[1]	1,415	175	(4)	(7)	-	2	**1,581**
Gross value	**15,607**	**3,502**	**(2,238)**	**(126)**	**(321)**	**(54)**	**16,370**
Software	(2,963)	(775)	153	45	(7)	(22)	**(3,569)**
Positive fair value of commodity contracts acquired in a business combination	(191)	(25)	-	-	-	-	**(216)**
Other intangible assets	(3,103)	(528)	317	26	272	14	**(3,002)**
Accumulated amortisation and impairment	**(6,257)**	**(1,328)**	**470**	**71**	**265**	**(8)**	**(6,787)**
NET VALUE	**9,350**	**2,174**	**(1,768)**	**(55)**	**(56)**	**(62)**	**9,583**

[1] Increases in intangible assets in development are stated net of the effects of newly-commissioned assets. Intangible assets in development are detailed in note 10.6.
[2] Changes in scope essentially comprise the reclassification the assets of Infrastrutture Distribuzione Gas (IDG), owned by Edison, as assets held for sale (see note 3.2).

The gross value of other intangible assets at 31 December 2020 includes:

- the Edison brand and intangible assets related to Edison's hydropower concessions, amounting to €945 million and €489 million respectively;
- the Dalkia brand and intangible assets related to Dalkia's concession agreements in France, amounting to €141 million and €1,209 million respectively;
- the Framatome brand, Framatome's nuclear technology-related intangible assets and Framatome's customer contracts, amounting to €151 million, €777 million and €288 million respectively.

Impairment of €(85) million was recorded in respect of other intangible assets in 2020 (€(47) million in 2019).

EDF's research and development expenses recorded in the income statement total €518 million for 2020 (€523 million in 2019).

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

Accounting principles and methods

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 costs are recognised in assets against the provision recognised to cover these obligations. At the date of commissioning, these assets are measured and recorded in the same way as the corresponding provision (see note 15);
- decommissioning costs for nuclear generation installations also include last core costs (see note 15).

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 operations that are necessary for generation assets to remain in service, and are undertaken at the time of scheduled shutdowns, particularly during major inspections, 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.

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:

- nuclear generation facilities — 40 to 50 years
- wind farm and photovoltaic facilities — 20 to 25 years
- fossil-fired power plants (mainly CCGT-Combined Cycle Gas Turbine plants) — 25 to 45 years
- transmission and distribution installations (lines, substations) — 20 to 60 years
- other general plant and machinery — 10 to 20 years

The net values of property, plant and equipment used in generation and other tangible assets owned by the group are as follows:

(in millions of euros)	31/12/2019	Increases	Decreases	Translation adjustments	Changes in the scope of consolidation[1]	Other movements[2]	31/12/2020
Land and buildings	**13,797**	479	(89)	(62)	-	(34)	**14,091**
Nuclear power plants	**75,213**	3,723	(1,778)	(631)	-	802	**77,329**
Fossil-fired & hydropower plants	**18,486**	330	(341)	(185)	1	(125)	**18,166**
Other installations, plant, machinery, equipment & other	**21,316**	1,599	(559)	(812)	(1,042)	118	**20,620**
Right-of-use assets[3]	**5,355**	479	-	(48)	(21)	(32)	**5,733**
Assets in progress[4]	**34,959**	5,362	(30)	(850)	12	162	**39,616**
Gross value	**169,126**	**11,972**	**(2,797)**	**(2,588)**	**(1,050)**	**891**	**175,555**
Land and buildings	**(7,518)**	(406)	67	10	5	(1)	**(7,843)**
Nuclear power plants	**(49,345)**	(3,522)	1,696	337	-	481	**(50,353)**
Fossil-fired & hydropower plants	**(12,765)**	(1,352)	339	178	-	150	**(13,450)**
Other installations, plant, machinery, equipment & other	**(9,173)**	(1,293)	519	309	143	(41)	**(9,536)**
Right-of-use assets[3]	**(1,022)**	(697)	-	5	2	95	**(1,617)**
Assets in progress[4]	**(204)**	(40)	3	6	(7)	86	**(156)**
Depreciation and impairment	**(80,027)**	**(7,310)**	**2,624**	**845**	**143**	**770**	**(82,955)**
NET VALUE	**89,099**	**4,662**	**(173)**	**(1,743)**	**(907)**	**1,661**	**92,600**

[1] Changes in the scope of consolidation essentially relate to EDF Renewables.
[2] Other movements include the effect on assets associated with provisions and underlying assets of the €707 million change in the real discount rate used to calculate provisions related to EDF's nuclear generation (see note 15.1) and EDF Energy for €322 million (see note 15.2).
[3] Right-of-use assets are detailed in note 10.4.
[4] Increases in assets in progress are stated net of the effects of newly-commissioned assets. Assets in progress are detailed in note 10.6.

The changes observed in property, plant and equipment used in generation owned by the Group include a €(1,093) million impact of translation adjustments due to the rise of the euro against the pound sterling.

Depreciation period of coal-fired plants in France

In view of France's Energy and Climate law of 8 November 2019, the ends of the depreciation periods for the Le Havre and Cordemais coal-fired plants were changed at 1 June 2019, setting the closure of Le Havre at 1 April 2021 while Cordemais is to continue operating until 2026, considering a possible conversion to biomass as part of the Ecocombust project. The date for Cordemais could still change depending on the decisions made about the project, which is currently under review

by the public authorities. As a result of this change of dates, accelerated depreciation compared to the previous depreciation period is now recognised, amounting to €250 million in 2020 (€141 million in 2019).

10.4 RIGHT-OF-USE ASSETS

Accounting principles and methods

Under IFRS 16, applicable since 1 January 2019, a contract is, or contains, a lease if it confers the right to control the use of an identified asset for a period of time in exchange for a consideration.

Identified 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 are classified as leases by reference to IFRS 16.

Recognition of a lease contract as lessee under IFRS 16

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

IFRS 16 requires leases to be recognised in the lessee's balance sheet when the leased asset is made available, in the form of a "right-of-use" asset, presented in "Property, plant and equipment used in generation and other tangible assets owned by the Group, including right-of-use assets" with a corresponding financial liability associated with the lease commitment, presented in "Current and non-current financial liabilities".

Upon initial recognition of a lease, the right of use and the lease liability are valued by discounting the future lease payments over the term of the lease, taking into consideration assumptions regarding the renewal or termination of leases if the relevant options are reasonably certain to be exercised.

As a rule, since the implicit interest rate in a lease is difficult to determine, the lessee's incremental borrowing rate is used to discount the lease liability. This rate is based on zero-coupon EDF bond rates, adjusted for the currency risk, a country risk premium, the term of the lease contracts and the subsidiary's credit risk at the date of initial recognition of the contract. In certain cases, it is based on a subsidiary's specific incremental borrowing rate.

Subsequently, the right of use is amortised over the expected term of the lease, while the lease liability is stated at amortised cost, i.e. adding the interest recognised in the financial result, and deducting the amount of the lease payments made.

The Group applies the two exemptions allowed by IFRS 16, and as a result leases with a term of 12 months or less and leases of assets with individual value when new of less than USD 5,000 are not recognised in the balance sheet. Consequently, the payments on these leases are recognised on a straight-line basis over the lease term in the income statement.

If the Group performs a sale and leaseback operation – consisting of selling an asset to a third party and then renting it back as lessee – which is classified as a sale under IFRS 15, it measures the right-of-use asset resulting from the lease as the proportion of the asset's previous book value that corresponds to the right of use retained by the Group. Also, the gain on the sale of the asset by the Group only corresponds to the proportion of the right of use actually transferred to the third party. The lease liability is not adjusted, unless the conditions of the sale or lease do not reflect market values.

Off-balance sheet commitments presented in note 21.1.1 concern:

- Short-term leases (12 months or less);
- Leases of assets with low value (less than USD 5,000 when new);
- Leases signed for which the leased assets have not yet been made available (for example, assets under construction).

Recognition of a lease contract as lessor

The accounting treatment of a lease contract in which the Group is lessor depends on the classification of the contract. For a finance lease which transfers substantially all risks and rewards inherent to ownership of the underlying asset to the lessee, the Group recognises a financial asset in its balance sheet instead of the initial fixed asset; in this case, the receivable is equal to the discounted value of future lease payments.

10.4.1.1 Change in right-of-use assets

(in millions of euros)	31/12/2019	Increases[1]	Decreases	Changes in the scope of consolidation	Other movements[2]	31/12/2020
Land and buildings	**4,520**	283	-	(31)	(32)	**4,740**
Other installations, plant, machinery, equipment & other	**835**	196	-	10	(48)	**993**
Gross value	**5,355**	**479**	**-**	**(21)**	**(80)**	**5,733**
Land and buildings	**(541)**	(555)	-	2	39	**(1,055)**
Other installations, plant, machinery, equipment & other	**(481)**	(142)	-	-	61	**(562)**
Depreciation and impairment	**(1,022)**	**(697)**	**-**	**2**	**100**	**(1,617)**
NET VALUE	4,333	(218)	-	(19)	20	4,116

[1] *Increases concern right-of-use assets recognised in respect of new leases.*
[2] *Other movements include the effect of contract revisions on right-of-use assets and translation differences.*

10.4.1.2 Impacts in the income statement

The main impacts of recognition in the income statement of lease contracts as lessor, in accordance with IFRS 16, are as follows:

(in millions of euros)	2020	2019
Income from subleases	56	73
Variable lease expenses	(46)	(45)
Expenses on short-term leases or leases of low-value assets	(106)	(167)
Income from sale and leaseback operations	-	-
Operating profit before depreciation and amortisation	**(96)**	**(139)**
Depreciation on right-of-use assets	(697)	(660)
Operating profit	**(793)**	**(799)**
Interest expense on the lease liability	(80)	(85)
Income before taxes of consolidated companies	**(873)**	**(884)**

10.4.1.3 Payments relating to leases

(in millions of euros)	2020	2019
TOTAL PAYMENTS RELATING TO THE LEASE LIABILITY	(795)	(790)

Payments relating to the lease liability mainly concern principal repayments, and amount to €719 million in 2020 (€721 million in 2019).

10.5 PROPERTY, PLANT AND EQUIPMENT OPERATED UNDER CONCESSIONS OTHER THAN FRENCH PUBLIC ELECTRICITY DISTRIBUTION CONCESSIONS

Accounting principles and methods

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

Concessions in France

In France, the Group is the operator for three types of concessions:

- public electricity distribution concessions granted by local authorities (municipalities or syndicated municipalities) (see note 11);
- hydropower concessions granted by the State;
- heat generation and distribution concessions from public authorities.

Hydropower concessions

Hydropower concessions follow standard rules approved by decree. For concessions granted before 1999, hydropower concession assets consist solely of hydropower generation equipment (dams, pipes, turbines, etc), while for more recent concessions, they also include hydropower generation equipment and switching facilities (alternators, etc).

Most concessions that expired before 2012 were initially for 75 years and were renewed for terms of 30 to 50 years. However, the French government has not yet renewed 18 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).

As these concession agreements are not concerned by IFRIC 12 “Service concession agreements”, the assets used, whether directly owned or part of the concession, are recorded under “Property, plant and equipment operated under concessions other than French public electricity distribution concessions” at acquisition cost.

The main depreciation periods applied are:

- Hydroelectric dams 75 years
- Electromechanical equipment used in hydropower plants 50 years

Heat generation and distribution concessions from public authorities

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 concession-granting authority’s supervision.

These agreements set the terms for remuneration and transfer of the facilities to the concession-granting authority or another operator taking over at the end of the agreement.

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

Concession assets generally comprise:

- boiler houses
- networks
- network extensions
- network connections
- and sometimes cogeneration assets.

Intangible assets are depreciated on a straight-line basis over the term of the concession, which is generally between 15 and 25 years.

Almost all of these assets are located in France.

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 other than French public electricity distribution concessions”. Foreign concessions essentially concern Edison in Italy, which operates local gas distribution networks, hydropower generating plants and energy services 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 concession-granting authority 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.

The net values of property, plant and equipment operated under concessions other than French public electricity distribution concessions are as follows:

(in millions of euros)	31/12/2019	Increases	Decreases	Changes in the scope of consolidation	Other movements	31/12/2020
Land and buildings	**1,528**	137	(9)	(16)	-	**1,640**
Fossil-fired & hydropower plants	**11,021**	718	(23)	29	(34)	**11,711**
Other	**651**	36	(11)	(2)	3	**677**
Assets in progress[(1)]	**1,213**	(528)	(5)	(30)	(60)	**590**
Gross value	**14,413**	**363**	**(48)**	**(19)**	**(91)**	**14,618**
Land and buildings	**(956)**	(34)	9	1	-	**(980)**
Fossil-fired & hydropower plants	**(6,081)**	(272)	19	24	28	**(6,282)**
Other	**(458)**	(36)	11	-	1	**(482)**
Assets in progress[(1)]	**(58)**	-	-	-	42	**(16)**
Depreciation and impairment	**(7,553)**	**(342)**	**39**	**25**	**71**	**(7,760)**
NET VALUE	**6,860**	**21**	**(9)**	**6**	**(20)**	**6,858**

[(1)] Increases in assets in progress are stated net of the effects of newly-commissioned assets. Assets in progress are detailed in note 10.6.

At 31 December 2020, property, plant and equipment operated under concessions other than French public electricity distribution concessions comprise concession facilities mainly located in France and in Italy (hydropower, excluding public electricity distribution).

10.6 ASSETS IN PROGRESS

(in millions of euros)	2020	2019
Intangible assets	1,581	1,415
Property, plant and equipment used in generation and other tangible assets owned by the Group	39,460	34,755
Property, plant and equipment operated under concessions other than French public electricity distribution concessions	574	1,155
TOTAL ASSETS IN PROGRESS	**41,615**	**37,325**

Intangible assets

Intangible assets in progress include notably studies for the EPR 2 project, amounting to €577 million (€414 million at 31 December 2019).

A draft PPE published on 25 January 2019 by the Ministry for the Ecological and Inclusive Transition 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 and 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. The Group is fully mobilised in the investigation and preparation of this case in all its components, in conjunction with the public authorities.

Property, plant and equipment used in generation and other tangible assets owned by the Group

At 31 December 2020, property, plant and equipment in progress used in generation and owned by the Group mainly comprise:

- Investments for the Flamanville 3 EPR amounting to €14,565 million, including capitalised interim interest of €3,291 million at 31 December 2020 (€13,653 million at 31 December 2019, including capitalised interim interest of €3,028 million). The amount capitalised for the Flamanville 3 project in the financial statements at 31 December 2020 is €14,792 million, which also includes €208 million[1] for assets that have been commissioned, see note 10.3).

  This capitalised amount of €14,792 million including capitalised interim interest, includes, in addition to the construction cost:

  - an inventory of spare parts and capitalised amounts totalling €466 million for related projects (notably the initial comprehensive inspection and North Area development);

1 €292 million in gross value, less €84 million of depreciation.

- €691 million of pre-operating expenses and other property, plant and equipment related to the Flamanville project;
- and the elimination of internal balances on balance sheet items and margins between Framatome and EDF SA in connection with the Flamanville 3 EPR project (€277 million, essentially consisting of advances and progress payments),
- giving a construction cost at historical value of €10,318 million in the consolidated financial statements at 31 December 2020, and a construction cost at completion (excluding borrowing costs) of €12.4 billion (in 2015 euros), as announced on 9 October 2019.

In its report of July 2020 on EPR technology, the French Court of Auditors (*Cour des Comptes*) stated that by its calculations, in addition to the construction cost of €12.4 billion (in 2015 euros) announced by EDF, there will be further costs that could reach €6.7 billion (in 2015 euros), including €4.2 billion of interest expenses. As stated above, at 31 December 2020 the capitalised interest amounts to €3.3 billion and other capitalised project costs amount to €1.2 billion.

The non-recurring additional costs resulting from the necessary repairs to the main secondary circuit welds are recorded in other income and expenses at the amount of €397 million in 2020 (see note 7).

- Investments relating to Hinkley Point C, amounting to €13,586 million including capitalised interim interest of €518 million (€10,942 million at 31 December 2019 including capitalised interim interest of €318 million). In 2020 investments in this project amount to €2,868 million.
- Studies concerning Sizewell C amounting to €324 million (€219 million in 2019).

Investments in property, plant and equipment and intangible assets

Property, plant and equipment in progress increased by €4,705 million as the level of investment in 2020 was significantly higher than the amount of assets brought into service during the year (see note 10.3). Investments in property, plant and equipment and intangible assets during 2020 (see note 10.7) mainly concern:

- the France – Generation and Supply segment for €5,361 million, primarily investments made under the "*Grand Carénage*" programme, investments for Flamanville 3, and investments in hydropower generation;
- the United Kingdom segment for €3,679 million, where investments principally related to nuclear power generation;
- the EDF Renewables segment for €1,991 million, which saw a significant rise in wind and solar capacities under construction in France and North America, and in emerging countries.

Principal projects in progress and investments during the year

Grand Carénage programme

Since 2014 EDF has been implementing its "*Grand Carénage*" programme designed to enhance reactor safety and continue nuclear fleet operations beyond 40 years. The cost of this programme was estimated in 2015 at €55 billion (in 2013 euros) for the period 2014 to 2025. After optimisations and deferrals, this cost was revised in 2018 to €45 million in 2013 euros, i.e. €48.2 billion in current euros, still for the period 2014-2025.

On 29 October 2020, EDF adjusted the programme's cost to €49.4 billion in current euros from 2014 to 2025.

The new cost estimate mainly reflects the first findings on the works to be conducted in the context of the ongoing fourth periodic safety review of the Group's 900MW reactors. This review focuses on studies, modification work and initially unplanned additional equipment to improve safety levels. The estimate also factors in the revised duration of scheduled maintenance outages for ten-year and partial inspections, in response to prior year experience and the impacts of the Covid-19 pandemic for the period 2020-2022 (see note 1.4.1).

The *Grand Carénage* programme is continuing with 33 ten-year inspections conducted at the Group's 900MW, 1300MW and 1450MW reactors and 55 out of 56 emergency diesel generators commissioned.

The ASN's decision setting the requirements for 900MW reactors in the light of the conclusions of the generic phase of their fourth periodic review is expected by the end of February 2021.

Flamanville 3 EPR project

Developments in 2019

On 11 April 2019[1], EDF announced that it was aware of the opinion of the Permanent Group of experts for nuclear pressure equipment (GP ESPN), made public on 11 April 2019, regarding the quality deviations affecting the welds located on the main steam transfer pipes covered by the break preclusion principle[2] at the Flamanville EPR.

The Nuclear Safety Authority (ASN) had held a meeting of the GP ESPN on 9 April 2019 as part of its investigation into these quality deviations:

- On 3 December 2018, EDF submitted a technical file to the ASN presenting the procedures for repairing and upgrading the main secondary circuit welds, which had shown deficiencies with respect to the break preclusion requirements, as well as for the specific justification method for the 8 welds located in the reactor containment building structure;
- The file was examined by the ASN, with technical support from the Institute for Radiation Protection and Nuclear Safety (IRSN);
- Based on this examination, discussions took place at a GP ESPN meeting attended by EDF, which presented the background facts, their analysis and the methods for dealing with the issue. EDF answered all the Permanent Group of experts' questions for the technical examination of this file.

EDF indicated at the time that the recommendations and solution avenues suggested by the Permanent Group of experts could have an impact on the commissioning schedule and construction cost, and that the Group would continue its discussions with the ASN, which was to issue its decision regarding action to be taken on this matter a few weeks later.

Consequently, the Group stated that a detailed update of the schedule and construction cost for the Flamanville EPR would be given after the ASN's decision had been published.

On 20 June 2019[3], EDF announced that it was aware of the decision issued by the ASN in its letter of 19 June 2019 regarding the quality deviations affecting the welds located on the main steam transfer pipes covered by the break preclusion principle at the Flamanville EPR.

In that letter, the ASN asked EDF to repair the eight containment penetration welds at the Flamanville EPR that were not compliant with the break preclusion principle.

On 26 July 2019[4], EDF announced that three scenarios for upgrading the penetration welds were under consideration, and that after a detailed examination of the three scenarios and discussions with the ASN, the Group would communicate the schedule and cost implications of the selected scenario in the next few months. The Group also stated that commissioning could not be expected before the end of 2022.

This work then resulted in discussions with the ASN, which sent EDF[5] a letter on 4 October 2019 concerning the technical feasibility of these three scenarios.

The penetration weld repair scenario presented as preferred by EDF involves the use of remote-operated robots, designed to conduct high-precision operations inside the piping concerned, a technology developed for nuclear power plants in operation that must be qualified for penetration weld repairs. The aim is to have this scenario qualified and validated by the ASN by the end of 2020, at which date EDF will be able to initiate the repair work. A second scenario involving extraction and realignment work in the Safeguard Auxiliary Buildings is held at this stage as a fall-back solution.

Based on this penetration weld repair strategy, the EDF Board of Directors approved continuation of the Flamanville EPR construction at a meeting held on 8 October 2019.

This led the Group to adjust the schedule and the estimated construction cost for the Flamanville[6] EPR.

The provisional schedule for implementation of the preferred penetration weld repair scenario, if the objective of ASN validation is achieved, sets the date of fuel loading in late 2022 and the revised construction cost at €12.4 billion[7], an increase of €1.5 billion. Most of these additional costs will be treated as operating expenses[8], rather than being capitalised and will affect the financial years 2020, 2021 and 2022.

1 *Cf. press release of 11 April 2019.*

2 *The break preclusion principle is a very high standard of quality with stricter requirements than nuclear pressure equipment regulations for the design, manufacturing and in-service monitoring of certain items of equipment. These stricter requirements must be sufficient to consider that rupture of this equipment is highly unlikely. When this standard is applied, a comprehensive study of the consequences of breaks in this piping is not required in the plant safety case.*

3 *Cf. press release of 20 June 2019.*

4 *Cf. press release of 26 July 2019.*

5 *Cf. press release of 9 October 2019.*

6 *The issue of deviation from the technical manufacturing standards for Framatome reactor components (stress-relieving heat treatment process for the welds with electrical resistance) concerns the four steam generators and pressuriser at Flamanville 3 EPR - see press release of 9 September 2019.*

7 *In 2015 Euros, excluding interim interest.*

8 *IAS 16.22 concerning abnormal costs incurred in connection with self-constructed assets.*

Developments in 2020

The main developments at the Flamanville site in 2020 were the following:

The second hot functional test phase started on 21 September 2019 was completed on February 2020. Hot functional testing checks plant performance under simulated normal operating conditions.

In the context of the Covid-19 pandemic, after a cluster of cases was identified in the Manche area, work on the Flamanville site was restricted from mid-March to safety, security and environment monitoring work only (see note 1.4.1). General activity on the site resumed progressively from 4 May 2020 and was back to near-normal levels in July 2020.

Functional tests of the open reactor vessel were successfully completed between 21 May and 25 June 2020.

Following the ASN's decision of 8 October authorising partial commissioning of the EPR, the first fuel assemblies arrived at the site on 26 October and are stored in the reactor building pool.

In parallel, the upgrading work continued on non-penetration welds on the main secondary circuit that had quality deviations or did not meet the break preclusion requirements defined by EDF, and several welds were repaired in August 2020 once the ASN issued its first authorisations. EDF also decided to include the welds on the circuit supplying water to the steam generators in the scope of the repairs concerning the main secondary circuit. Qualification of the repair procedure for these welds is currently in process, with the objective of performing the work in the second half of 2021. At this stage, the repairs concern a hundred welds in the secondary circuits.

A review was conducted in 2020 of the impact of France's first national lockdown on the Flamanville project. This did not lead to any change to the fuel loading dates or the construction cost announced in October 2019, but it showed that the project has no remaining margin in its schedule or cost. However, achievement of the targets depends on a number of factors, notably the ASN's examinations of EDF's proposed methods for repairing the main secondary circuit welds, particularly the qualification of welding robots for repairing the penetration welds.

Work on these repairs cannot begin until the ASN makes its final decision as to approval of the entire process involving remote-controlled robots, which has been deferred to the first quarter of 2021. This phase of the project is among those in the critical path for on-schedule finalisation of the EPR. A further review of the project will be conducted in 2021.

Hinkley Point C

Despite being affected by the Covid-19 health crisis (see note 1.4.1), progress continued on the Hinkley Point C project in 2020 as regards work on site, the design execution plans and the manufacturing of equipment. The project reached 4 milestones set for 2020:

- installation of the first safety pipes on the unit 1 nuclear island;
- completion of the raft for the unit 2 nuclear island (milestone J0) in line with the initial schedule of 2016;
- production of the feed water tank for unit 1;
- completion of the internal structure design for unit 1 reactor building.

Other advances were made on Unit 1, particularly completion of the 3.5km cooling water tunnel and installation of the first liner ring in the reactor building. Significant progress was also made on Unit 2, which is following Unit 1 with a 12-month time lag.

A detailed review of schedule and cost was performed in 2020, particularly to estimate the impact of the pandemic so far. The conclusions of this review were made public on 27 January 2021 and are as follows[1]:

- The start of electricity generation from Unit 1 is now expected in June 2026, compared to end-2025 as initially announced in 2016.
- The project completion costs are now estimated in the range of £$_{2015}$22 to 23bn[2]. As a consequence, the projected rate of return (IRR) for EDF is estimated between 7.1% and 7.2%[3].
- The risk of a COD delay for Units 1 and 2 is maintained at 15 and 9 months respectively . The realisation of this risk, which has a high probability, would incur generate a potential additional cost in the order of £$_{2015}$0.7bn, which would reduce the IRR for EDF by 0.3%.

The management of Hinkley Point C have set the objective of putting the dome of Unit 1 in place by the end of 2022.

1 *Cf. press release of 27 January 2021. The information assumes the ability to begin a ramp up back to normal site conditions from the second quarter of 2021.*

2 *The costs previously announced in the press release of 25 September 2019 were £2015 21.5 – 22.5bn. Costs net of operational action plans, in 2015 sterling, excluding interim interest and excluding forex effect versus the reference exchange rate for the project of 1 sterling = 1.23 euro. Costs are calculated by deflating estimated costs in nominal terms using the British Construction OPI for All New Work index.*

3 *EDF equity IRR calculated at the exchange rate of 1 sterling = 1.13 euro and including the capped compensation mechanism in place between the project's shareholders. Previous IRR of 7.6% - 7.8% was based on an exchange rate of £1 = €1.15.*

Sizewell C

Alongside the HPC contracts signed by EDF and CGN in September 2016, agreements were also signed for the Sizewell C project in Suffolk in England, covering the development, construction and operation of two EPR units with total capacity of 3.2GW.

During the development phase prior to the final investment decision, EDF's share is 80% and CGN's share is 20%. The final investment decision could be made in mid-2022. The underlying assumption is that the majority of the project will be owned by non-Group investors, and EDF expects to become a minority shareholder with correspondingly limited rights at the time of the financial investment decision, at which point it will deconsolidate the project. The ability to make a final investment decision regarding Sizewell C will depend largely on definition of a regulatory framework and an appropriate funding model of a kind never yet implemented for a project of this scale in Europe. It is not currently certain that this will be achieved.

Development of this project is founded on a strategy of replication of the HPC project, which focuses on reducing construction costs, by lowering expenses through reducing risks. Sizewell C will therefore use EPR technology (with EDF as "Responsible designer") and should benefit from feedback from HPC.

On 24 June 2020, the UK's Planning Inspectorate formally accepted the Sizewell C planning application for examination. Examination of the application should begin in April 2021, which means that the Secretary of State should make a decision about planning permission by April 2022.

Another important milestone was reached on 30 June 2020 when Sizewell C applied to the Office for Nuclear Regulation (ONR) for a nuclear site licence to construct and operate the new power station.

After publication of the Energy White Paper on 14 December 2020, the British government officially declared that it was to start discussions on the Sizewell C project to consider the possible options. It said it would continue to explore several funding options for new nuclear operations, including the regulated asset base (RAB) funding model. Given the scale of the financing challenge, the government will also consider the possibility of public financing during construction, "provided there is clear value for money for consumers and taxpayers".

10.7 INVESTMENTS IN INTANGIBLE ASSETS AND PROPERTY, PLANT AND EQUIPMENT

The table below provides a breakdown of the investments in intangible assets and property, plant and equipment presented in the cash flow statement:

(in millions of euros)	2020	2019[1]
Acquisitions of intangible assets	(1,446)	(1,380)
Acquisitions of property, plant and equipment	(15,086)	(15,514)
Change in payables to suppliers of fixed assets	525	97
INVESTMENTS IN INTANGIBLE ASSETS AND PROPERTY, PLANT AND EQUIPMENT	**(16,007)**	**(16,797)**

[1]Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).

10.8 IMPAIRMENT/REVERSALS

Accounting principles and methods

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 (thermal generation, renewable energy production, services), or single assets;
- 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; impairment booked on goodwill is irreversible.

- 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 closing 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, within the framework of a scriptwriting process 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, Wood Mackenzie or Aurora, 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 revenue 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.

10.8.1 Impairment by category of asset

Details of impairment recognised and reversed are as follows:

(in millions of euros)	Notes	2020	2019[1]
Impairment of goodwill	10.1	(31)	(57)
Impairment of other intangible assets	10.2	(85)	(47)
Impairment of tangible assets	10.3-10.5	(683)	(299)
IMPAIRMENT NET OF REVERSALS		**(799)**	**(403)**

[1]Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).

Impairment recognised at 31 December 2019 amounted to €(403) million and concerned:

- thermal assets in the United Kingdom (€127 million);
- various CGUs of Dalkia, particularly in Poland (€105 million);
- various CGUs of EDF Renewables, notably goodwill impairment for a German entity (€49 million);
- hydropower assets (€33 million) and energy service assets (€27 million) owned by Edison in Italy;
- and other assets (total €62 million), including €24 million of projects stopped in France.

Impairment of €73 million was also booked at 31 December 2019 in respect of associates (see note 12).

Impairment recognised in 2020 amounts to €799 million. Details are given below.

10.8.2 Impairment test 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 2020, and some of the key assumptions used.

For application of IFRS 16 at 1 January 2019, where relevant the Group adapted the impairment test methodology as appropriate to the specific features of each CGU.

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 2020 *(in millions of euros)*
United Kingdom	EDF Energy goodwill	7,569	6.0%	-[1]	-
Italy	Edison brand	945	6.5%	2.0%	-
Framatome	Framatome goodwill	1,332	6.1%	0.5%	-
	Framatome brand	151	6.1%	0.5%	-
Dalkia	Dalkia goodwill	547	4.3%	1.4%	-
	Goodwill of DES Groom an engineering subsidiary in the US)[2]	26	6.1%	1.5%	**(26)**
	Dalkia brand	141	4.3%	1.4%	-
Other impairment					**(5)**
IMPAIRMENT OF GOODWILL AND INTANGIBLE ASSETS WITH INDEFINITE USEFUL LIVES					**(31)**

[1] *The impairment test of EDF Energy goodwill covers the useful life of industrial assets, with no projection to infinity.*
[2] *Impairment booked at 30 June 2020.*

Impairment of other intangible assets and property, plant and equipment

Operating segment	Cash-Generating Unit or asset	Impairment indicators	WACC after tax	Impairment 2020 *(in millions of euros)*
United Kingdom	Nuclear assets [1]	Decrease in market prices and early shutdowns of certain AGR units / lower production forecasts	6.0%	**(621)**
	Gas storage assets	Regulatory investments in certain fully-depreciated plants	5.4%	**(13)**
Italy	Hydropower assets [1]	Unfavourable change in regulations on hydropower concessions	6.5%	**(39)**
	Energy services [1]	Lower profitability on certain contracts	6.5%	**(27)**
EDF Renewables	Some CGUs	Unfavourable tariff prospects	3.4% - 6.6%	**(36)**
Other impairment				**(32)**
IMPAIRMENT OF OTHER INTANGIBLE ASSETS AND PROPERTY, PLANT AND EQUIPMENT				**(768)**

[1] *Impairment mainly booked at 30 June 2020*

General assumptions

In view of the specific context resulting from the Covid-19 pandemic, at the half-year 2020 closing a specific approach was adopted to take account of macro-economic conditions (discount rates), changes in market prices for commodities and electricity, the initial orientations resulting from adjustment of the Medium-Term Plan, and the specific situation of certain Group entities. This led to recognition of a total €738 million of impairment at 30 June 2020.

At 31 December 2020, the Group applied its usual method for impairment testing, updating the annual tests for goodwill and intangible assets, including those tested at 30 June 2020.

Electricity prices

Over the market horizon, the forward prices used in the impairment tests are the market prices observed at the year-end, which were substantially lower than at the 2019 year-end.

Over the long-term horizon, these tests consider price curves constructed analytically by assembling blocks of assumptions and fundamental models of the supply-demand balance, in an annually updated scenario-building process.

The long-term price curves in the 2020 scenario are lower at the start of the horizon (2024-2030) than in the 2019 scenario, with a loss of value in non-peak electricity supplies in the four principal countries (France, the UK, Italy and Belgium), as anticipated in the interim tests conducted at 30 June 2020. They are then higher than in the 2019 scenario in most countries over the following period (2030-2040). There are several explanatory factors for this pattern:

- The long-term price of fossil commodities, especially gas prices in Europe, declined between the two scenarios due to an upward adjustment to assumptions of LNG supply (as many new LNG plant projects have been announced in several parts of the world), plentiful resources at durably low prices in the United States (non-conventional gas and associated gas), and falling demand in Europe over the whole horizon reflecting the effect of energy efficiency policies and the expansion of renewable energies;
- Meanwhile, the price trajectory of CO_2 quotas in the ETS (EU Emissions Trading System) was adjusted upwards in view of the European Union's plans for tougher commitments to achieve a substantial reduction in greenhouse gas emissions, particularly concerning targets for the years 2030 and 2050;
- Updated assumptions regarding supply and demand for electricity, showing a downturn in demand for electricity in the medium term (due to higher energy efficiency, and to a lesser extent lower prices for gas supplied in Europe). This trend self-corrects over the longer term, with demand rising in line with the growth in electric vehicles and electrolytic hydrogen.

As these assumptions are crucial in determining recoverable value, sensitivity analyses are conducted on long-term price curves when impairment tests are carried out. The information disclosed about the sensitivity of recoverable value to electricity prices remains appropriate in the current context: the effects of the Covid-19 pandemic are expected to be limited after 2025, and reference is made to forward prices that capture the effects on short-term growth.

Regarding the assumptions concerning capacity mechanisms, capacity revenue is expected to be slightly higher than in the 2019 scenario in most European countries, due to the downward revision of the return on the most recent generation assets on the electricity sales market, particularly in connection with upward revision of CO_2 prices. This structural trend also concerns France, but with a time lapse. With the new capacities set to arrive in France between now and 2025 (particularly the Flamanville EPR, the Landivisiau CCG plant, and France's first offshore wind farm), the French electricity system will regain some room for manoeuvre, and this will bring capacity prices down.

Discount rates

The discount rates used in these tests are higher than at 31 December 2019 for most core European countries, to reflect EDF's broader financing spread combined with an increase in the market risk premium. However, the increase is more moderate than at 30 June 2020, due to revision of the financing spread and to take account of the lower risk-free rates. In the United Kingdom, the change in the income tax rate leads to a stability of the discount rate compared to 31 December 2019. In Italy, the sovereign risk premium was raised at 30 June 2020 due to the specific national context, and remains higher at the year-end than in 2019 because of volatility, resulting in a more pronounced increase in WACC. The year-on-year increase in the principal WACC rates used in the tests is around 10 to 20bp for France and Belgium and 40bp for Italy. The test results have been subjected to analyses of their sensitivity to the discount rate.

At 31 December 2020, the great majority of the Group's assets are impacted by the macro-economic context presented earlier. The possible consequences in terms of impairment were already broadly identified for the half-year closing at 30 June 2020.

United Kingdom – EDF Energy

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. The necessary investments for the Hole House and Hill Top gas storage site were totally written off at 31 December 2019, for a cost of €(13) million. Regarding coal-fired facilities, closure of the West Burton A plant is still expected in the short term.

For the West Burton B CCGT plant, the updated impairment test benefited from a more favourable estimation of spark spreads over the entire horizon than at the end of 2019. Nonetheless, given the past impairment booked on this asset since it began operation in 2013, the headroom calculated by the 2020 year-end impairment test did not lead to any reversal of impairment. The value of West Burton B is indeed sensitive to price variations, thus a 5% change in spark spreads would have an impact of approximately 5% on its recoverable value.

Sales and Supply segment

Long-term margin assumptions were revised downwards in view of the Covid-19 pandemic, particularly for the BtoB segment, as the margins defined for the BtoC segment already reflected the competitive and regulatory situation on the British market, particularly the end of the cap on the Standard Variable Tariff in 2023. The impairment test was updated based on these revised assumptions, and showed a recoverable value that had decreased by some 40% compared to 31 December 2019 and 20% compared to 30 June 2020, but remained higher than the book value tested. Sensitivity analyses were conducted with larger reductions in long-term margins and losses of market share, and indicated no risk of loss of value. The values of the assets contained in this CGU are non-material.

Nuclear assets (plants in operation)

The recoverable value of existing nuclear assets (8 reactors: 7 Advanced Gas-cooled Reactors (AGRs) and one Pressurised Water Reactor (PWR)) is determined by discounting future cash flows over the assets' useful life, assuming a 20-year extension for the Sizewell B PWR plant, in line with Group strategy. The updated impairment test for the 2020 year-end incorporates the early shutdown decisions concerning Hunterston, to be closed no later than 7 January 2022, and Hinkley Point B, to be closed in July 2022. These decisions were announced by the Group on 27 August 2020 and 19 November 2020 respectively.

The test conducted at 30 June 2020 included lower nuclear output estimates for 2021 and 2022, intended to capture recent difficulties affecting generation and the risk of unscheduled outages and delays in bringing reactors back online during those two years. The updated nuclear output assumptions combined with the impact of declining electricity prices, in both the medium term and the long term, led to recognition of impairment of £552 million, or €621 million.

The updated impairment test at 31 December 2020 incorporates the early shutdown decisions concerning the Hunterston and Hinkley Point B plants. Following the test results, the impairment recorded at 30 June is maintained.

The recoverable value of nuclear assets is sensitive to price assumptions: a +/-2% difference over the entire horizon of the scenario used for the impairment test at 31 December 2020 would have an impact of+/-£260 million. The nuclear output assumptions used also have a notable influence on the calculation: a +/-3% revision to prospects over the entire horizon would result in a variation of +/-£400 million in the recoverable value. In addition, a 50bp increase in the discount rate would lead to additional impairment of around £300 million.

Goodwill

EDF Energy's goodwill amounted to €7.6 billion (or £6.7 billion) at 31 December 2020 and mainly results from the takeover of British Energy in 2009.

The recoverable value of EDF Energy is determined by discounting future cash flows over the assets' useful life, taking into consideration the two EPRs with a 60-year useful life currently under construction at the Hinkley Point site, a project for which the final contracts were signed on 29 September 2016. Future cash flows from 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 CfD exercise price for HPC is set at £$_{2012}$92.50/MWh and is indexed on UK inflation via the consumer price index (CPI). Thus, for the operation period under a CfD, future cash flows include a long-term inflation assumption. For the 25 years of operation after the CfD period, for which no forecasts exist for long-term UK electricity market prices, future cash flows include a very long-term inflation assumption to determine electricity market prices, starting from the final year of cash flows valued on the basis of the CfD.

The impairment test at 31 December 2020 incorporates the latest estimates of the Hinkley Point C (HPC) project costs announced on 27 January 2021, 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 an estimated £22-23 billion (in 2015 sterling), instead of the estimate of £21.5-22.5 billion (in 2015 sterling) from the previous cost revision of September 2019, and deferral of the delivery of reactor 1 to mid-2026. The range will depend on the effectiveness of action plans to be delivered in partnership with contractors, as the impairment test results lie in the middle of the range. The additional costs result from the detailed review of the costs and schedule, taking account of the impacts of the Covid-19 pandemic as currently assessed. EDF's projected rate of return (IRR) is now estimated at between 7.1% and 7.2% (compared to 7.6%-7.8% in the previous review).

On this revised basis and in view of the unfavourable effects on the recoverable value of existing nuclear assets and the sales and supply segment explained above, there is still significant headroom between the recoverable value and the book value of EDF Energy at 31 December 2020. Sensitivity analyses on the WACC show that a 50bp increase in WACC would not result in a risk of impairment.

For HPC, the latest project review on 27 January 2021 confirmed the risk of deferral of the Commercial Operation Date (COD), estimated at 15 months for Unit 1 and 9 months for Unit 2, entailing a potential additional cost of around £0.7 billion (in 2015 sterling) which would reduce the IRR for EDF by around 0.3%. This risk of deferral and the associated additional cost would reduce the impairment headroom resulting from the EDF Energy test by approximately 30%.

Sensitivity analyses were also conducted for information purposes using extremely pessimistic assumptions: for example, it was estimated that a further 3-year deferral of the COD and an associated additional cost of £3 billion would lead to a threshold value for the goodwill impairment headroom, all other things being equal.

Additional sensitivity analyses were conducted on the long-term inflation assumptions adopted for HPC revenue over the term of the CfD and beyond. They did not show any risk of impairment, all other things being equal.

Finally, although Brexit has no immediate impact on impairment tests of EDF Energy's assets since most cash flows (income, costs, investments) and assets are stated in pounds sterling, the longer-term consequences are still hard to predict. 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 impairment test of the Edison brand, first recognised at the value of €945 million when Edison was taken over in 2012, is updated annually using the royalty relief method and a 100bp risk premium for determining the discount rate. In view of the macro-economic situation at 30 June 2020, the test was updated and indicated a loss of recoverable value, essentially due to the higher WACC, without leading to recognition of impairment. This test was updated at 31 December 2020 under the usual approach, and the results confirmed the absence of impairment. An external assessment of the Edison brand value performed in 2020 has also concluded that the value in use is higher than its net book value. However, sensitivity analyses show a risk of loss of value of about €55 million in the event of a 50bp increase in the WACC.

Concerning hydropower assets, the impairment test was updated at 30 June 2020, incorporating lower forward prices and the rise in WACC in Italy, and this led to recognition of impairment of €(39) million. The updated test at 31 December 2020 has not identified any additional risk. A 50bp increase in the WACC would lead to recognition of around €(15) million of additional impairment. A 5% decrease in prices over the entire horizon would have a similar result.

In energy services, impairment of €(27) million, including €(23) millions at 30 June 2020, was recorded on the Edison Facility Solution assets at 30 June 2020, mainly as a result of lower profitability prospects on certain contracts.

The decline in the recoverable value of wind power assets observed at 30 June 2020, principally due to revised price scenarios, was confirmed at the year-end and amounts to around 10% compared to 31 December 2019, although there is

still a significant headroom. These test conclusions were not affected by analyses of sensitivity to the WACC (a 50bp increase) and price variations (a 5% decrease).

Thermal assets benefit from high-return investments due to construction of the new-generation CCGTs at Marghera and Presenzano which have respective capacities of 780MW and 760MW and low environmental impact (carbon emissions are 40% below the national average, and NOx emissions are reduced by 70%) and should begin generating energy in 2022 and 2023 respectively. Sensitivity analyses were conducted on these assets, and the results show that a 10% decrease in clean spark spreads or a 50 base point increase in WACC would not entail any risk of impairment.

Finally, the Algerian E&P assets presented as continuing operations were subjected to an impairment test at 31 December 2020, particularly in view of the situation of commodity prices on the market. The value resulting from the test did not lead to recognition of any additional impairment.

Framatome

At 31 December 2020, the goodwill of Framatome amounted to €1,332 million, resulting from EDF's acquisition of 75.5% of the capital of Framatome on 31 December 2017. The Group finalised recognition of the business combination in its financial statements at 31 December 2018.

The recoverable value of Framatome was determined on the basis of a 10-year business plan and a terminal value. This business plan is sensitive to assumptions concerning the completion of major construction projects that are incorporated into the reactor scenario, and market share assumptions for services to the installed base and fuel deliveries to customers' reactors. The WACC applied in discounting future cash flows is weighted to reflect Framatome's different businesses depending on their risk profile. The headroom indicated by the impairment test remains very significant, but the updated test at 31 December 2020 shows a lower recoverable value than at 31 December 2019, principally due to the higher WACC.

Sensitivity analyses were conducted using a 50bp increase in WACC and a 0% growth rate to infinity. The test conclusions were not affected.

Framatome's intangible assets recognised after its acquisition (technologies, including the EPR, which are depreciated over an average 15 to 20 years; customer relations amortised over an average period of 11 years; and the brand) were tested and no risk of impairment was identified.

EDF Renewables

EDF Renewables' assets mainly consist of CGUs benefiting from Price Purchase Agreements (PPAs) providing contractually defined revenues over most of the assets' useful lives, and consequently have low market risk exposure.

During 2020, impairment of €(36) million was recognised in respect of various CGUs of EDF Renewables. This amount includes €(21) million of impairment concerning a wind farm in the United States that is in the process of being sold, for a price expected to be lower than the value of the assets. The rest concerns specific assets.

Besides the French Finance Law for 2021, published in the *Journal officiel* on 30 December 2020, introduces a reduction in purchase tariffs for solar power supplied under certain contracts signed between 2006 and 2010. EDF Renewables is the exclusive or joint owner of solar power plants concerned by this potential tariff revision, with total capacity of 145MW. The modalities for application of these measures will be set out in a Council of State decree to be issued after the CRE has given its opinion. This publication date of this decree is yet unknown and in the meantime no risk of impairment can currently be estimated.

Dalkia

At 31 December 2020, Dalkia's goodwill amounts to €547 million, principally resulting 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. The impairment test conducted at 30 June 2020 showed a decrease in the recoverable value attributable to the macro-economic situation. The updated test at 31 December 2020 benefited from improvements in certain parameters since 30 June 2020, particularly the discount rate, but also the favourable impact of lower generation taxes introduced in France's economic recovery plan. Under the revised assumptions, the recoverable value of Dalkia is nearly back to its level at 31 December 2019 and remains very much higher than its value to be tested. The key parameters of the test are the terminal value, and the discount rate: both were subjected to sensitivity analyses and the results did not contradict the headroom between the book value and recoverable value.

The Dalkia brand, which was recognised as an asset when the Group took control of Dalkia in 2014 at the value of €141 million, is estimated by the royalty relief method. The updated impairment test at 31 December 2020 supports its current book value.

In view of the impacts of the Covid-19 pandemic on engineering subsidiaries, tests of specific assets were conducted at 30 June 2020, leading to recognition of €(26) million of impairment on the goodwill booked following acquisition of a subsidiary in the United States. A test was also conducted on the subsidiary Imtech in the United Kingdom in view of the substantial losses of that CGU in 2020, but did not indicate any loss of value. Threshold value analyses were conducted to verify the robustness of this result with respect to the parameters applied.

France – Generation and Supply

Due to 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, the Group considers 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 the "yellow" and "green" regulated tariffs were discontinued 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 the accounting policies, over the assets' useful life, using an after-tax WACC of 5.2% at 31 December 2020. For nuclear assets currently in operation, the Group's benchmark model assumes that the useful life is 50 years, in line with its industrial strategy. It also incorporates the proposals for early shutdown of two 900MW nuclear reactors, as set out in France's multi-year energy plan.

The impairment test takes into consideration the latest forecasts concerning Flamanville 3 dating from late 2019, which adjusted the project schedule, setting the fuel loading date in late 2022, and revised the estimated construction cost to €12.4 billion in euros$_{2015}$, excluding borrowing costs, an increase of €1.5 billion from the previous estimate mainly caused by exceptional additional costs for repairing penetration welds. The test assumes that these unusual costs will be included in other operating income and expenses rather than being capitalised.

The year-end impairment test, like the test at 30 June 2020, indicates that the recoverable value is lower than at 31 December 2019, but the headroom over the book value remains significant. As well as the unfavourable macro-economic environment (long-term and medium-term price scenarios, WACC), calculation of the recoverable value notably includes revised assumptions for electricity output and the higher cost of the *Grand Carénage* programme (particularly as a result of the Covid-19 pandemic), in line with Group announcements, and conversely the favourable effects of the national recovery plan on generation taxes.

The key assumptions in the test still concern the useful life of nuclear assets, the long-term price scenario, the discount rate, changes in costs and investments, and the capacity revenue. Each of these assumptions was subjected to sensitivity analyses and the results did not call into question the existence of a positive difference between the book value and recoverable value.

Other International – Belgium

The updated impairment test at the year-end showed that the recoverable value is higher than the book value. The loss of value indicated at 30 June based on electricity price scenarios and a projected decline in the customer portfolio was counterbalanced by an improvement in wind power asset value due to expanded capacities.

For tests of the nuclear plants operated by the ENGIE Group in which Luminus owns a 10.2% share (419MW), it has historically been assumed that operations will continue until 2025 at the latest depending on the plants.

Sensitivity analyses are conducted to incorporate the risk that the hydropower concessions may be shortened, and no associated risk of impairment has been identified.

Finally, impairment of €(189) million was recognised in respect of associates at 31 December 2020, concerning coal-fired plants in China, Framatome's investments in entities operating in sectors greatly impacted by the Covid-19 pandemic, and certain unlisted assets owned by EDF SA (EDF Invest) included in dedicated assets (see note 15.1.2).

NOTE 11 FRENCH PUBLIC ELECTRICITY DISTRIBUTION CONCESSIONS

Accounting principles and methods

The accounting treatment of public distribution electricity concessions in France is determined by the concession agreements, with particular reference to their special clauses. It takes into consideration the possibility that the EDF group, particularly Enedis, may one day lose its status as the sole authorised State concession operator.

In application of the concession agreements, the concession operator manages the facilities at its own risk for the entire term of the concession, and bears substantially all the risks and benefits (both technical and economic) over the useful life of the network infrastructure. Under IAS 16, the assets are controlled by the operator and the grantors have no decisive characteristics of control over the infrastructures as defined by IFRIC 12.

All concession assets are consequently carried in the balance sheet, regardless of their origin (facilities constructed or purchased by the concession operators, and facilities provided by the concession grantors) and the source of financing, while the contractual obligations to the grantor are recognised in the liabilities.

Public electricity distribution facilities that are constructed or purchased by the concession operator are carried at production or acquisition cost:

- purchased facilities are initially recognised at real acquisition cost including directly attributable expenses incurred to make the asset ready for use:
- the production cost of facilities developed in-house includes all labour and materials costs, and all other production costs attributable to the construction of the asset, whether incurred directly by the company or invoiced by third parties.

New facilities provided by the concession grantors are carried at the value of the cost the company would have borne if it had constructed them itself.

In the specific case of rising mains transferred for no consideration to the public distribution network in application of article 176 of French law 2018-1021 of 2 November 2018 on housing, development and digital affairs (the “ELAN” law), these assets are carried at their market value under article 213 of France’s national chart of accounts.

Balance sheet liabilities are recognised in respect of new facilities provided for no consideration by the concession grantors and the rising mains transferred under the ELAN law.

Distribution assets (pipes, substations) are depreciated over periods of 30 to 60 years, meters and metering equipment over periods of 20 to 30 years. The Group regularly checks the relevance of the main accounting parameters for concession assets (depreciation periods, replacement values, management levels).

Regulations governing distribution concessions in France

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

SEI is the concession operator for distribution network zones that are not interconnected with the network in mainland France, under identical concession regulations to Enedis.

Electricité de Strasbourg is the concession operator for public distribution networks in a limited zone depending on a non-nationalised distributor, in application of the Law of 8 April 1946.

In accordance with France’s Energy Code and Local Authorities Code, the public distribution of electricity is principally operated under the public service concessions system. The authorities granting the concessions (local authorities or public establishments for cooperation acting as an Energy Distribution Organisation Authority (Autorité Organisatrice de la Distribution d’Energie - AODE) organise the public electricity distribution service through concession agreements with specifications that define the respective rights and obligations of the parties. Enedis distributes electricity to 95% of the population of mainland France under such concessions, with 421 concession agreements at 31 December 2020. The other 5% are served by Local Distribution Companies (including Electricité de Strasbourg).

Concession agreement models

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

1992 concession agreement model

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

2017 concession agreement model

On 21 December 2017, the FNCCR, France Urbaine, EDF and Enedis signed a framework agreement for a new concession agreement model. This new model modernises the relationship between Enedis and concession-granting authorities 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 concession-granting authorities, 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 concession-granting authority's rights in the concession assets remain in the accounts. Like earlier concession agreements signed since 2011, the contractual obligation to establish provisions for replacement no longer exists, and the governance of investments is different.

To provide an effective public service, the distribution network operator and the concession-granting authority 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 (*programmes pluriannuels d'investissements* - 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.

PPIs are revised when necessary, after consulting with Enedis and the authority granting the concession, to take account of changes in each party's investment priorities and financial resources.

If it were observed at the end of a PPI that any investment concerned by Enedis' financial commitment had not been made, the concession-granting authority could oblige 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.

In accordance with the agreement reached in late 2017 with the FNCCR and France Urbaine, negotiations for concession renewals continued in the regions of France during 2020. By the end of the year, 240 concession agreements had been concluded under the new model validated in December 2017, for local projects with major cities, urban boroughs, syndicated counties or municipalities, and towns or villages. More than two thirds of concession agreements with major cities and urban boroughs have already been renewed under the new model, in addition to the 42 previously renewed or amended concessions that contain stipulations similar to the new model. The aim is to continue negotiations with the concession-granting authorities with a view to ensuring that almost all concessions using the old agreement model are renewed by the end of 2021.

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

(in millions of euros)	31/12/2019	Increases[1]	Decreases	Other movements[2]	31/12/2020
Land and buildings	**3,061**	177	(18)	(1)	**3,219**
Networks	**96,970**	4,383	(465)	11	**100,899**
Other installations, plant, machinery, equipment & other	**4,624**	466	(218)	-	**4,872**
Assets in progress[3]	**1,880**	(56)	(1)	5	**1,828**
Gross value	**106,535**	**4,970**	**(702)**	**15**	**110,818**
Land and buildings	**(1,523)**	(74)	15	(10)	**(1,592)**
Networks	**(43,724)**	(234)	361	(2,276)	**(45,873)**
Other installations, plant, machinery, equipment & other	**(2,875)**	(210)	204	(120)	**(3,001)**
Depreciation and impairment	**(48,122)**	**(518)**	**580**	**(2,406)**	**(50,466)**
NET VALUE	58,413	4,452	(122)	(2,391)	60,352

[1]Increases also include facilities provided by the concession-granting authorities. In 2020 they include €399 million resulting from incorporation of the rising mains in application of the ELAN law.
[2]Other movements mainly concern depreciation of assets operated under concessions, booked against amortization recorded in the special concession liability accounts.
[3]Increases in assets in progress are stated net of the effects of newly-commissioned assets.

11.2 SPECIAL FRENCH PUBLIC ELECTRICITY DISTRIBUTION CONCESSION LIABILITIES

Accounting principles and methods

Concession liabilities represent the contractual obligations specific to the concession rules for public electricity distribution concessions in France, and comprise the following:

- the concession-granting authority's rights in existing assets (its right to recover all the concession assets), consisting of the value in kind of the facilities (the net book value of assets operated under concessions), less any as yet unamortised financing provided by the operator;
- the concession-granting authority's rights in assets to be replaced (the operator's obligations relating to assets due for replacement):
  - Amortisation of financing by the grantor: this is a liability owed by the concession operator to the grantor and is recognised progressively as the asset is used;
  - Provision for replacement: this provision exclusively concerns assets due for replacement before the end of concessions using the 1992 concession agreement model, except for the rising mains transferred in application of the ELAN law. It is accrued over the asset's useful life, based on the difference between the asset's replacement value for identical capacity and functions, and the original value. The replacement value is adjusted at each year-end based on indexes from official publications, and the impact of the adjustment is spread over the residual useful life of the assets concerned.

When assets are replaced, amortisation recognised on the portion of assets considered to be financed by the grantor, and the provision for replacement established for the relevant asset, are cancelled and transferred to rights in existing assets. 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 replacement to become the grantor's rights in existing assets, with no outflow of cash to the benefit of the grantor.

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.

The changes in special concession liabilities for existing assets and assets to be replaced are as follows:

(in millions of euros)	31/12/2020	31/12/2019
Value in kind of assets[1]	52,907	51,085
Unamortised financing by the operator	(28,730)	(27,387)
Rights in existing assets – net value	**24,177**	**23,698**
Amortisation of financing by the grantor	15,000	14,389
Provisions for replacement	9,243	9,378
Rights in assets to be replaced	**24,243**	**23,767**
SPECIAL FRENCH PUBLIC ELECTRICITY DISTRIBUTION CONCESSION LIABILITIES	**48,420**	**47,465**

[1]Including contributions received to finance concession assets, amounting to €108 million (€131 million in 2019). In 2020 they include €399 million resulting from incorporation of the rising mains in application of the ELAN law.

NOTE 12 INVESTMENTS IN ASSOCIATES AND JOINT VENTURES

Investments in associates and joint ventures are as follows:

		31/12/2020			31/12/2019	
(in millions of euros)	Notes	Ownership%	Share of net equity	Share of net income	Share of net equity	Share of net income
Principal investments in associates						
CTE	12.1	50.10	1,378	237	1,417	308
Taishan (TNPJVC) [1]	12.2	30.00	n.c.	n.c.	1,165	13
Other investments held by EDF SA	12.3	n.a	1,742	-	1,448	59
Investments held by EDF Renewables	12.3	n.a	1,198	70	1,063	77
Other investments in associates and joint ventures	12.3	n.a	n.c.	n.c.	1,321	62
Subtotal			**6,794**	**362**	**6,414**	**519**
CENG (reclassified as assets held for sale)	3.2	49.99	n.a.	63	n.a	288
Alpiq (sold on 28 May 2019)	3.1.2	n.a	n.a.	n.a	n.a	11
Subtotal				**63**		**299**
TOTAL			**6,794**	**425**	**6,414**	**818**

n.a = not applicable
n.c. = not communicated
[1]The financial data for Taishan at 31 December 2020 are not reported in this table as CGN (Taishan's parent company) publishes its consolidated financial statements later than the Group.

12.1 COENTREPRISE DE TRANSPORT D'ÉLECTRICITÉ (CTE)

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

(in millions of euros)	31/12/2020	31/12/2019
Non-current assets	19,202	18,568
Current assets	3,712	3,120
Total assets	**22,914**	**21,688**
Equity	2,750	2,829
Non-current liabilities	15,630	15,059
Current liabilities	4,534	3,800
Total equity and liabilities	**22,914**	**21,688**
Sales	4,729	4,856
Operating profit before depreciation and amortisation	1,914	2,181
Net income	***473***	***615***
Net indebtedness	12,700	12,256
Gains and losses recorded directly in equity	(188)	(279)
Dividends paid	367	313

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.

12.2 TAISHAN

12.2.1 Taishan financial indicators

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

(in millions of euros)	31/12/2019	31/12/2018
Non-current assets	12,183	11,595
Current assets	618	451
Total assets	**12,801**	**12,046**
Equity	3,882	3,279
Non-current liabilities	7,467	7,777
Current liabilities	1,452	990
Total equity and liabilities	**12,801**	**12,046**
Sales	783	32
Net income	***44***	***(8)***
Dividends paid	-	-

12.2.2 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. Comprising two 1750-MW EPR reactors, Taishan nuclear power plant is the biggest cooperation project between China and France in the energy sector. CGN holds a 51% stake and Yudean a 19% stake.

Following the start of commercial operation by the first reactor on 13 December 2018, the second reactor began commercial operation on 7 September 2019. 2020 saw the first shutdown for refuelling of Taishan 1, from 29 June to 24 September 2020.

On 20 March 2019, the NDRC (National Development and Reform Commission) attributed regulated tariffs to the first three 3rd-generation nuclear projects in China, one of which is Taishan. The tariff attributed to Taishan was set at RMB435/MWh until the end of 2021, with retroactive effect to the date the first unit was commissioned (13 December 2018). Indexing mechanisms for the post-2021 tariffs were not set out in this decision and are not currently known. The impairment test at 31 December 2020 was updated to take account of the uncertainties over tariff levels and certain operating assumptions which were adjusted following the operations of 2020. The results confirmed the absence of impairment on the investment as stated in the financial statements at 31 December 2020.

12.3 OTHER INVESTMENTS IN ASSOCIATES AND JOINT VENTURES

The other investments held by EDF SA are included in dedicated assets (see note 15.1.2).

The other investments held by EDF Renewables are mainly located in the United States, Europe, China and Brazil.

Other investments in associates and joint ventures principally concern:

- the dam owned by Compagnie Énergétique de Sinop (CES) in Brazil, 51%-owned by the Group: the first turbine was commissioned in September 2019 and the second in October 2019;
- the Nachtigal dam in Cameroon, 40%-owned by the Group: construction began in March 2019, with commissioning expected in early 2024;
- the supercritical coal-fired plant owned by Jiangxi Datang International Fuzhou Power Generation Company Ltd. in China, 49%-owned by the Group.

In 2020, €(189) million of impairment was booked in respect of investments in associates and joint ventures concerning various specific assets: certain coal-fired plants in China, investments held by Framatome in entities operating in sectors greatly impacted by the Covid-19 pandemic, and certain unlisted assets owned by EDF SA (EDF Invest) included in dedicated assets (see note 15.1.2).

In 2019, €(73) million of impairment was booked in respect of investments in associates and joint ventures, concerning various specific assets of non-significant individual amounts.

Developments in investments accounted for by the equity method owned by EDF Renewables in 2020

EDF Renewables - Jinko Power consortium reached the financial closing of the world's largest solar project and launched its construction in Abu Dhabi

On 22 December 2020, the consortium, formed by French **EDF Group** subsidiary, **EDF Renewables** and Chinese **Jinko Power HK**, subsidiary of **Jinko Power Technology Co. Ltd**, have successfully reached the financial closing for the 2.1 GW Al Dhafra PV2 solar project in Abu Dhabi, United Arab Emirates. This operation has been completed along with TAQA Group and Masdar, the Abu Dhabi-based shareholders and major players in the electricity and renewable sectors.

The approximately 1 billion USD transaction has been funded via project financing from a banking group.

Completion of this major milestone allows the mobilization on site and start of construction. Located in the region of Al Dhafra, 35 kilometres south of Abu Dhabi City, this solar photo-voltaic plant will be the largest single-site solar plant worldwide. The plant spans over 20 square kilometres of desert climate area, with more than 4 million PV modules.

Upon commissioning, targeted in 2022, this project will provide the equivalent electricity to power over 160,000 local households.

As the project is under an independent power producer model (IPP), EDF Renewables and Jinko Power hold respectively 20% of the shares, the remaining 60% is owned by TAQA and Masdar.

The four partners had previously signed the 30-years Power Purchase Agreement (PPA) on 23 July 2020.

EDEN Renewables India increases its portfolio with new solar photovoltaic power plants

On 1 October 2020, EDF Renewables and Total Eren, two world leaders in renewable energy, announced that EDEN Renewables India, their equally owned joint venture dedicated to the Indian solar photovoltaic market, had been awarded three solar photovoltaic (PV) projects for a total of 1,350MWp in Rajasthan, Northern India.

At 31 December 2020, EDEN Renewables confirmed its ambitions in India, with more than 1.2GW of wind and solar power projects in operation or construction.

EDEN Renewables also expanded its portfolio of projects, notably by winning the following projects between April and July 2020:

- two 450MWp[1] solar PV projects during the last tenders organised by the Solar Energy Corporation of India (SECI VIII and SECI IX);
- one 450MWp[1] solar PV project during the last tender organised by the National Hydro Power Corporation (NHPC), for which a 25-year Power Purchase Agreement (PPA) was signed with NHPC at the end of August 2020.

With expected output of more than 2,300GWh per year, these solar PV plants will generate the energy required to meet the annual electricity needs of nearly 2 million people in India.

Construction of the plants is due to start during the first half-year of 2021 and commissioning is expected in 2022-2023.

1 Equivalent to 300MWac

EDF Renewables, Enbridge and wpd start construction of the Fécamp offshore wind farm

On 2 June 2020, EDF Renewables, Enbridge Inc., a leading energy infrastructure company in North America, and wpd, a European renewable energy company, announced the start of construction for the Fécamp offshore wind farm following the finalisation of financing agreements between the consortium and its financial partners.

The 500MW Fécamp offshore wind farm will be composed of 71 wind turbines located between 13km and 22km from the coast of northwest France. Project commissioning is scheduled for 2024.

The total project capital cost is estimated at €2 billion, mostly to be financed through non-recourse project level debt. Fécamp offshore wind farm is underpinned by a 20-year power purchase agreement (PPA) granted by the French state in June 2018.

All the project partners possess considerable experience in offshore wind farms and in the delivery of large-scale industrial projects:

- **EDF Renewables**, which owns 35% of the project through Éolien Maritime France, brings its expertise in the development, construction and operation of renewable energy projects, including in the offshore wind sector.
- **Enbridge Inc.**, which owns 35% of the project through Éolien Maritime France, is a leading North American energy infrastructure company.
- **wpd offshore**, which owns 30% of the project, is one of the pioneers and leaders of offshore wind power.

Partnership between EDF and CEI groups for construction and operation of offshore wind power projects in China

On 2 June 2020, EDF and China Energy Investment Corporation (CEI) announced a new step in their industrial partnership through the conclusion of an agreement of the joint venture agreements for the Dongtai IV and V projects. The new joint venture is now building and operating 502MW of offshore wind power projects off the coast of Jiangsu Province (north of Shanghai), China.

The agreement concerns Dongtai IV, a 302MW wind farm fully commissioned in December 2019 and Dongtai V, a 200MW project now in construction and due to be commissioned in 2021. Together, the partners will continue the construction of the Dongtai V offshore wind farm and carry out operations and maintenance for both facilities. These projects are the EDF group's first offshore wind projects in China.

The Group has taken a 37.5% stake in the joint venture through its subsidiaries EDF Renewables and EDF (China) Holding Ltd., while CEI group continues to hold the rest of the capital through its subsidiaries Shenhua Renewable and Shenhua Clean Energy Holdings.

The joint venture is accounted for by the equity method in the Group's consolidated financial statements.

Changes in the scope of consolidation are presented in note 3.1.1, particularly the principal acquisitions in renewable energies in 2019.

NOTE 13 WORKING CAPITAL

13.1 WORKING CAPITAL: COMPOSITION AND CHANGE

13.1.1 Composition of working capital

Changes in net working capital during 2020 are as follows:

(in millions of euros)	Notes	31/12/2019	Monetary changes	Non-monetary changes	31/12/2020
Inventories and work-in-process	13.2	**(14,049)**	(873)	184	**(14,738)**
Trade receivables net of provisions	13.3	**(15,606)**	842	243	**(14,521)**
Trade payables	13.4	**12,867**	(861)	(106)	**11,900**
Compensation receivable for Public Energy Service charges (CSPE receivable)	13.3.4	**(1,667)**	(328)	2	**(1,993)**
Other receivables and payables[1]	13.3.4 and 13.5	**9,379**	(189)	361	**9,551**
Other components of working capital[2]		**(726)**	(270)	255	**(740)**
NET WORKING CAPITAL		**(9,802)**	**(1,679)**	**939**	**(10,541)**

[1] Excluding receivables and payables on acquisition/disposal of assets and investment subsidies.
[2] The other components of working capital includes CO_2 emission rights and green certificates presented in intangible assets in the balance sheet, and derivatives related to operations.

13.1.2 Non-monetary changes in working capital

Non-monetary changes include the effect of changes in the scope of consolidation, foreign exchange effects, changes in fair values and the effect of reclassifications. The variation in non-monetary changes compared to 2019 is principally due to a €320 foreign exchange effect (particularly on inventories, trade receivables and trade payables due to the decline of the pound sterling against the Euro) and changes in the fair value of derivatives related to operations, amounting to €239 million.

13.1.3 Monetary changes in working capital

(in millions of euros)	Notes	2020	2019[1]
Change in inventories	13.2	(873)	191
Change in trade receivables	13.3	842	199
Change in trade payables	13.4	(861)	(48)
Change in the Compensation receivable for Public Energy Service charges (CSPE receivable)	13.3.4	(328)	(864)
Change in other receivables and payables[2]	13.3.4 and 13.5	(459)	997
CHANGE IN WORKING CAPITAL		**(1,679)**	**475**

[1] Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).
[2] The change in other receivables and payables includes monetary changes in CO_2 emission rights and green certificates presented in intangible assets in the balance sheet, and derivatives related to operations.

Monetary changes in working capital were down by €(1,679) million in 2020, principally due to the significant increase in inventories (rise in stocks of capacity certificates and energy savings certificates – see note 13.2) and changes in terminated positions and margin calls in the trading activity. These two factors also account for most of the difference in the change in working capital between 2019 and 2020.

13.2 INVENTORIES

Accounting principles and methods

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 materials costs, labour costs, and a share of indirect production costs.

Nuclear fuel

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, fabrication, 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 ministerial order 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 fabrication) 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.

Other inventories

Other inventories comprise:

- other fuels, comprising fossil fuels required for operation of fossil-fired power plants and gas stocks;
- other operating supplies, consisting of operating materials and equipment such as spare parts supplied under a maintenance programme (excluding capitalised strategic safety spare parts);
- goods and services in progress, particularly relating to the businesses of EDF Renewables, Dalkia and Framatome;
- other inventories, mainly consisting of certificates issued under the various environmental schemes (see notes 5.4.3 and 10.2) and capacity obligation mechanisms (capacity guarantees in France – see note 5.1).

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.

The carrying value of inventories, broken down by nature, is as follows:

	31/12/2020			31/12/2019		
(in millions of euros)	Gross value	Provision	Net value	Gross value	Provision	Net value
Nuclear fuel	10,564	(33)	10,531	10,649	(4)	10,645
Other fuel	770	(42)	728	872	(30)	842
Other supplies	1,660	(398)	1,262	1,624	(360)	1,264
Work-in-progress for production of goods and services	469	(33)	436	497	(30)	467
Other inventories	1,804	(23)	1,781	869	(38)	831
TOTAL INVENTORIES	**15,267**	**(529)**	**14,738**	**14,511**	**(462)**	**14,049**

The long-term portion (more than one year) mainly concerns nuclear fuel inventories amounting to €8,068 million at 31 December 2020 (€7,828 million at 31 December 2019).

The value of EDF Trading's inventories stated at market value is recognised in "Other fuel" and "Other inventories" and stands at €300 million at 31 December 2020 (€141 million at 31 December 2019).

The increase in the value of "Other inventories" over 2020 is mainly related to capacity guarantees in France, due to the increase in purchase prices observed since the June 2020 auctions (see note 5.1), and energy savings certificates inventories (see note 5.4.3).

13.3 TRADE RECEIVABLES

Accounting principles and methods

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.

Details of net trade receivables are as follows:

(in millions of euros)	Note	31/12/2020	31/12/2019
Trade receivables, gross value – excluding EDF Trading		14,686	15,066
- contract assets	13.3.3	*389*	*400*
Trade receivables, gross value – EDF Trading		1,036	1,583
Impairment[(1)]		(1,201)	(1,043)
TRADE RECEIVABLES - NET VALUE		**14,521**	**15,606**

[(1)] *see note 1.4.1.3.*

Most trade receivables mature within one year.

Advances received from customers in France who pay in regular monthly instalments, amounting to €6,782 million at 31 December 2020 (€6,719 million at 31 December 2019), are deducted from trade receivables.

13.3.1 Trade receivables due and not yet due

	31/12/2020			31/12/2019		
(in millions of euros)	Gross value	Provision	Net value	Gross value	Provision	Net value
TRADE RECEIVABLES	**15,722**	**(1,201)**	**14,521**	**16,649**	**(1,043)**	**15,606**
overdue by up to 6 months	1,249	(242)	1,007	1,262	(187)	1,075
overdue by 6-12 months	465	(193)	272	367	(124)	243
overdue by more than 12 months	851	(526)	325	940	(514)	426
Trade receivables due	**2,565**	**(961)**	**1,604**	**2,569**	**(825)**	**1,744**
Trade receivables not yet due	**13,157**	**(240)**	**12,917**	**14,080**	**(218)**	**13,862**

13.3.2 Assignment of receivables

Accounting principles and methods

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.

(in millions of euros)	31/12/2020	31/12/2019
Trade receivables assigned and wholly retained in the balance sheet	84	-
Trade receivables assigned and partly retained in the balance sheet	60	32
Trade receivables assigned and wholly derecognised	792	1,042

The Group assigned trade receivables for a total of €792 millions at 31 December 2020, mainly concerning Edison, EDF SA and Dalkia (€1,042 million at 31 December 2019).

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.

13.3.3 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. Most contract assets mature within one year.

The contract assets included in receivables represent an amount of €389 million at 31 December 2020 and €400 million at 31 December 2019 and mainly concern Framatome, Dalkia and EDF Renewables.

13.3.4 Other receivables

Details of other receivables are as follows:

(in millions of euros)	31/12/2020	31/12/2019
Prepaid expenses	1,457	1,429
Compensation for Public Energy Service charges (CSPE)	1,993	1,667
VAT receivables	1,988	2,022
Other tax receivables	248	153
Other operating receivables	3,247	3,540
OTHER RECEIVABLES	**8,933**	**8,811**
Non-current portion	2,015	1,930
Current portion	6,918	6,881
Gross value	9,013	8,877
Impairment	(80)	(66)

Other operating receivables include €1,045 million of advances paid to suppliers (€1,278 million at 31 December 2019). Most of these advances concern the France – Generation and Supply segment.

EDF's Public Service Charges

The amount of expenses (excluding the annual contribution to repayment and associated interest) to be compensated to EDF for 2020 is €8,081 million.

The amounts received in 2020 (excluding the annual contribution to repayment and associated interest) totalled €7,732 million (including €5,333 million from the dedicated "energy transition" budget account and €2,399 million from the general budget).

Based on a receivable of €1,647 million at 31 December 2019, the operating receivable owed by the State to EDF amounts to €1,974 million at 31 December 2020. The situation will be closely monitored in view of the initial Finance Law for 2020 adopted by vote in late 2019, which provides for discontinuation of the special "energy transition" budget item from January 2021.

Finally, in accordance with decree 2016-158 of 18 February 2016 concerning compensation for public energy service charges, on 17 July 2020 the CRE published its decision 2020-177 of 15 July 2020 setting out a forecast of EDF's public service charges for 2021 (€8,104 million), a revised forecast of charges for 2020 (€8,122 million), and the actual charges recorded for 2019 (€7,585 million).

The compensation mechanism for public energy service charges in France is presented in note 5.4.1.

13.4 TRADE PAYABLES

(in millions of euros)	31/12/2020	31/12/2019
Trade payables – excluding EDF Trading	10,868	11,243
Trade payables – EDF Trading	1,032	1,624
TRADE PAYABLES	**11,900**	**12,867**

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.

13.5 OTHER LIABILITIES

Details of other liabilities are as follows:

(in millions of euros)	31/12/2020	Including contract liabilities	31/12/2019	Including contract liabilities
Advances and progress payments received	1,788	1,344	1,975	1,761
Liabilities related to property, plant and equipment	4,196	-	3,824	-
Tax liabilities	4,532	-	4,439	-
Social charges	4,712	-	4,535	-
Deferred income on long-term contracts	3,290	3,233	3,412	3,412
Other deferred income[(1)]	827	430	641	509
Other	2,390	-	2,712	-
OTHER LIABILITIES	**21,735**	**5,007**	**21,538**	**5,682**
Non-current portion	4,874	3,092	4,928	3,473
Current portion	16,861	1,915	16,610	2,209

(1) Including the initial payment made under the Fessenheim compensation protocol (see note 5.4.3).

13.5.1 Advances and progress payments received

Advances and progress payments received comprise €518 million of payments made by the customers in Framatome's long-term contracts (€651 million at 31 December 2019).

13.5.2 Tax liabilities

At 31 December 2020, tax liabilities mainly include an amount of €502 million for the CSPE to be collected by EDF on energy supplied but not yet billed, less the CSPE tax collected on advances from customers who pay in regular monthly instalments (€560 million at 31 December 2019).

13.5.3 Deferred income on long-term contracts

EDF's deferred income on long-term contracts at 31 December 2020 comprises €1,713 million (€1,709 million at 31 December 2019) 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).

13.5.4 Other

Accounting principles and methods

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.

The final line of the table of other liabilities includes investment subsidies received during 2020, amounting to €414 million (€543 million in 2019).

13.5.5 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.

Changes in contract liabilities were as follows:

(in millions of euros)	31/12/2019	Amounts recorded during the period	Amounts transferred to sales during the period	Amounts cancelled during the period with no impact on sales	Effect of unwinding the discount	Change in scope of consolidation	Foreign exchange effect	31/12/2020
Advance payments received	**1,761**	1,066	(1,429)	(25)	(1)	4	(32)	**1,344**
Deferred income on long-term contracts	**3,412**	465	(705)	-	60	14	(13)	**3,233**
Other deferred income	**509**	320	(390)	-	-	1	(10)	**430**

These liabilities comprise the majority of advances and progress payments received, amounting to €1,344 million (principally concerning the Framatome, United Kingdom and France – Regulated Activities segments), and the majority of deferred income (on long-term and other contracts), amounting to €3,663 million (principally concerning the France – Generation and Supply segment). They thus total €5,007 million at 31 December 2020 (€5,682 million at 31 December 2019).

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 €10,910 million which have not yet been recognised. €1,183 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 14 EQUITY AND BASIC EARNINGS PER SHARE AND DILUTED EARNINGS PER SHARE

14.1 SHARE CAPITAL

Accounting principles and methods

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.

At 31 December 2020, EDF's share capital amounts to €1,549,961,789.50 comprising 3,099,923,579 fully subscribed and paid-up shares with nominal value of €0.50, owned 83.68% by the French State, 14.94% by the public (institutional and private investors) and 1.36% by current and retired Group employees, with 0.02% held by EDF as treasury shares.

In 2020, the change in capital is related to the cancellation of treasury shares.

In 2019, the changes in capital included €881 million related to payment of the balance of the scrip dividend for 2018 and the interim dividend for 2019.

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.

14.2 TREASURY SHARES

Accounting principles and methods

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.

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 2020, treasury shares deducted from consolidated equity represent 830,000 shares with total value of €10 million.

14.3 DIVIDENDS

The interim dividend for 2019 decided by EDF's Board of Directors on 19 November 2019 was €0.15 per share. It was paid out in the form of new shares (scrip option) or cash on 17 December 2019 and amounted to a total of €458 million. The French government opted for the scrip interim dividend for 2019. The cash dividend paid to shareholders who did not take the scrip option amounted to €27 million.

In the context of the Covid-19 pandemic, in response to the imperative needs for solidarity and responsibility to all the company's stakeholders, it was decided at the General Shareholders' Meeting of 7 May 2020 that the interim dividend would be the only dividend for 2019.

In addition, EDF did not distribute an interim dividend in respect of the 2020 financial year.

14.4 PERPETUAL SUBORDINATED BONDS

Accounting principles and methods

Perpetual subordinated bonds ("hybrid" bond issue)

The perpetual subordinated bonds issued by the Group 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. 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.

14.4.1 Outstanding perpetual subordinated bonds at 31 December 2020

At 31 December 2020, perpetual subordinated bonds carried in equity amounted to €11,290 million (less net-of-tax transaction costs) (€9,209 million at 31 December 2019).

Issues of perpetual subordinated bonds were recorded in equity at 31 December 2020 at the total net value of €2,081 million (see note 14.4.2).

Interest paid by EDF to the bearers of perpetual subordinated bonds issued totalled €501 million in 2020 and €589 million in 2019. The resulting cash payout is reflected in a corresponding reduction in Group equity.

In January 2021, EDF paid interest of around €276 million to the bearers of perpetual subordinated bonds.

Perpetual subordinated bonds in the accounts of EDF

(in millions of currency units)

Entity	Issue	Nominal amount	Currency	Redemption option	Coupon
EDF	01/2013	1,250	EUR	12 years	5.38%
EDF	01/2013	1,250	GBP	13 years	6.00%
EDF	01/2013	2,098	USD	10 years	5.25%
EDF	01/2014	1,500	USD	10 years	5.63%
EDF	01/2014	267	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%
EDF	11/2019	500	EUR	8 years	3.00%
EDF	09/2020	850	EUR	6.5 years	2.88%
EDF	09/2020	1,250	EUR	10 years	3.38%

14.4.2 Changes in perpetual subordinated bonds during 2020

Hybrid note issues

On 8 September 2020, EDF launched two new issues of Euro-denominated hybrid notes for a total nominal amount of €2.1 billion, consisting of:

- a €850 million perpetual non-call hybrid notes issue with an initial coupon of 2.875% and a first redemption at the option of the Company on 15 December 2026 ; and
- a €1.250 billion perpetual non-call hybrid notes issue with an initial coupon of 3.375% and a first redemption at the option of the Company on 15 June 2030.

The Company can redeem the hybrid notes for cash at any time during the 90 days before the first interest reset date, which is expected to be in 6.5 years (with a first reset date of March 2027) for the 6.5-year non-call hybrid notes, and in 10 years (with a first reset date of September 2030) for the 10-year non-call hybrid notes, and on every coupon payment date thereafter.

The settlement date was 15 September 2020 and the hybrid notes were admitted to trading on the regulated market of Euronext Paris at that date.

These issues show the Company's strong commitment to financing through hybrid capital securities, which are a permanent part of its capital structure. The proceeds of the hybrid notes issue are used for general corporate purposes of the Company.

The hybrid notes have been admitted to trading on Euronext Paris. The rating agencies have assigned the hybrid notes a rating of Baa3/BB-/BBB (Moody's/S&P/Fitch), and an equity content of 50%.

This issue was recorded in equity upon reception of the proceeds, total net value of €2,081 million.

14.5 CONVERTIBLE GREEN BONDS *(OCEANES)*

Accounting principles and methods

***OCEANEs* (bonds convertible into new shares and/or exchangeable for existing shares)**

OCEANE bonds, which are convertible by remittal of a fixed number of shares in exchange for a fixed amount of cash (the "fixed-for-fixed" rule) give rise to recognition of a debt component and an equity component, in accordance with IAS 32.

The debt-equity proportions remain constant even if there is a change in the likelihood that the conversion option will be exercised.

The debt component is measured by the discounted future cash flows method using a discount rate applicable to a comparable market bond with no conversion option. The equity component corresponds to the difference between the fair value of the bond and the fair value of the debt component.

Issue expenses are allocated between the debt and equity components in the same proportions as the initial allocation.

On 8 September 2020, EDF made an issuance of green bonds convertible into new shares and/or exchangeable for existing shares (*OCEANEs Vertes*) with the nominal amount of €2,400 million and an issue value of €2,569 million. These bonds are recorded at an amount of €2,389 million net of expenses and taxes in "Financial loans and borrowings" and €126 million in "Equity". The key features of this issue are presented in note 18.3.2.2.

14.6 NON-CONTROLLING INTERESTS (MINORITY INTERESTS)

14.6.1 Details of non-controlling interests

	31/12/2020			31/12/2019	
(in millions of euros)	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%	2,526	(91)	2,764	(16)
NNB Holding Ltd.	33.5%	4,716	1	3,977	5
EDF Investissements Groupe SA	7.54%	515	11	516	10
Luminus SA	31.4%	400	(5)	376	(6)
Framatome	24.5%	115	(26)	163	(22)
Other non-controlling interests		**1,321**	**75**	**1,528**	**56**
TOTAL		**9,593**	**(35)**	**9,324**	**27**

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 EDF Investissements Groupe correspond to the investment held by Natixis Belgique Investissements.

Non-controlling interests in Luminus correspond to the investments held by Belgian local authorities.

Non-controlling interests in Framatome, 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.

Other non-controlling interests principally consist of the minority interests in Sizewell C Holding Co., owned 80% by the Group via EDF Energy, 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 €202 million at 31 December 2020 (€239 million in 2019).

14.6.2 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)	31/12/2020	31/12/2019
Non-current assets	23,317	25,807
Current assets	4,399	3,649
Total assets	**27,716**	**29,456**
Equity	12,630	13,820
Non-current liabilities	14,741	15,175
Current liabilities	345	461
Total equity and liabilities	**27,716**	**29,456**
Sales	3,091	2,807
Net income	(455)	(81)
Gains and losses recorded directly in equity	**(735)**	**841**
Net cash flow from operating activities	982	328
Net cash flow from investing activities	(380)	(474)
Net cash flow from financing activities	(335)	-
Cash and cash equivalents – opening balance	**329**	**472**
Net increase/(decrease) in cash and cash equivalents	267	(146)
Effect of currency fluctuations	(11)	17
Other	-	(14)
Cash and cash equivalents – closing balance	**585**	**329**
Dividends paid to non-controlling interests	68	-

14.7 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)	2020	2019[1]
Net income attributable to ordinary shares	650	5,155
▪ *EDF net income from continuing operations*	*804*	*5,639*
▪ *EDF net income from discontinued operations*	*(154)*	*(484)*
Payments on perpetual subordinated bonds	(501)	(589)
Net income used to calculate earnings per share	**149**	**4,566**
▪ *from continuing operations*	*303*	*5,050*
▪ *from discontinued operations*	*(154)*	*(484)*
Cancellation of the effect of dilutive instruments	1	-
Net income used to calculate diluted earnings per share	**150**	**4,566**
▪ *from continuing operations*	*304*	*5,050*
▪ *from discontinued operations*	*(154)*	*(484)*
Average weighted number of ordinary shares outstanding during the year	**3,106,323,609**	**3,029,504,511**
Effect of dilutive instruments	9,149,131	-
Average weighted number of diluted shares outstanding during the year	**3,115,472,740**	**3,029,504,511**
Earnings per share (in euros):		
BASIC EARNING PER SHARE	**0.05**	**1.50**
DILUTED EARNINGS PER SHARE	**0.05**	**1.50**
BASIC EARNINGS PER SHARE OF CONTINUING OPERATIONS	**0.10**	**1.67**
DILUTED EARNINGS PER SHARE OF CONTINUING OPERATIONS	**0.10**	**1.67**
BASIC EARNINGS PER SHARE OF DISCONTINUED OPERATIONS	**(0.05)**	**(0.17)**
DILUTED EARNINGS PER SHARE OF DISCONTINUED OPERATIONS	**(0.05)**	**(0.17)**

[1] *Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).*

On 8 September 2020, EDF issued unsecured senior green bonds convertible into new shares and/or exchangeable for existing shares of the Company (*OCEANEs Vertes,* see note 18.3.2.2). The diluted earnings per share incorporates the impact of conversion of these bonds, which is possible from 15 December 2020. The impact on the net income used to calculate diluted earnings per share for 2020 is not significant.

NOTE 15 PROVISIONS RELATED TO NUCLEAR GENERATION AND DEDICATED ASSETS

Accounting principles and methods

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 operations, based on independent expert reports, or contractor quotes. The various assumptions are reviewed for each closing of the accounts.

In the case of decommissioning provisions for power plants in operation, adjustments are recorded via fixed assets.

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

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;
- in the income statement in all other cases.

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;
- costs relating to fuel in the reactor when the reactor is shut down (provisions for last cores). These correspond to the cost of the fuel stock in the reactor that is not totally spent at the time of the final reactor shutdown and cannot be reused due to technical and regulatory constraints, the cost of processing for that fuel, and the cost of removal and storage of the resulting waste.

Obligations can vary noticeably depending on each country's legislation and regulations, and the technologies and industrial scenarios involved.

The breakdown between current and non-current provisions related to nuclear generation is as follows:

	31/12/2020			31/12/2019		
(in millions of euros)	Current	Non-current	Total	Current	Non-current	Total
Provisions for the back-end of the nuclear cycle	1,430	26,137	**27,567**	1,432	23,822	**25,254**
Provisions for decommissioning and last cores	723	32,196	**32,919**	364	31,761	**32,125**
Provisions related to nuclear generation	**2,153**	**58,333**	**60,486**	**1,796**	**55,583**	**57,379**

The breakdown of provisions by company is shown below:

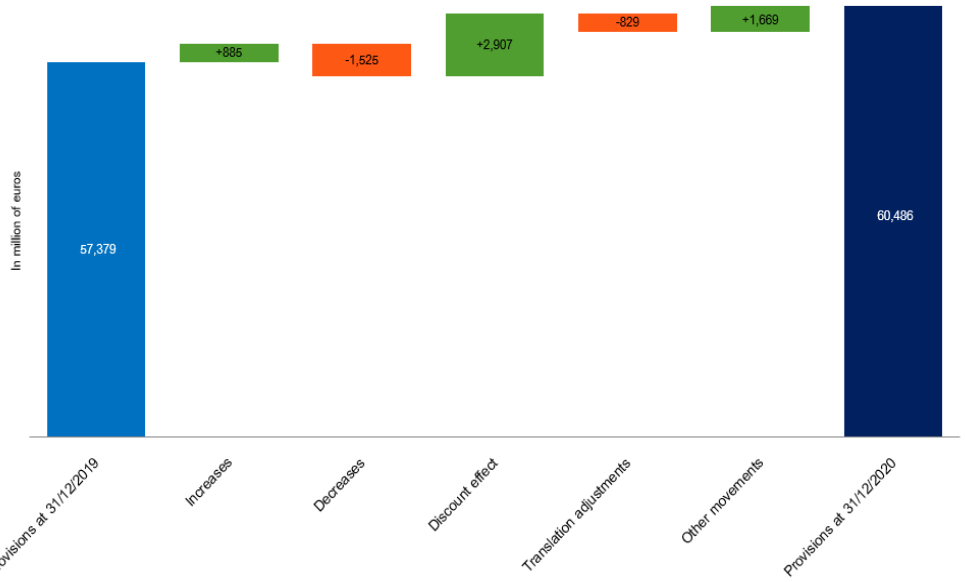
	EDF	EDF Energy	Belgium	Total
(in millions of euros)	Note 15.1	Note 15.2	Note 15.3	
Provisions for spent fuel management	11,322	1,286	-	**12,608**
Provisions for waste removal and conditioning	-	546	-	**546**
Provisions for long-term radioactive waste management	13,300	1,106	7	**14,413**
PROVISIONS FOR THE BACK-END OF THE NUCLEAR CYCLE AT 31/12/2020	24,622	2,938	7	27,567
Provisions for the back-end of the nuclear cycle at 31/12/2019	**22,159**	**3,088**	**7**	**25,254**
Provisions for nuclear plant decommissioning	17,489	10,170	377	**28,036**
Provisions for last cores	2,711	2,172	-	**4,883**
PROVISIONS FOR DECOMMISSIONING AND LAST CORES AT 31/12/2020	20,200	12,342	377	32,919
Provisions for decommissioning and last cores at 31/12/2019	**19,561**	**12,195**	**369**	**32,125**
PROVISIONS RELATED TO NUCLEAR GENERATION AT 31/12/2020	44,822	15,280	384	60,486
Provisions related to nuclear generation at 31/12/2019	**41,720**	**15,283**	**376**	**57,379**

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)	31/12/2019	Increases	Decreases	Discount effect	Translation adjustments	Other movements	31/12/2020
Provisions for spent fuel management	12,326	639	(950)	660	(79)	12	12,608
Provisions for waste removal and conditioning	1,337	9	(25)	56	(29)	(802)	546
Provisions for long-term radioactive waste management	11,591	104	(221)	1,069	(58)	1,928	14,413
Provisions for the back-end of the nuclear cycle	**25,254**	**752**	**(1,196)**	**1,785**	**(166)**	**1,138**	**27,567**
Provisions for nuclear plant decommissioning	27,609	133	(230)	957	(557)	124	28,036
Provisions for last cores	4,516	-	(99)	165	(106)	407	4,883
Provisions for decommissioning and last cores	**32,125**	**133**	**(329)**	**1,122**	**(663)**	**531**	**32,919**
PROVISIONS RELATED TO NUCLEAR GENERATION	**57,379**	**885**	**(1,525)**	**2,907**	**(829)**	**1,669**	**60,486**
Current portion	**1,796**						**2,153**
Non-current portion	**55,583**						**58,333**

The change in provisions related to nuclear generation in 2020 is mainly due to a 20bp decrease in the real discount rate in France and the United Kingdom. The corresponding effects are included in the "Discount effect" (€1,042 million) for provisions adjusted through the income statement, and in "Other movements" (€1,351 million) for changes in provisions backed by assets (assets associated with provisions and underlying assets in France and the United Kingdom; the receivable representing amounts due from the Nuclear Liabilities Fund (NLF) and the British government in the United Kingdom).

Details of the change in provisions related to nuclear generation in 2020 are as follows:



15.1 PROVISIONS RELATED TO NUCLEAR GENERATION AND DEDICATED ASSETS IN FRANCE

15.1.1 Nuclear provisions

In France, the provisions established by EDF SA for the nuclear generation fleet result ¨principally 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 above:

- EDF books provisions to cover all obligations related to the nuclear facilities it operates;
- EDF also holds dedicated assets for secure financing of long-term obligations (see note 15.1.2).

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 described in note 1.3.4.2.

Details of changes in provisions for the back-end of the nuclear cycle, decommissioning and last cores in France are as follows:

(in millions of euros)	Notes	31/12/2019	Increases	Decreases	Discount effect	Other movements	31/12/2020
Provisions for spent fuel management	15.1.1.1	10,823	625	(744)	626	(8)	11,322
- amount unrelated to the operating cycle		*1,152*	*65*	*(14)*	*109*	*(15)*	*1,297*
- amount outside the scope of the Law of 28 June 2006		*1,019*	*41*	*(35)*	*51*	-	*1,076*
Provisions for waste removal and conditioning	15.1.1.2	805	6	(25)	46	(832)	-
Provisions for long-term radioactive waste management	15.1.1.2	10,531	101	(221)	1,016	1,873	13,300
Provisions for the back-end of the nuclear cycle		**22,159**	**732**	**(990)**	**1,688**	**1,033**	**24,622**
Provisions for nuclear plant decommissioning	15.1.1.3	16,937	133	(181)	780	(180)	17,489
Provisions for last cores	15.1.1.4	2,624	-	(99)	94	92	2,711
Provisions for decommissioning and last cores		**19,561**	**133**	**(280)**	**874**	**(88)**	**20,200**
PROVISIONS RELATED TO NUCLEAR GENERATION		**41,720**	**865**	**(1,270)**	**2,562**	**945**	**44,822**
Provisions related to nuclear generation within the scope of the Law of 28 June 2006[(1)]		***40,701***	***824***	***(1,235)***	***2,511***	***945***	***43,746***
Provisions related to nuclear generation outside the scope of the Law of 28 June 2006[(1)]		***1,019***	***41***	***(35)***	***51***	***-***	***1,076***

[(1)]Scope of application of the law of 28 June 2006 on the sustainable management of radioactive materials and waste and its application decrease concerning secure financing of nuclear expenses. The provisions that do not fall within the scope of this law are provisions for the back-end of the nuclear cycle concerning non-EDF installations (see below).

The discount effect comprises the €1,520 million cost of unwinding the discount, and the €1,042 million effects of the change in the real discount rate in 2020 which were recorded in the income statement for provisions with no related assets (costs of unwinding the discount).

Other movements mainly include :

- the €707 million effect of the change in the real discount rate at 31 December 2020 for provisions with related assets;
- reclassification of €841 million previously included in provisions for waste removal and conditioning and €813 million previously included in provisions for nuclear plant decommissioning (corresponding to the cost of interim storage and processing of steam generators in a centralised facility), as provisions for long-term radioactive waste management, to ensure consistency with the most recent official breakdown of nuclear expenses in defined operations attached to the amended ministerial order of 21 March 2007 on secure financing of nuclear expenses.

Concerning non-EDF installations:

- EDF, COGEMA (now Orano Recyclage) 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 Recyclage) 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 Orano Recycle 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.

15.1.1.1 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 management cover the following services to be provided by Orano Recyclage:

- 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 contract, signed on 5 February 2016, covers the period 2016-2023. These contracts contain price indexes that are revised annually.

In 2018, the Board of Directors approved resumption of recycling of uranium from reprocessing (which had been 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 objective is to start recycling in certain 900MW units, and later in certain 1300MW units. The corresponding contracts were signed with the respective suppliers in the second quarter of 2018. In 2020, EDF continued to monitor the plants' preparation trajectory with reference to those contracts and conducted tests of the interfaces between suppliers. The portion of the provision for spent fuel management relating to storage of uranium from reprocessing (€882 million) 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.

This provision also covers long-term storage of spent fuel that cannot currently be recycled in existing industrial facilities or under construction: plutonium fuel (MOX) or uranium fuel derived from processing, and fuel from Creys-Malville and Brennilis until fourth-generation reactors become available. Dedicated assets are held in association with this provision, which is unrelated to the operating cycle as defined by the law (see note 15.1.2). The provision is founded on a scenario involving construction, managed by EDF (that will be the nuclear operator), of a centralised underwater storage site at La Hague. This project was presented during the public debate on the National Plan for Managing Radioactive Matter and Waste in 2019-2020, and will be subjected to a specific public consultation in 2021, organised by France's National Public Debate Commission (CNDP).

15.1.1.2 Provisions for long-term radioactive waste management

Following the reclassifications applied at 31 December 2020 as explained in 15.1.1, provisions for long-term radioactive waste management concern the following future expenses:

- interim storage, 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;
- characterisation, processing, conditioning and interim storage of radioactive waste resulting from decommissioning and certain operating waste – these operations were previously covered by the provisions for nuclear plant decommissioning and provisions for waste removal and conditioning;
- final storage of this radioactive waste;
- 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 in particular 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)	Storage centre	31/12/2020	31/12/2019
Very low-level and low and medium-level waste	Very low-level waste: Morvilliers (ANDRA) Low and medium-level waste: Soulaines (ANDRA)	2,856	1,561
Long-lived low-level waste	Project under examination: Soulaines (ANDRA)	365	330
Long-lived medium and high-level waste	Geological storage centre (Cigéo project)	10,079	8,640
PROVISIONS FOR LONG-TERM RADIOACTIVE WASTE MANAGEMENT		**13,300**	**10,531**

Very low-level and low and medium-level waste

Very low-level waste and low and medium-level waste comes from nuclear facilities in operation or in the process of being decommissioned:

- very low-level waste mainly comes from nuclear plant decommissioning, and generally takes the form of metals (large components, piping , support structures, etc) or rubble (concrete, earth, etc). This type of waste is stored at surface level at the Morvilliers storage centre managed by ANDRA;
- low and medium-level waste (gloves, filters, resins, materials, etc) is stored at surface level at the Soulaines storage centre managed by ANDRA .

The cost of removing, processing and storing short-lived waste (very low-level and low and medium-level) is assessed on the basis of current contracts with transporters, ANDRA for operation of the existing storage centres and the costs of the Cyclife France plant for waste processing.

In 2019, the inventory assumptions were updated by a time series analysis of past waste removal and better characterisation of future volumes, leading to a €206 million increase in the provision (with an unfavourable effect of €132 million on the income statement, while the rest of the change was recognised via adjustments to fixed assets).

In 2020, the assumptions concerning the shares of costs were reassessed, to reflect the long-term distribution between the three producers concerned of fixed storage costs for very low-level waste and low and medium-level waste. All the effects of this cost-share updating work have led to a €179 million increase in the provision (with an unfavourable effect of €50 million on the income statement, while the rest of the change was recognised via adjustments to fixed assets).

Also, since 31 December 2020, following the reclassifications presented in note 15.1.1 to ensure consistency with the most recent official breakdown of nuclear expenses attached to the amended ministerial order of 21 March 2007 on secure financing of nuclear expenses, the provision established for very low-level and low and medium-level waste also covers the treatment, conditioning and interim storage of waste; many of these operations were previously included in the provisions for nuclear plant decommissioning and waste removal and conditioning (reclassification of €979 million applied at 31 December 2020).

Finally, for very low-level waste, in February 2020, following public debate of 2019-2020 concerning the French National Plan for the Management of Radioactive Materials and Waste (PNGMDR), the conclusions of the Ministry for the Ecological and Inclusive Transition and the ASN pave the way for a change in regulations that would allow recycling of very low-level metal waste after processing: “The Government will make changes to the regulatory framework applicable to the management of very low-level waste, in order to introduce a new possibility of targeted exceptions, allowing recycling, after fusion and decontamination and on a case by case basis, of very low-level radioactive metallic waste.” A change to the regulations had been proposed by the General Risk Prevention Department (DGPR) and submitted to public consultation.

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 were planned under the 2016-2018 period of the National Plan for the Management of Radioactive Materials and Waste (PNGMDR), concerning both the feasibility of this storage centre and the search for additional waste

management solutions. The ASN's opinion on management of this waste, issued on 6 August 2020 after the work done over the period 2016-2018, and the orientations proposed by the head of the PNGMDR in the current elaboration phase of the fifth edition of the PNGMDR, set a horizon of 2023 for definition by ANDRA of several reference management scenarios, and of the needs for complementary concepts and the production of a file (equivalent to a Summary Preliminary Plan or *avant-projet sommaire* - APS) presenting the technical and safety options selected for storage of long-lived low-level waste.

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, based on the 2011 inventory).

In 2012 ANDRA carried out preliminary conceptional studies for the Cigéo geological storage project.

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 divergences in the valuation of technical optimisations and their induced effects. 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.

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.

In April 2016 ANDRA sent the ASN a safety option report (DOS). The law of 11 July 2016 clarified the concept of reversibility.

On 11 January 2018, the ASN issued its opinion on the DOS. It considered that the Cigéo project had reached satisfactory overall technological maturity at that stage. This opinion included a requirement for examination of alternatives to the proposals for storage of bituminous waste at Cigéo. A group of experts appointed by the DGEC in September 2018 to draw up a report on current bituminous waste management concluded in September 2019 that various options were feasible (storage or neutralisation) but stressed the importance of continuing the studies in order to identify the most appropriate option.

Detailed design studies for Cigéo are currently being finalised by ANDRA. The Detailed Design Review by a group of independent experts, organised at the request of the DGEC, reported its conclusions in October 2020. While issuing a generally favourable opinion for the ANDRA's submission, the group made a certain number of recommendations for finalisation of the detailed design studies and the application for authorisation to create the centre, calling for closer involvement of EDF, Orano and the CEA on these matters.

Under the schedule prepared by ANDRA, the application to develop Cigéo (classified as a basic nuclear facility) is now due to be made in 2021, with a corresponding extension for obtaining authorisation. Producers are still currently working on the hypothesis that the first waste packages would be received in 2031.

On 3 August 2020, ANDRA filed an application with the Ministry for the Ecological Transition for *déclaration d'utilité publique* (DUP) officially recognising the public utility of the Cigéo storage centre. After examination by the government departments, this application will give rise to a public debate expected to take place in the second quarter of 2021. Publication of the DUP decree, which would automatically confer compatibility on the planning documents, is expected in late 2021.

Finally, the French finance law for 2021, published in the *Journal officiel* of 30 December 2020, includes a change to the tax treatment of this project (based on storage tax instead of the standard tax regime). The associated measures remain to be defined and managed by the Government to prevent any cost increase for the Cigeo project.

Also, since 31 December 2020, following the reclassifications presented in note 15.1.1 to ensure consistency with the most recent official breakdown of nuclear expenses attached to the amended ministerial order of 21 March 2007 on secure financing of nuclear expenses, the provision established for very low-level and low and medium-level waste also covers the conditioning and interim storage of low and medium-level waste at the ICEDA storage facility (*installation de conditionnement et d'entreposage des déchets activés*). This facility, constructed at the Bugey power plant, received its first waste packages in September 2020 after the ASN authorised its commissioning on 28 July 2020. These nuclear expenses were previously covered by the provisions for waste removal and conditioning (the reclassification at 31 December 2020 concerned an amount of €675 million).

15.1.1.3 Decommissioning provisions for nuclear power plants

EDF bears full technical and financial responsibility for decommissioning of the basic nuclear facilities (*installations nucléaires de base*, INB) it operates. The final shutdown and decommissioning process is governed by legal provisions and regulations set out in Articles L. 593-25 to L 593-20 and R.593-65 to R.593-74 in the environmental code. It involves the following operations for each INB:

- a definitive 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 of the INB, which takes place during its operating phase, 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);
- a dismantling plan compiled by the operator and sent to the minister in charge of nuclear safety, which after examination by the authorities and a public inquiry, leads to a decree prescribing dismantling that authorises the start of dismantling operations;
- key-stage progress reviews submitted for the ASN's approval, with a safety file specific to the dismantling operations to be performed;
- an internal control process concerning significant changes introduced by the operator in the case of operations that must be declared to or approved by the ASN;
- finally, once these operations are complete, declassification of the facility, which removes 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 nuclear fleet currently in operations, known as "first-generation" plants, and the Superphenix plant and Irradiated Materials Workshop. 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 at Chooz, 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 plant has the specificity of being located in a cave, making this a unique operation, generating experience that is not immediately transposable and involves specific challenges.

The experience gained from dismantling the Chooz PWR will nonetheless improve the robustness of the studies and estimates of future decommissioning costs for the nuclear fleet currently in operation ("second-generation" plants). 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 associated with the scale effect.

At Fessenheim, the two pressurised water reactors were shut down definitively on 22 February 2020 and 30 June 2020 respectively, in accordance with the law and before the end of their technical operating life. The Consolidated Preliminary Plan (*avant-projet consolidé* or APC) was finalised in late 2018, with more in-depth studies and derisking of the Summary Preliminary Plan (*avant-projet sommaire* or APS). The dismantling plan was sent to the ASN in September 2019 together with the declaration of the permanent shutdown of this INB. The studies conducted in 2019 and 2020 focused on preparing the dismantling plan, which was sent to the ASN on 2 December 2020. After the filing date, the ASN will examine the documents for a period of 3 to 5 years.

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).

Details of changes in decommissioning provisions for nuclear power plants are as follows:

(in millions of euros)	31/12/2019	Increases	Decreases	Discount effect	Other movements	31/12/2020
Provisions for decommissioning nuclear plants in operation	13,244	-	(43)	474	(900)	12,775
Provisions for decommissioning permanently shut-down nuclear plants	3,693	133	(138)	306	720	4,714
DECOMMISSIONING PROVISIONS FOR NUCLEAR POWER PLANTS	**16,937**	**133**	**(181)**	**780**	**(180)**	**17,489**

Other movements notably include reclassification of the decommissioning provision concerning the two Fessenheim reactors from "Provisions for decommissioning nuclear plants in operation" to "Provisions for decommissioning permanently shut-down nuclear plants" following their final shutdown in the first half of 2020.

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 La Guardia, 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 experience 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 series and mutualisation effects used to arrive at the estimate are explained below.

Series effects (effects of work for the first-of-a-kind site on the following sites of the same series) 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.

Mutualisation effects (effects between units in the same site, whether in operation or being decommissioned) are of several different types:

- 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 dismantled twice;
- certain costs are not higher when two or four reactors are dismantled on the same site. This is usually the case for surveillance costs, common equipment, and the cost of maintaining safe operating conditions on the site.

Due to mutualisation effects, dismantling a pair of reactors on the same site costs less than dismantling 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.

Series and mutualisation effects reduce the estimated decommissioning cost by 10% and 6% respectively compared to an estimate that ignores these effects. Series and mutualisation effects vary depending on the series: they are greater when

there are more units in a series (series effect) and more units on a site (mutualisation effect), leading to a combined effect (series and mutualisation effect) of over 16% for the 900MW series.

In particular, series and mutualisation effects explain why it is not appropriate simply to compare the average dismantling cost per reactor between the French fleet and other countries' nuclear fleets.

In contrast, the estimates 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 this approach resulted in a prudent estimation method.

For reasons of prudence, the estimate also includes an assessment of risks and uncertainties as follows:

- incorporation of uncertainties relating to each "elementary" block of costs, series effects, mutualisation effects, transposition coefficients and fleet expenses;
- incorporation of risks, corresponding to the completion risks (which are identifiable and quantifiable, but only contingent). These risks are currently being assessed in detail based on the initial 900MW unit (Fessenheim). Until the results are released, the financial impact of the risks and opportunities is included via a flat-rate increase.

The above method for assessing risks and uncertainties leads to an overall margin of some 16.5% for the whole fleet (20% for the first 900MW unit).

This approach, adopted in 2016, and its results were presented to the administrative authority and gave rise to further questions and discussions.

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 cost estimate would be reviewed annually. Reviews since 2017 have led to non-significant annual adjustments to this estimate.

EDF continues to confirm its analyses through an international intercomparison, taking care to identify and characterise a number of factors that could distort direct comparisons, for example differences in the scope concerned by the cost estimate, or national and regulatory contexts.

In 2020, in addition to reclassification of the amount concerning the Fessenheim plant to the provision for decommissioning of permanently shut-down plants, the following changes were made to the provisions for decommissioning of nuclear plants currently in operation:

- The scope of these provisions includes the cost of demolishing back-up diesel facilities used in the *Grand Carénage* programme in 2020, resulting in a €23 million increase in the provision;
- as explained in note 1.3.4.2, the final adoption of France's multi-year energy programme (PPE) in April 2020 led to recognition in the Group's financial statements of the impact of the two early reactor shutdowns to take place in 2027 and 2028 before their fifth ten-year inspection. Nuclear provisions were re-estimated based on various possible shutdown scenarios, resulting in a €32 million increase in these provisions (€26 million of which concerned provisions for decommissioning of nuclear plants in operation) via an adjustment to balance sheet assets, as announced in note 4.1 to the financial statements at 31 December 2019.
- following the reclassifications presented in note 15.1.1 to ensure consistency with the most recent official breakdown of nuclear expenses attached to the amended ministerial order of 21 March 2007 on secure financing of nuclear expenses, an amount of €813 million corresponding to the cost of interim storage and processing of steam generators in a centralised facility was reclassified to provisions for long-term radioactive waste management.

Based on the estimates of the different types of cost, the benchmark cost to completion (in 2020 euros) for decommissioning of the first two 900MW units (Fessenheim) amounts to approximately €0.8 billion, giving an average of €0.4 billion per initial 900MW unit, compared to an average cost of €0.35 billion for the entire PWR fleet, including the series and mutualisation effects described above.

For permanently shut-down nuclear power plants

Except for the two reactors at the Fessenheim plant (for which provisions are estimated under the approach used for the PWR fleet in operation described above), decommissioning of shut-down reactors involves pilot operations corresponding to four different technologies, each with clear specificities: a PWR reactor at Chooz A (but located in a cave), UNGG (natural uranium graphite gas-cooled) reactors at Bugey, Saint-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, unforeseeable and regulatory developments, and the latest available figures. They have been revised annually since 2015. 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 note 15.1.1.2.2 “Long-lived low-level waste”). 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 a higher estimated cost due to the induced operating charges.

Updating the industrial decommissioning scenario for permanently shut-down power plants, particularly UNGG plants, led to a €590 million increase in the provision at 31 December 2015.

The review of decommissioning provisions for permanently shut-down plants in 2016 led to non-significant adjustments, apart from one increase of €125 million for a specific installation (the Irradiated Materials Workshop at Chinon). In 2017 and 2018, this annual review gave rise to non-significant adjustments.

The amended industrial scenario for dismantling of the UNGG reactors in 2015 was presented to the ASN’s commissioners on 29 March 2016. In 2018 the ASN issued its main questions and conclusions about the UNGG strategy file. A consensus was reached regarding “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), but discussions continued regarding the dismantling timetable for the other 5 reactors. EDF’s proposed schedule allowed for significant experience-based adjustments (after dismantling the first reactor) before beginning almost simultaneous dismantling of the other 5 reactors. On 12 February 2019, EDF presented all the information justifying the Group’s chosen timetable to the ASN’s commissioners. The ASN then issued draft decisions that were submitted to public consultation between July and November 2019, setting the deadline for filing regulatory applications for authorisation of dismantling work, and the dismantling schedule to be included in the applications. In those draft decisions, the ASN acknowledged that the required operations are complex, and that EDF’s proposed risk control strategy (industrial demonstrator, significant experience with a first reactor) is justified. However, it asked for work on the five reactors after the first-of-a-kind reactor to be brought forward slightly and begin no later than 2055.

In view of the ASN’s draft decisions, the nuclear provisions were increased in 2019 by a total €108 million: €77 million for decommissioning provisions for permanently shut-down nuclear power plants and €31 million for provisions for long-term radioactive waste management (long-lived low-level waste, very low-level and low and medium-level waste).

The ASN’s decisions concerning dismantling of UNGG reactors were published on 17 March 2020 and did not contradict the principles of the draft decisions of 2019. Consequently, the nuclear provisions for decommissioning of UNGG plants were not subjected to any particular reestimation in 2020, and they reflect the best estimate of the industrial and technical scenario.

In 2020, the annual review of the cost estimates for decommissioning of permanently shut-down plants led to a €45 million increase in provisions due to critical path delays following suspension of work during France’s first lockdown phase, and a major unforeseen event associated with suspension of segmentation work on vessel internals at Chooz A. The costs for decontamination of civil engineering work were also updated, leading to a €43 million increase in provisions for the entire scope of permanently shut-down plants.

Finally, in accordance with its powers under article 594-4 of the Environment Code, in June 2020 the DGEC commissioned an external audit of the valuation of dismantling operations for EDF’s permanently shut-down nuclear facilities, conducted by a consortium of specialist firms. This audit began in December 2020 and will continue until July 2021.

At 31 December 2020, the gross amounts estimated under year-end economic conditions (amounts still to be spent) and the present value of those amounts are as follows, presented by type of reactor technology:

	31/12/2020	
(in millions of euros)	**Costs based on year-end economic conditions**	**Amounts in provisions at present value**
Pressurised water reactor - PWR - Chooz A	215	176
Pressurised water reactor - PWR – Fessenheim[(1)]	810	689
Natural uranium graphite gas-cooled reactors – UNGG - Bugey, Saint Laurent, Chinon	5,352	2,967
Heavy water reactor – Brennilis	321	276
Sodium-cooled fast neutron reactor – Superphenix at Creys Malville	557	494

[(1)] *excluding interim storage and processing of steam generators*

Provisions for decommissioning of permanently shut-down nuclear plants also cover dismantling costs for related facilities such as the APEC Fuel Storage Workshop at Creys-Malville and the BCOT Operational Hot Unit at Tricastin.

Compared to decommissioning costs for the PWR technology, the cost at completion (all costs both settled and remaining) for decommissioning of the other reactors is higher, to different extents depending on their specific characteristics:

- costs are around twice as high for Brennilis (completion cost of approximately €0.85 billion for one reactor) due to its compactness, the fact that the core is encased in concrete and thus difficult to access, the absence of a fuel pool, which complicates remote-controlled segmentation, and the presence of zircaloy (a fire hazard), meaning that segmentation work takes longer and must be more closely supervised;
- costs are around twice as high for UNGG reactors (completion cost of approximately €6.4 billion for six reactors), because they require removal of 20 times more material than a PWR due to their size, and contain graphite which is hard to access and requires special handling such that specific remote-controlled equipment must be developed;
- costs are around four times as high for Creys-Malville (completion cost of approximately €1.8 billion for one reactor), due to processing of sodium for which elimination is very sensitive, and the size of the facilities, especially the reactor (with a vessel 20 times bigger than the vessel of the 1300MW PWR).

The following progress has been made on decommissioning work:

- Chooz A: the reactor was shut down in 1991 and nuclear dismantling began in 2007 after the dismantling decree was issued. The final stage of dismantling began in 2016 and involves segmentation, conditioning and removal of reactor vessel internals, followed by dismantling of the vessel itself. These operations are due to be completed in 2024. The dismantling decree requires them to be followed by a period of surveillance of the runoff water from the cave for twenty years, meaning that declassification of the facility would occur in 2047;
- UNNG reactors: these six reactors were shut down between 1973 and 1994 and received their dismantling decrees between 2008 and 2010 (except for Chinon A1 and A2). Fuel removal and circuit draining have been completed for all these reactors, and dismantling operations are in process for the conventional and nuclear buildings in the periphery of the “reactor caissons”. Following the ASN’s decision of 2020, applications for dismantling permits will be submitted for all these reactors in 2022, to obtain new decrees allowing continuation of dismantling operations according to an “in-air” strategy. Opening of the top part of the first UNGG reactor caisson – Chinon A2 – is expected in 2033: the initial extractions of vessel internals and graphite blocks are due to start in 2040 and last 14 years. In parallel, the other UNGG sites are finalising their work to put the sites into a safe storage configuration (by 2035). A safe storage configuration state means that 80% of surfaces have been dismantled and the reactor caissons awaiting dismantling are safe: this will allow sufficient progress on the first reactor in this series to gain experience and ensure safety for the other five operations. Opening of the caissons after the first UNGG decommissioning is scheduled to take place in or after 2055;
- Creys Malville: this plant was shut down in 1998 and received its dismantling decree in 2006. The following key stages have been completed: removal of the fuel, dismantling of the machine room, drainage of the circuits, processing and elimination of the sodium used for cooling in all circuits, filling the reactor vessel, opening and extracting the vessel caps, and the start of dismantling of the core vessel cap (which weighs several hundred tonnes). The next stages are dismantling the vessel internals (due to be completed in 2026), electromechanical dismantling in the reactor building, then decontamination (dismantling should end in 2038);
- Brennilis: this plant was shut down in 1985 and received a partial dismantling decree in 2011 allowing dismantling of all installations peripheral to the "reactor block”. The following key stages have been completed: removal of the fuel, dismantling of the machine room, the fuel building, auxiliary buildings, heat exchangers and the effluent treatment station. The next stages are examination of the application for full dismantling authorisation, with a view to obtaining a dismantling decree in 2022 that would enable EDF to dismantle the reactor block (the end of these operations is currently forecast at 2040).

15.1.1.4 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 ("front-end" expenses);
- the cost of fuel processing, and waste removal and storage operations ("back-end" expenses). 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 provisions from the commissioning date and an asset associated with the provision is recognised. In a decision of 11 December 2020, France's Council of State challenged the tax-deductibility of the consequences of immediate recognition of a provision for dismantling of the last core ("front-end" last core expenses) (see note 17.3.1).

In 2020 after the Fessenheim plant was definitively shut down, €99 million of the provision for last cores, concerning the two reactors at Fessenheim, was reversed with a corresponding reduction in the inventories of non-irradiated fuel in the reactor at the time of the shutdown, and in parallel, provisions for spent fuel management and long-term radioactive waste management were recognised for the cost of processing this fuel and storage of the waste that will result.

15.1.1.5 Discount rate, inflation and sensitivity analyses

Calculation of the discount rate and inflation rate

Until 30 June 2020, the discount rate was based on the sliding 10-year average yield on French OAT 2055 treasury bonds which have a similar duration to the obligations, plus the spread of corporate bonds rated A to AA.

As of 31 December 2020, the methodologies used to determine the discount rate changed as follows:

The discount rate is now based on an interest rate curve, which comprises a sovereign yield curve constructed on year-end market data for liquid horizons (OAT bond 0-20 year curve) and then converging, using an interpolation curve, towards the very long-term rate UFR (Ultimate Forward Rate) - with yields that become close to the UFR after 50 years – plus a curve of the spread of corporate bonds rated A to BBB. Based on the disbursements expected to meet nuclear obligations, a single equivalent discount rate is deduced by applying the discount rates from the interest rate curve constructed in this way to each flow as appropriate to its maturity. This single discount rate is then applied to the forecast disbursement schedules for the costs of the obligations, to determine the provisions.

The UFR was defined by the European Insurance and Occupational Pensions Authority (EIOPA) for very long-term insurance liabilities that will involve disbursements beyond market horizons. The UFR calculated for 2020 is 3.51%. This is used in the calculation methodology, in compliance with the decision by the French authorities, which in the ministerial order of 1 July 2020 amending the order of 21 March 2007 on secure financing of nuclear expenses (see below) changed the formula of the regulatory ceiling for the discount rate, such that it now refers to the UFR instead of the arithmetic 48-month average of the TEC 30-year rate. The UFR is considered more relevant for nuclear provisions in view of the very long-term maturities. The sovereign yield curve indicates rates in a range of [-0.6%;0.2%] for outflows between 0 and 20 years, [0.2% ;3.2%] for outflows between 20 and 50 years, and a rate moving towards 3.51% for outflows after 50 years.

This change in calculation methodology for the discount rate provides the best assessment of the time value of money with regard to nuclear provisions, which are characterised by very long-term disbursement outflows, well beyond market horizons. This assessment is largely achieved through:

- use of an interest rate curve based on observed year-end market data with liquid horizons, converging over non-liquid horizons towards a very long-term rate with no cycle effect (instead of an average rate concerning a single duration corresponding to the average duration of the obligations), i.e. yield data for all the maturities associated with nuclear provisions;
- use of a very long-term rate (calculated UFR) produced by an independent body and now adopted by the French authorities in setting the formula for regulatory ceiling, to take account of long trends in yield movements, in coherence with the distant disbursement horizon;
- a change in the references of the bond spread to include corporate bonds rated A to BBB by ratings agencies, in order to construct a robust spread curve since there are few AA-rated bonds, particularly on long maturities, whereas most "Investment Grade" bonds are BBB-rated bonds and the great majority of them have longer maturities.

The inflation assumption is based on an inflation curve constructed by reference to inflation-indexed market products and economic forecasts, in long-term coherence with the inflation assumption underlying the UFR (2%).

The discount rate determined is thus 3.3% at 31 December 2020, assuming inflation of 1.2% (3.7% and 1.4% respectively at 31 December 2019), giving a real discount rate of 2.1% at 31 December 2020 (2.3% at 31 December 2019).

Based on the calculation method used until 30 June 2020, the real discount rate would also be 2.1%.

Regulatory discount rate limit

Following the letter dated 12 February 2020 from the Minister for the Ecological and Inclusive Transition and the Minister of the Economy and Finance informing EDF of their decisions to change certain regulations regarding secure financing of nuclear expenses (see note 32.1.5.1 to the financial statements at 31 December 2019), the following were published in the *Journal Official* of 2 July 2020:

- the decree of 1 July 2020 on secure financing for nuclear expenses, codifying and updating the initial decree of 23 February 2017;
- the ministerial order of 1 July 2020 on secure financing for nuclear expenses, amending the initial ministerial order of 21 March 2007.

This decree and ministerial order require the discount rate to comply with two regulatory limits from 1 July 2020. It must be lower than:

- a regulatory maximum, now expressed in real value, i.e. net of inflation; this value is equal to the unrounded value representative of expectations concerning the real long-term interest rate, as used for the calculation of the Ultimate Forward Rate (UFR) applicable at the date concerned published by the European Insurance and Occupational Pensions Authority (EIOPA), plus 150 bp. This maximum is applicable from 2024. Until 2024, the maximum is the weighted average of 2.3% and the above calculation. The weighting applied to the 2.3% rate is set at 50% for 2020, 25% for 2021, 12.5% for 2022 and 6.25% for 2023;
- and the expected rate of return on assets covering the liability (dedicated assets).

The maximum discount rate under the new ministerial order effective from 1 July 2020, calculated by reference to the UFR, is 2.7% (real rate of 2.66% rounded up to 2.7%) at 31 December 2020.

The real discount rate used in the financial statements at 31 December 2020, in application of the methodologies presented above, is 2.1%.

The maximum discount rate in nominal value, based on the regulation applicable before the ministerial order of 1 July 2020 and calculated by reference to TEC 30 rates, was 3.8% (3.75% rounded up to 3.8%) at 31 December 2019. The nominal discount rate used in the financial statements at 31 December 2019 was 3.7%.

The decree of 1 July 2020 also introduced the following additional changes:

- it removed the obligation to add to dedicated assets when the coverage rate of obligations is above 100%, and raised the threshold above which withdrawals can be made from dedicated assets from 110% to 120%;
- it extended the period for making additions to dedicated assets in the event of a shortfall in coverage, after approval by the administrative authority, to 5 years compared to 3 previously;
- it added requirements for internal control and risk analysis on nuclear provisions, which operators must implement by 31 December 2021.

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.

Provisions related to nuclear generation within the scope of the Law of 28 June 2006	**31/12/2020**		**31/12/2019**	
(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	18,998	10,246	18,437	9,804
- amount unrelated to the operating cycle	*2,727*	*1,297*	*2,491*	*1,152*
Waste removal and conditioning	-	-	1,243	805
Long-term radioactive waste management	35,580	13,300	32,372	10,531
BACK-END NUCLEAR CYCLE EXPENSES	**54,578**	**23,546**	**52,052**	**21,140**
Decommissioning of nuclear plants in operation	19,693	12,775	21,134	13,244
Decommissioning of shut-down nuclear plants	7,400	4,714	6,428	3,693
Last cores	4,258	2,711	4,331	2,624
DECOMMISSIONING AND LAST CORE EXPENSES	**31,351**	**20,200**	**31,893**	**19,561**
PROVISIONS RELATED TO NUCLEAR GENERATION within the scope of the law of 28 June 2006		***43,746***		***40 701***

The cumulative disbursements of nuclear expenses (based on gross values at year-end economic conditions) are distributed as follows:

Provisions related to nuclear generation within the scope of the Law of 28 June 2006	31/12/2020		
	Costs based on year-end economic conditions		
(in millions of euros)	Disbursement expected within 10 years	Disbursement expected after 10 years[1]	Total
Spent fuel management	7,176	11,822	**18,998**
- amount unrelated to the operating cycle	*239*	*2,488*	***2,727***
Long-term radioactive waste management	5,094	30,486	**35,580**
BACK-END NUCLEAR CYCLE EXPENSES	**12,270**	**42,308**	**54,578**
Decommissioning of nuclear plants in operation	707	18,986	**19,693**
Decommissioning of shut-down nuclear plants	2,756	4,644	**7,400**
Last cores	848	3,410	**4,258**
DECOMMISSIONING AND LAST CORE EXPENSES	**4,311**	**27,040**	**31,351**

[1]Over a 20-year and 50-year horizon, 22% and 40% respectively of cumulative disbursements (at year-end economic conditions) will concern long-term radioactive waste management provisions, and 47% and 96% respectively will concern decommissioning provisions.

This approach can be complemented by estimating the impact of a change in the discount rate on the present value.

The following table reports these details for the main components of EDF's provisions for the back-end of the nuclear cycle, decommissioning of nuclear plants and last cores:

At 31 December 2020

	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	11,322	(261)	287	229	(253)
- waste removal and conditioning	-				
- long-term radioactive waste management	13,300	(793)	954	646	(796)
Decommissioning and last core expenses:					
- decommissioning of nuclear plants in operation	12,775	(498)	522	-	-
- decommissioning of shut-down nuclear plants	4,714	(160)	172	160	(172)
- last cores	2,711	(91)	97	-	-
TOTAL	**44,822**	**(1,803)**	**2,032**	**1,035**	**(1,221)**
Amount covered by dedicated assets	***32,676***	***(1,564)***	***1,772***	***875***	***(1,043)***

At 31 December 2019

(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	10,823	(228)	249	196	(215)
- waste removal and conditioning	805	(25)	27	16	(17)
- long-term radioactive waste management	10,531	(659)	750	554	(636)
Decommissioning and last core expenses:					
- decommissioning of nuclear plants in operation	13,244	(506)	529	7	(7)
- decommissioning of shut-down nuclear plants	3,693	(139)	150	139	(150)
- last cores	2,624	(88)	94	-	-
TOTAL	**41,720**	**(1,645)**	**1,799**	**912**	**(1,025)**
Amount covered by dedicated assets	***29,975***	***(1,423)***	***1,559***	***769***	***(868)***

15.1.2 EDF's dedicated assets

15.1.2.1 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 in France's Environment Code.

The Decree of 1 July 2020 codified the regulatory obligations concerning dedicated assets in articles D594-1 to 18 of the Environment Code, complemented by the ministerial order of 21 March 2007 amended by the order of 1 July 2020. These documents define the list of eligible assets, which is largely based on France's Insurance Code and includes unlisted assets subject to certain conditions. In particular, they authorise allocation to dedicated assets of the shares of CTE, which has held 100% of the capital of RTE since 31 December 2017 (see note 15.1.2.2 below).

EDF 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).

Since the decree of 1 July 2020, apart from the obligation to allocate €797 million to dedicated assets in 2020 as a result of the previous regulations, which was confirmed to EDF by a letter from the administrative authority on 12 February 2020, EDF is no longer obliged to add to dedicated assets when the coverage rate of obligations, determined by the ratio of the assets' realisable value to the amount of the provisions concerned, is above 100%, and withdrawals from assets are not authorised unless that rate is above 120%.

15.1.2.2 Strategic allocation and composition of dedicated assets

Given the regulations governing dedicated assets, they form 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.

Several changes have been made to this strategic allocation, in order to pursue the diversification into unlisted assets:

- in 2010 the shares in RTE (now held via CTE) were allocated to dedicated assets;
- in 2013 an unlisted asset portfolio (consisting of infrastructures, real estate and debt or equity funds) was set up and is managed by EDF SA's "EDF Invest" division; and

- in 2013 the receivable recognised by the French State was allocated to dedicated assets. This receivable represented the accumulated shortfall in CSPE financing at 31 December 2012, and was fully reimbursed at 31 December 2020.

On 29 June 2018 the Board of Directors validated the principle of strategic allocation for dedicated assets:

- Yield assets (target of 30% of dedicated assets), consisting of infrastructure assets, including the shares of CTE, and real estate property;
- Growth assets (target of 40% of dedicated assets), consisting of equity funds investing in listed or unlisted equities;
- Fixed-income assets (target of 30% of dedicated assets), consisting of listed bonds or listed bond funds, unlisted debt funds, receivables and cash.

These targets should be reached gradually by 2025.

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 located in France, established for the company. The reserved funds are owned by EDF and are not consolidated as EDF does not participate in management of these funds and provides no financial support for them.

The value of the assets of the reserved investment funds amounts to €10,422 million at 31 December 2020 (€8,492 million at 31 December 2019). These funds mainly consist of 13 listed funds with total value of €9,742 million (at 31 December 2019, 12 listed funds with total value of €7,875 million).

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.

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 yield assets below).

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).

Yield assets

The yield assets managed by EDF Invest consist mainly of assets related to investments in infrastructures and real estate, made either directly by EDF Invest or by investment funds under delegated management arrangements.

Through unlisted investment funds, EDF Invest also manages growth assets and fixed-income assets.

At 31 December 2020, the assets managed by EDF Invest represent a total realisable value of €6,905 million, including €6,420 million of yield assets. Yield assets particularly include:

- 50.1% of the Group's shares in CTE, amounting to €2,788 million at 31 December 2020 (€2,926 million at 31 December 2019), presented in investments in associates in the consolidated balance sheet;
- the Group's investments in Madrileña Red de Gas (MRG), Géosel, Thyssengas, Aéroports de la Côte d'Azur, Energy Assets Group, Central Sicaf, Ecowest, Korian & Partenaires Immobilier, Nam Theun Power Company and companies that own wind and solar power plants (in the United States, Canada, United Kingdom, Portugal), presented in investments in associates in the consolidated balance sheet;
- the Group's investments in Teréga, Porterbrook, Autostrade per l'Italia, Q-Park and companies that own wind farms in the United Kingdom, presented in debt and equity securities in the consolidated balance sheet.

15.1.2.3 Changes in dedicated assets in 2020

In April 2020, EDF Invest acquired a minority interest in Energy Assets Group (EAG) in the United Kingdom (smart meters), and minority interests in real estate assets (office in France and healthcare properties in Europe).

In December 2020 EDF SA acquired investments in wind and solar power plants in the United States, Canada and Portugal from EDF Renewables. All these investments were allocated to dedicated assets in 2020, in addition to the allocation during the first half-year corresponding to the balance of the investment in the MiRose and Red Pine wind farms acquired

from EDF Renewables in 2019.

Allocations to dedicated assets in 2020 totalled €797 million (€540 million in 2019), comprising €299 million in the form of asset contributions and €498 million in cash, in compliance with EDF's obligation for 2020 under the regulatory framework (see note 15.1.2.1).

The first half of 2020 saw an unprecedented situation on the financial markets. The equity markets rose significantly until mid-February, then the spread of the Covid-19 pandemic drew them into their sharpest downturn in more than 30 years. The lowest point was on 20 March but ultimately there was a strong recovery until the end of the half-year, largely stimulated urgent intervention by the central banks. Over this first half-year the portfolio registered negative changes in fair value, but the situation gradually improved and the year 2020 ended with good performances for all assets – particularly thanks to the exceptional budget and monetary measures taken to support the economy.

The US Federal Bank once again adopted a zero-rate policy, and the ECB introduced a quantitative easing programme on an unprecedented scale, involving assets of much lower quality than in previous quantitative easing campaigns. Consequently, contrary to expectations in the early part of the year, government bond yields declined significantly (-0.4% on the Bund 10-year yield to -0.58%, and -0.9% on BTP Italian government bonds to +0.52%). The year ended on a positive note as political uncertainties were lifted with the US Presidential elections, and most importantly a last-minute deal for Brexit.

Positive changes in the fair value of the dedicated asset portfolio (investment funds, equities) amounting to €1,218 million were recognised in the financial result in 2020 (see note 8.3), compared to positive changes amounting to €2,545 million in 2019.

Positive changes in the fair value of the bonds in the dedicated asset portfolio amounting to €62 million were recognised in OCI in 2020 (see note 18.1.2), compared to positive changes amounting to €162 million in 2019.

Withdrawals from dedicated assets in 2020 totalled €431 million, equivalent to payments made in respect of the long-term nuclear obligations to be covered during the year (€442 million in 2019).

15.1.2.4 Valuation of EDF's dedicated assets

EDF's dedicated assets are included in the Group's consolidated financial statements at the following values:

(in millions of euros)	Consolidated balance sheet presentation	31/12/2020		31/12/2019	
		Book value	Realisable value	Book value	Realisable value
Yield assets (EDF Invest)		**4,677**	**6,420**	**4,304**	**6,080**
CTE	Investments in associates[(1)]	1,378	2,788	1,417	2,926
Other associates	Investments in associates[(2)]	1,974	2,252	1,563	1,777
Other unlisted assets	Debt and equity securities and other net assets[(3)]	1,309	1,364	1,334	1,387
Derivatives	Fair value of derivatives	16	16	(10)	(10)
Growth assets		**13,692**	**13,692**	**13,300**	**13,300**
Equities (investment funds)	Debt securities	13,174	13,174	12,978	12,978
Unlisted equity funds (EDF Invest)	Debt securities	330	330	276	276
Derivatives	Fair value of derivatives	188	188	46	46
Fixed-income assets		**13,736**	**13,736**	**12,240**	**12,244**
Bonds	Debt securities	12,371	12,371	11,225	11,225
Unlisted debt funds (EDF Invest)	Debt securities	155	155	142	142
Cash portfolio	Debt securities	1,185	1,185	188	188
CSPE receivable[(4)]	Loans and financial receivables	-	-	684	688
Derivatives	Fair value of derivatives	25	25	1	1
TOTAL EDF DEDICATED ASSETS		**32,105**	**33,848**	**29,844**	**31,624**

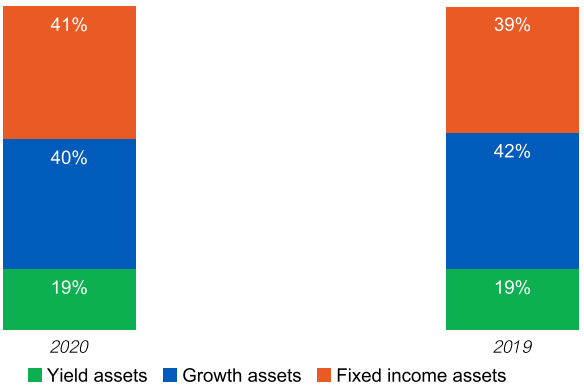
[(1)] The Group's investment of 50.1% of CTE, the company that holds 100% of the shares in RTE. The CTE shares are included at their equity value in the consolidated financial statements (book value in the table). The realisable value of CTE in the above table has been determined by an independent assessor, in the same way as for EDF Invest's other assets.

[(2)] Including the value of the share in equity of the controlled companies owning these investments.

[(3)] Including debt and equity securities amounting to €1,183 million and the value of the share in equity of other controlled companies.

[(4)] 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. This receivable was fully reimbursed at 31 December 2020 in line with the repayment schedule.

The structure of the dedicated asset portfolio in 2020 and 2019 is as follows (in realisable value):



15.1.3 Coverage of EDF's long-term nuclear obligations

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)	31/12/2020	31/12/2019
Provisions for spent fuel management – portion unrelated to the operating cycle as defined in the regulations	1,297	1,152
Provisions for long-term radioactive waste management	13,300	10,531
Provisions for waste removal and conditioning	-	805
Provisions for nuclear plant decommissioning	17,489	16,937
Provisions for last cores – portion for future long-term radioactive waste management	590	550
PRESENT COST OF LONG-TERM NUCLEAR OBLIGATIONS	**32,676**	**29,975**
REALISABLE VALUE OF DEDICATED ASSETS	**33,848**	**31,624**
REGULATORY COVERAGE RATE	**103.6%**	**105.5%**

At 31 December 2020, by the regulatory calculations provisions are 103.6% covered by dedicated assets. The regulatory caps on the realisable value of certain investments set in the Environment Code were respected at 31 December 2020.

At 31 December 2019, by the regulatory calculations provisions were 105.5% covered by dedicated assets and also respected these regulatory caps on realisable value.

15.2 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 €15,280 million at 31 December 2020;
- 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 18.1.3) at the amount of €13,034 million at 31 December 2020 (€13,303 million at 31 December 2019).

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)	31/12/2019	Increases	Decreases	Discount effect	Translation adjustments	Other movements	31/12/2020
Provisions for spent fuel management	1,503	14	(206)	34	(79)	20	1,286
Provisions for waste removal and conditioning	532	3	-	10	(29)	30	546
Provisions for long-term radioactive waste management	1,053	3	-	53	(58)	55	1,106
Provisions for the back-end of the nuclear cycle	**3,088**	**20**	**(206)**	**97**	**(166)**	**105**	**2,938**
Provisions for nuclear plant decommissioning	10,303	-	(48)	168	(557)	304	10,170
Provisions for last cores	1,892	-	-	71	(106)	315	2,172
Provisions for decommissioning and last cores	**12,195**	**-**	**(48)**	**239**	**(663)**	**619**	**12,342**
PROVISIONS RELATED TO NUCLEAR GENERATION	**15,283**	**20**	**(254)**	**336**	**(829)**	**724**	**15,280**

Other movements include the changes in nuclear liabilities with a corresponding adjustment in the amount of reimbursements receivable from the Nuclear Liabilities Fund (NLF) and the British government, and the change in the provision for last cores via an adjustment to fixed assets.

The overall change mainly results from the decrease in the discount rate for an amount of €644 million, of which €322 million was recognised through the receivable representing reimbursements to be made by the Nuclear Liabilities Fund (NLF) and the British government, and €322 million recognised via an adjustment to fixed assets.

15.2.1 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. These agreements were amended and restated on 5 January 2009 as part of the acquisition of the British Energy Generation Limited by the Group. 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 €101 million at 31 December 2020;
- £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 13.1).

EDF Energy has been in discussions since 2019 with the UK government to agree changes and clarifications to the Restructuring Agreements to provide for efficient recovery of qualifying costs and clarity that once the AGR stations have finished defueling, they will transfer to the Nuclear Decommissioning Authority (NDA) for subsequent decommissioning activities.

EDF Energy in early 2020 submitted phase 1 of the decommissioning plan submission (DPS 20) which was an update to the defueling liability. The NDA response to the DPS 20 is expected as part of the conclusion in the discussions with the UK government.

The second phase of the DPS 20 should take place late 2021, it will involve updates of all the other decommissioning activities for the AGR plants and decommissioning of Sizewell. At the same time, there will also be an update to the uncontracted liability discharge plan.

15.2.2 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.

	31/12/2020		31/12/2019	
(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	2,318	1,286	2,655	1,503
Waste removal and conditioning	1,875	546	1,979	532
Long-term radioactive waste management	3,724	1,106	3,886	1,053
BACK-END NUCLEAR CYCLE EXPENSES	**7,917**	**2,938**	**8,520**	**3,088**

15.2.3 Provisions for nuclear plant decommissioning

Provisions for decommissioning of nuclear plants result from the Group 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.

As explained above, EDF Energy has been in discussions since 2019 with the UK government to agree changes and clarifications to the Restructuring Agreements, to provide for efficient recovery of qualifying costs and clarity that once the AGR stations have finished defueling, they will transfer to the Nuclear Decommissioning Authority (NDA) for subsequent decommissioning activities.

In early 2020, EDF Energy submitted phase 1 of the decommissioning plan submission (DPS 20) which was an update to the defueling liability. This led to a €1.9 billion increase in the provision at 31 December 2019, notably reflecting i) the extension of the defueling period following risk and contingency modelling, ii) better definition of the costs covered, and iii) an updated estimate of the costs of preparing and removing fuel, following a review of the industrial scenario. The NDA's response to the DPS 20 is expected as part of the conclusion in the discussions with the UK government.

The second phase of the DPS 20 should take place late 2021, and will involve updates of all the other decommissioning activities for the AGR plants and decommissioning of Sizewell. At the same time, there will also be an update to the uncontracted liability discharge plan.

During 2020, EDF Energy announced the closure of Hunterston and Hinkley Point B AGR stations, to take place no later than 7 January 2022 and 15 July 2022 respectively. The impact of this assumption update is immaterial in the context of the decommissioning liability.

(in millions of euros)	31/12/2020		31/12/2019	
	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	18,175	10,069	19,278	10,187

The decrease in the costs based on year-end economic conditions is mainly explained by the effect of translation adjustments.

15.2.4 Discounting of EDF Energy's provisions related to nuclear generation

Until 30 June 2020, the discount rate was 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).

As of 31 December 2020, the method used to determine the discount rate changed as follows:

- Like the discount rate for nuclear provisions in France, the discount rate for EDF Energy's provisions is now based on an interest rate curve, which comprises a sovereign yield curve constructed on year-end market data for liquid horizons (UK gilt 0-20 year yield) and then converging, using an interpolation curve, towards the very long-term rate UFR (Ultimate Forward Rate) plus a curve of the spread of corporate bonds rated A to BBB. Based on expected disbursements corresponding to nuclear obligations, a single equivalent discount rate is deduced from the curve constructed in this way. This single discount rate is then applied to the forecast disbursement schedules for the costs of the obligations, to determine the provisions.
- The inflation assumption is based on an inflation curve constructed by reference to economic forecasts and inflation-indexed market products, in long-term coherence with the inflation assumption underlying the UFR (2%).

The real discount rate determined in this way and applied by EDF Energy at 31 December 2020 for calculation of its nuclear obligations is 1.8% (2.0% at 31 December 2019).

15.3 NUCLEAR PROVISIONS IN BELGIUM

In Belgium, the Belgian law of 11 April 2003 assigned management of provisions concerning the Belgian nuclear plants, and the funds that cover them, to Synatom (a subsidiary of the ENGIE group). Luminus contributes via Synatom to these funds, to cover its share of plant decommissioning and back-end nuclear fuel expenses as a co-owner of 4 nuclear plants. These funding mechanisms are reflected through the following items in the consolidated financial statements:

- obligations presented in the liabilities in the form of provisions, amounting to €265 million at 31 December 2020 (€259 million at 31 December 2019);
- a receivable representing the advance payments made to Synatom, recognised in the consolidated balance sheet assets as financial assets carried at fair value (see note 18.1.3) at the value of €263 million at 31 December 2020 (€230 million at 31 December 2019). This receivable, which corresponds to the fair value of the share of funds held by Synatom on behalf of Luminus, is discounted by applying the same real discount rate used to determine the obligations they will cover.

Other provisions related to nuclear generation in Belgium correspond to liabilities covered by provisions that are not part of the mechanisms described above.

NOTE 16 PROVISIONS FOR EMPLOYEE BENEFITS

Accounting principles and methods

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.

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 and any return on hedging assets in excess of the discount rates used,
  - the effect of the limitation to the asset ceiling if any.

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.

French entities covered by the IEG system

Entities belonging to the specific IEG (electricity and gas) sector system, namely EDF, Enedis, 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.

After the financing reform for the IEG sector system took effect on 1 January 2005 (law of 9 August 2004), pension provisions were recognised by IEG companies 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 the system affiliation 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.

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.

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.

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;
- long-service awards;
- specific benefits for employees who have been in contact with asbestos.

16.1 GROUP PROVISIONS FOR EMPLOYEE BENEFITS

(in millions of euros)	31/12/2020	31/12/2019
Provisions for employee benefits – current portion	879	945
Provisions for employee benefits – non-current portion	22,130	20,539
PROVISIONS FOR EMPLOYEE BENEFITS	**23,009**	**21,484**

16.1.1 Breakdown of the change in the provision by geographical area: obligations, fund assets, net liability

(in millions of euros)	France[1]	United Kingdom	Others	Total
Obligations at 31/12/2019	**33,310**	**9,690**	**899**	**43,899**
Net expense for 2020	1,241	456	39	1,736
Actuarial gains and losses	2,356	896	41	3,293
Employer's contributions to funds	-	-	-	-
Employees' contributions to funds	-	9	-	9
Benefits paid[2]	(1,418)	(404)	(25)	(1,847)
Translation adjustment	-	(530)	(2)	(532)
Other movements	-	-	-	-
Obligations at 31/12/2020	**35,489**	**10,117**	**952**	**46,558**

(in millions of euros)	France[1]	United Kingdom	Others	Total
Fund assets at 31/12/2019	**(12,581)**	**(10,712)**	**(368)**	**(23,661)**
Net expense for 2020	(160)	(215)	(3)	(378)
Actuarial gains and losses	(1,204)	(1,179)	(7)	(2,390)
Employer's contributions to funds	-	(283)	(25)	(308)
Employees' contributions to funds	-	(9)	-	(9)
Benefits paid	475	404	4	883
Translation adjustment	-	588	1	589
Fund assets at 31/12/2020	**(13,470)**	**(11,406)**	**(398)**	**(25,274)**

(in millions of euros)	France[1]	United Kingdom	Others	Total
Net employee benefit liability at 31/12/2019[2]	**20,729**	**(1,022)**	**531**	**20,238**
Net expense for 2020	1,081	241	36	1,358
Actuarial gains and losses	1,152	(283)	34	903
Employer's contributions to funds	-	(283)	(25)	(308)
Employees' contributions to funds	-	-	-	-
Benefits paid	(943)	-	(21)	(964)
Translation adjustment	-	58	(1)	57
Other movements	-	-	-	-
Net employee benefit liability at 31/12/2020	**22,019**	**(1,289)**	**554**	**21,284**
Including:				
Provisions for employee benefits				*23,009*
Non-current financial assets[3]				*(1,725)*

[1] France comprises the two operating segments "France – Generation and Supply" and "France – Regulated activities" (see note 16.2).
[2] The net liability at 31 December 2019 comprised €21,484 million for the provisions for employee benefits and €(1,246) million of non-current financial assets, giving a net liability amount of €20,238 million.
[3] At 31 December 2020, EDF Energy recognised surplus funding on its EEGSG and BEGG pension schemes.

Actuarial gains and losses on obligations in 2020

Actuarial gains and losses on obligations amount to €3,293 million for 2020, including:

- €2,356 million in France as a result of:
  - the €2,695 million change in the discount rate;
  - the €(604) million change in the inflation rate;
- €896 million in the United Kingdom, essentially associated with changes in the discount and inflation rates (see note 16.1.2).

Actuarial gains and losses on obligations amount to €5,130 million for 2019, including:

- €4,151 million in France as a result of:
  - the €5,515 million change in the discount rate;
  - the €(926) million change in the inflation rate;
  - €(285) million due to the proposed law on social security system funding for 2020;
  - €(183) million due to an update of the wage law;
- €873 million in the United Kingdom, essentially associated with changes in the discount and inflation rates.

Actuarial gains and losses on fund assets in 2020

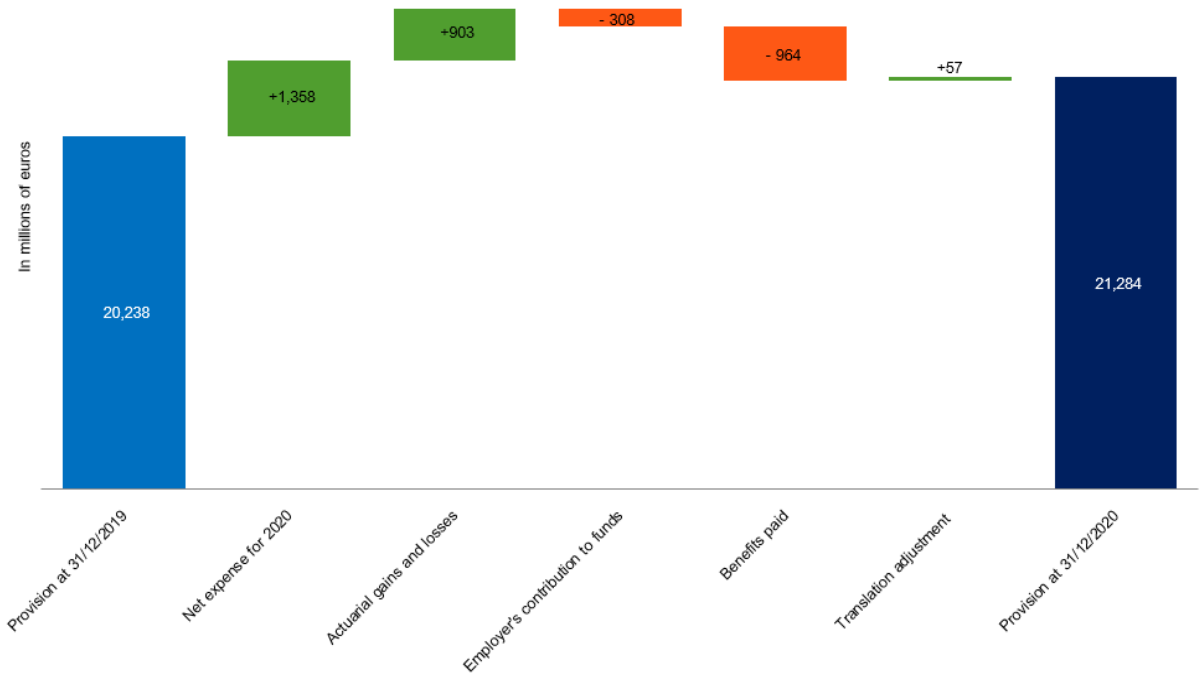
Actuarial gains and losses on fund assets amount to €(2,390) million for 2020. They mainly result from a €(1,179) million change in the United Kingdom and a €(1,204) million change in France due to a very good performance on the bond markets.

Net employee benefit liability at 31 December 2020

The net liability at 31 December 2020 amounted to €21,284 million, including:

- €22,019 million in France;
- €(1,289) million in the United Kingdom, reflecting:
  - recognition by EDF Energy of surplus funding on its EEGSG and BEGG pension schemes (as explained in the accounting principles and methods below), totalling €1,725 million compared to €1,246 million at 31 December 2019. This surplus funding, which increased due to the good performance by fund assets, is recognised in balance sheet assets under “non-current financial assets",
  - recognition by EDF Energy of a €436 million provision in respect of its EEPS pension scheme at 31 December 2020, compared to €224 million at 31 December 2019.

Changes in the net liability in 2020 were as follows:



16.1.2 Actuarial assumptions and sensitivity analyses

The following actuarial assumptions are used:

	France		United Kingdom	
(in %)	31/12/2020	31/12/2019	31/12/2020	31/12/2019
Discount rate/rate of return on assets[1]	0.90%	1.30%	1.45%	2.11%
Inflation rate	1.20%	1.30%	2.53%	2.89%
Wage increase rate[2]	2.30%	2.40%	2.37%	2.28%

[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 of appropriate 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. The decrease in the discount rate essentially relates to the decrease in risk-free rates observed over 2020.

Changes in the economic and market parameters used have led the Group to set the discount rate at 0.90% at 31 December 2020 (1.30% at 31 December 2019).

The inflation assumption is based on an inflation curve constructed from economic forecasts and inflation-indexed market products.

As a result of changes in the economic and market parameters, the assumed average inflation rate used as the Group's benchmark for Euro zone countries is 1.2% at 31 December 2020 (1.3% at 31 December 2019).

The wage law used to calculate obligations refers to wage increases observed over the period 2015-2018 (adjusted for non-recurring effects).

The mortality table used to calculate obligations is based on the INSEE 2013-2070 generation table (produced by the French statistics office), corrected for differences in mortality between the general French population and the population covered by the IEG regime.

In the United Kingdom, the discount rate used for employee benefit obligations is determined by applying the yield rate on high-quality corporate bonds of appropriate duration to maturities corresponding to the future disbursements resulting from these obligations.

Sensitivity analyses on the amount of the obligations are as follows:

	31/12/2020	
(in %)	France	United Kingdom
Impact of a 25bp increase or decrease in the discount rate	-5.0% / +5.4%	-5.4% / +6.0%
Impact of a 25bp increase or decrease in the inflation rate	+5.1% / -4.7%	+5.4% / -4.3%
Impact of a 25bp increase or decrease in the wage increase rate	+4.9% / -4.6%	+0.3% / -0.1%

16.1.3 Breakdown by geographical area of post-employment and other long-term employee benefits

(in millions of euros)	2020			
	France	United Kingdom	Other	Total
Current service cost	(663)	(262)	(28)	(953)
Past service cost	-	-	-	0
Actuarial gains and losses – other long-term benefits	(146)	-	-	(146)
Net expenses recorded as operating expenses	**(809)**	**(262)**	**(28)**	**(1,099)**
Interest expense (discount effect)	(432)	(194)	(11)	(637)
Return on fund assets	160	215	3	378
Net interest expense included in financial result	**(272)**	**21**	**(8)**	**(259)**
EMPLOYEE BENEFIT EXPENSES RECORDED IN THE INCOME STATEMENT	**(1,081)**	**(241)**	**(36)**	**(1,358)**
Actuarial gains and losses – post-employment benefits	(2,356)	(896)	(41)	(3,293)
Actuarial gains and losses on fund assets	1,204	1,179	7	2,390
Actuarial gains and losses	**(1,152)**	**283**	**(35)**	**(903)**
Translation adjustments	**-**	**(58)**	**1**	**(57)**
GAINS AND LOSSES ON EMPLOYEE BENEFITS RECORDED DIRECTLY IN EQUITY	**(1,152)**	**225**	**(34)**	**(960)**

(in millions of euros)	2019			
	France	United Kingdom	Other	Total
Current service cost	(563)	(230)	(28)	(821)
Past service cost	-	-	3	3
Actuarial gains and losses – other long-term benefits	(205)	-	-	(205)
Net expenses recorded as operating expenses	**(768)**	**(230)**	**(25)**	**(1,023)**
Interest expense (discount effect)	(668)	(243)	(20)	(931)
Return on fund assets	252	263	8	523
Net interest expense included in financial result	**(416)**	**20**	**(12)**	**(408)**
EMPLOYEE BENEFIT EXPENSES RECORDED IN THE INCOME STATEMENT	**(1,184)**	**(210)**	**(37)**	**(1,431)**
Actuarial gains and losses – post-employment benefits	(4,151)	(873)	(106)	(5,130)
Actuarial gains and losses on fund assets	1,647	998	23	2,668
Actuarial gains and losses	**(2,504)**	**125**	**(83)**	**(2,462)**
Translation adjustments	**-**	**47**	**(1)**	**46**
GAINS AND LOSSES ON EMPLOYEE BENEFITS RECORDED DIRECTLY IN EQUITY	**(2,504)**	**172**	**(84)**	**(2,416)**

In 2020, actuarial gains and losses on post-employment benefits and other long-term employee benefits amount to €(3,439) million (€(146) million for long-term employee benefits and €(3,293) million for post-employment benefit obligations), including:

- €(896) million in the United Kingdom;
- €(2,502) million in France (€(146) million for long-term employee benefits and €(2,356) million for post-employment benefit obligations). These actuarial gains and losses relate to changes in the discount rate, the inflation rate and experience adjustments (see note 16.1.2).

The actuarial gains and losses on obligations generated over 2019 amount to €(4,356) million in France and are mainly associated with changes in the discount rate, the inflation rate, the proposed law on social security system funding for 2020 and the updating of the wage law.

(in millions of euros)	2020	2019
Experience adjustments	(355)	(95)
Changes in demographic assumptions	-	(1)
Changes in financial assumptions [1]	(2,147)	(4,260)
ACTUARIAL GAINS AND LOSSES ON OBLIGATIONS	**(2,502)**	**(4,356)**
Including:		
Actuarial gains and losses on post-employment benefits	*(2,356)*	*(4,151)*
Actuarial gains and losses on other long-term benefits	*(146)*	*(205)*

[1]Financial assumptions mainly concern the discount rate, inflation rate and wage increase rate.

16.2 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 4.1) 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.

16.2.1 Breakdown of obligations by type of beneficiary

(in millions of euros)	31/12/2020	31/12/2019
Current employees	20,477	18,994
Retirees	15,012	14,316
OBLIGATIONS	**35,489**	**33,310**

16.2.2 Provision for employee benefits by nature

At 31 December 2020

(in millions of euros)	Obligations	Fund assets	Provisions in the balance sheet
Provisions for post-employment benefits at 31/12/2020	**33,893**	**(13,470)**	**20,423**
Including:			
Pensions	25,951	(12,671)	13,280
Benefits in kind (electricity/gas)	5,294	-	5,294
Retirement gratuities	941	(784)	157
Other	1,707	(15)	1,692
Provisions for other long-term employee benefits at 31/12/2020	**1,596**	**-**	**1,596**
Including:			
Annuities following work-related accident and illness, and invalidity	1,339	-	1,339
Long service awards	225	-	225
Other	32	-	32
PROVISIONS FOR EMPLOYEE BENEFITS AT 31/12/2020	**35,489**	**(13,470)**	**22,019**

At 31 December 2019

(in millions of euros)	Obligations	Fund assets	Provisions in the balance sheet
Provisions for post-employment benefits at 31/12/2019	**31,776**	**(12,581)**	**19,195**
Including:			
Pensions	24,463	(11,778)	12,685
Benefits in kind (electricity/gas)	4,876	-	4,876
Retirement gratuities	898	(787)	111
Other	1,539	(16)	1,523
Provisions for other long-term employee benefits at 31/12/2019	**1,534**	**-**	**1,534**
Including:			
Annuities following work-related accident and illness, and invalidity	1,290	-	1,290
Long service awards	214	-	214
Other	30	-	30
PROVISIONS FOR EMPLOYEE BENEFITS AT 31/12/2019	**33,310**	**(12,581)**	**20,729**

16.2.3 Fund assets

For France, fund assets, managed under an asset/liability model, amount to €13,470 million at 31 December 2020 (€12,581 million at 31 December 2019) 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:

- 66% in a hedging pocket consisting of bonds, designed to replicate variations in the obligation caused by changes in interest rates;
- 34% in a growth asset pocket consisting of international equities.

Fund assets break down as follows:

(in millions of euros)	31/12/2020	31/12/2019
FUND ASSETS	**13,470**	**12,581**
Assets funding special pension benefits	**12,671**	**11,778**
Including (%)		
Listed equity instruments (shares)	34%	31%
Listed debt instruments (bonds)	66%	69%
Assets funding retirement gratuities	**784**	**787**
Including (%)		
Listed equity instruments (shares)	37%	34%
Listed debt instruments (bonds)	63%	66%
Other fund assets	**15**	**16**

At 31 December 2020, the equities held as part of fund assets are distributed as follows:

- approximately 59% of the total are shares in North American companies;
- approximately 19% of the total are shares in European companies;
- approximately 22% 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 2019.

At 31 December 2020, the bonds held as part of fund assets are distributed as follows:

- approximately 70% of the total are AAA and AA-rated bonds;
- approximately 30% of the total are bonds with A, BBB and other ratings.

Around 65% of bonds are sovereign bonds issued by Euro zone countries, and the balance mainly consists of bonds issued by financial and non-financial firms.

The performance of pension fund assets in France is +11% in 2020.

16.2.4 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	1,385	1,379
One to five years	4,596	4,460
Five to ten years	5,018	4,629
More than ten years	35,949	25,021
CASH FLOWS RELATED TO EMPLOYEE BENEFITS	**46,948**	**35,489**

At 31 December 2020, the average duration of employee benefit commitments in France is 20.6 years.

16.3 UNITED KINGDOM

The United Kingdom segment chiefly comprises EDF Energy.

16.3.1 Breakdown of obligations by type of beneficiary

(in millions of euros)	31/12/2020	31/12/2019
Current employees	5,702	5,202
Retirees	4,415	4,488
OBLIGATIONS	**10,117**	**9,690**

16.3.2 Funds assets

Pension obligations in the United Kingdom are partly covered by external funds with a present value of €11,406 million at 31 December 2020 (€10,712 million at 31 December 2019).

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)	31/12/2020	31/12/2019
BEGG pension fund	8,585	8,144
EEGSG pension fund	1,585	1,493
EEPS pension fund	1,236	1,075
FUND ASSETS	**11,406**	**10,712**
Including (%)		
Listed equity instruments (shares)	11%	11%
Listed debt instruments (bonds)	61%	57%
Real estate properties	6%	7%
Cash and cash equivalents	4%	2%
Other	18%	23%

At 31 December 2020, the equities held as part of fund assets are distributed as follows:

- approximately 60% of the total are shares in North American companies;
- approximately 23% of the total are shares in European companies;
- approximately 17% of the total are shares in companies in the Asia-Pacific zone and emerging countries.

At 31 December 2020, the bonds held as part of fund assets are distributed as follows:

- approximately 70% of the total are AAA and AA-rated bonds;
- approximately 30% of the total are bonds with A, BBB and other ratings.

Around 71% 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 1 percentage point higher than at 31 December 2019.

16.3.3 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	409	440
One to five years	1,742	1,690
Five to ten years	2,419	2,130
More than ten years	9,640	5,857
CASH FLOWS RELATED TO EMPLOYEE BENEFITS	**14,210**	**10,117**

The contribution to funds for 2021 is estimated at approximately €298 million (€288 million contributed by the employer and €10 million by the employees).

The average weighted duration of funds in the United Kingdom is 23.5 years at 31 December 2020.

NOTE 17 OTHER PROVISIONS AND CONTINGENT LIABILITIES

		31/12/2020			31/12/2019		
(in millions of euros)	Notes	Current	Non-current	Total	Current	Non-current	Total
Other provisions for decommissioning	17.1	120	1,744	**1,864**	105	1,573	**1,678**
Other provisions	17.2	2,675	3,630	**6,305**	2,710	3,065	**5,775**
OTHER PROVISIONS		**2,795**	**5,374**	**8,169**	**2,815**	**4,638**	**7,453**

17.1 OTHER PROVISIONS FOR DECOMMISSIONING

The breakdown by company is as follows:

(in millions of euros)	EDF	EDF Energy	Edison	Framatome	Other	Total
OTHER PROVISIONS FOR DECOMMISSIONING AT 31/12/2020	**772**	**128**	**172**	**412**	**380**	**1,864**
Other provisions for decommissioning at 31/12/2019	**667**	**143**	**161**	**388**	**319**	**1,678**

Other provisions for decommissioning principally concern fossil-fired power plants, installations for the production of nuclear fuel assemblies, and dismantling of wind farms.

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 2020 reflects the most recent known cost estimates and includes rehabilitation costs for generation sites.

Provisions for decommissioning notably include €140 million for Basic nuclear facilities (INB) in France, in the amounts of €78 million for Framatome and €62 million for Cyclife France. Dedicated assets have been set aside to cover these provisions as required by the regulations.

Dedicated assets of Framatome and Cyclife France

The dedicated assets of Framatome and Cyclife France (formerly SOCODEI) relating to Basic nuclear facilities (INB) in France have realisable values of €97 million in Framatome and €57 million in Cyclife France and the degree of coverage of provisions according to the regulations is 124% for Framatome and 91% for Cyclife France, mainly due to the decrease in the real discount rate at 31 December 2020.

17.2 OTHER PROVISIONS

Details of changes in other provisions are as follows:

(in millions of euros)	31/12/2019	Increases	Decreases		Changes in scope	Other changes[1]	31/12/2020
			Utilisations	Reversals			
Provisions for contingencies related to subsidiaries and investments	766	8	(28)	(8)	(1)	64	**801**
Provisions for tax liabilities (excluding income tax)	155	26	(13)	(2)	-	-	**166**
Provisions for litigation	479	68	(56)	(101)	-	2	**392**
Provisions for onerous contracts and losses on completion	1,356	527	(261)	(14)	(6)	288	**1,890**
Provisions related to environmental schemes	1,517	1,535	(1,807)	-	-	(53)	**1,192**
Other provisions for risks and liabilities	1,502	752	(356)	(46)	1	11	**1,864**
TOTAL	**5,775**	**2,916**	**(2,521)**	**(171)**	**(6)**	**312**	**6,305**

[1] *Other changes principally concern the effects of the change in real discount rate at 31 December 2020 (see note 8.2).*

Provision for onerous contracts

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

- 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;
- losses on gas-related service agreements are measured by comparing the costs of fulfilling a contract with the resulting economic benefits, based on market and sales assumptions.

Provisions for onerous contracts are mainly attributable to the Group's LNG activities (long-term LNG purchase contracts and a long-term regasification contract with Dunkerque LNG).

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 related to environmental schemes

Provisions related to environmental schemes include provisions to cover shortfalls in greenhouse gas emission rights, renewable energy certificates and energy savings certificates, based on the assigned obligations (see notes 5.4.3, 10.2, 20.1 and 20.2.1).

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 2020, a provision of €932 million was booked in connection with the obligation to surrender renewable energy certificates at that date, essentially concerning EDF Energy (United Kingdom) and Luminus (Belgium). A large portion of these obligations is covered by purchases of certificates included in intangible assets.

One of the main features of the third phase of the European Union **greenhouse gas emission quota system**, running from 2013 to 2020, is the discontinuation of free allocation of emission rights to electricity producers in certain countries, including France and United Kingdom.

In the EDF group, the entities concerned by this system are EDF, EDF Energy, Edison, Dalkia, PEI and Luminus.

In 2020, the Group surrendered, according the best estimate 21 million tonnes in respect of emissions generated in 2019. In 2019, the Group surrendered 26 million tonnes in respect of emissions generated in 2018.

The Group's total emission rights allocation for 2020 recorded in the national registers is 0 million tonnes (1 million tonnes for 2019).

The volume of emissions at 31 December 2020 stood at 19 million tonnes (21 million tonnes for 2019).

At 31 December 2020, a provision of €260 million was recognised for over-quota greenhouse gas emissions by the Group (€414 million at 31 December 2019).

Other provisions for risks and liabilities

These provisions cover various contingencies and expenses related to operations (employers' matching contributions to employee profit sharing, restructuring operations, contractual maintenance obligations, etc.). No individual provision is significant.

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.

17.3 CONTINGENT LIABILITIES

Accounting principles and methods

A contingent liability is:

- a potential obligation arising from past events, which will only be confirmed by the occurrence (or non-occurrence) of one or more uncertain future events that are not completely within the entity's control, or
- a present obligation arising from past events that is not recognised in the financial statements because an outflow of resources representing economic benefits is unlikely to be necessary to extinguish the obligation, or because the amount of the obligation cannot be measured reliably.

The principal contingent liabilities at 31 December 2020 are the following:

17.3.1 Tax inspections

EDF

For the period 2008 to 2017, EDF was notified of proposed tax adjustments, notably concerning the tax-deductibility of certain long-term liabilities. As stated in the 2019 financial statements, this recurrent reassessment, which is applied for each year, represented a cumulative financial risk of some €556 million in income taxes at 31 December 2019. In two rulings made in 2017 and one in 2019, Montreuil Administrative Court recognised the tax-deductibility of these liabilities and validated the position taken by the Company. The Minister appealed against two of these rulings. In January 2020, the Versailles Administrative Court upheld EDF's position for the year 2008, but the Minister appealed. In a decision of 11 December 2020 the Council of State overturned the Versailles court's decision and sent the case back before the same court (see note 15.1.1.4). In application of IFRIC 23, EDF has recognised a net tax liability of €510 million in its 2020 financial statements.

For the years 2012 to 2017, the French tax authorities notified the Company of certain recurrent tax reassessments concerning the *Cotisation 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 was approximately €310 million. EDF International contested this reassessment.

In judgements of 2 July 2019 for the period 2009-2013 and 30 January 2020 for the year 2014, Montreuil Administrative Court confirmed the tax reassessments. EDF International has therefore paid the tax in execution of these decisions, which it has also appealed.

17.3.2 Labour litigation

EDF and its subsidiaries are party to a number of labour lawsuits. The Group considers 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.

17.3.3 Litigation with photovoltaic producers

Announcements in 2010 of a cut in electricity purchase tariffs triggered an upsurge, particularly in August 2010, in connection applications submitted to distribution network operators in mainland France and in zones not interconnected to

the mainland national grid (since the applicable tariff depended on the date at which a complete connection application was filed). By a decree of 9 December 2010 (the "moratorium decree") the Government suspended the conclusion of new contracts with purchase obligations for a three-month period, and stated that any applications not approved by 2 December 2010 would have to be resubmitted at the end of this three-month period, based on a new decision fixing the purchase price for photovoltaic electricity. That tariff decision was issued on 4 March 2011, and significantly reduced the electricity purchase prices. A tender system was developed in parallel.

A ruling given by the French Council of State on 16 November 2011 rejecting appeals against the moratorium decree generated a large volume of legal proceedings against Enedis and EDF in late 2011 which continued through 2012, 2013, 2014 and 2015. Since March 2016, new actions for compensation relating to the photovoltaic moratorium are definitively barred.

Most of these legal proceedings were initiated by electricity producers who argued that they were forced to abandon their projects because the new electricity purchase tariffs made operating conditions less favourable. These producers consider the network operators responsible for this situation, on the grounds that they did not issue the technical and financial connection proposals in time for them to benefit from more advantageous electricity purchase terms.

The first instance and appeal court rulings given varied in their reasoning and verdicts: some rejected all claims while others awarded indemnities, which were generally smaller than the amounts initially claimed.

In December 2015 Versailles Appeal Court decided to apply to the Court of Justice of the European Union (CJEU) for a preliminary ruling on the point of whether the tariff decisions of 2006 and 2010 complied with European law on State aid.

This application was considered irreceivable for procedural reasons. On 20 September 2016, Versailles Appeal Court made another application to the CJEU for a preliminary ruling on the same point, and decided to suspend its own ruling. In an order of 15 March 2017, the CJEU confirmed that the decisions of 10 July 2006 and 12 January 2010 setting the purchase tariffs for photovoltaic electricity constituted "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 Commission, is illegal, and concluded that it was now up to the national courts to act accordingly, particularly by banning application of these illegal decisions.

Several courts found in favour of Enedis during 2018. Notably, in early July 2018 Versailles Appeal Court 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 were filed before the Court of Cassation against most of these decisions. On 18 September 2019, the French Court of Cassation issued several decisions rejecting claims concerning both Enedis and EDF, judging the aid illegal because the tariff decisions were not notified to the European Commission as required by article 108 of the TFEU. Consequently, the Court of Cassation concluded that the prejudice of producers who could not benefit from that aid is deemed not legally reparable. Court of Cassation decisions have essentially confirmed its ruling of 18 September 2019 and rejected producers' appeals founded on state aid arguments.

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 distribution 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 recognise the existence of two partial serial claims, a single excess and a single limit would apply for all claims with the same technical cause.

17.3.4 Edison – Sale of Ausimont (site de Bussi)

Several legal actions before the civil, administrative and criminal courts were begun following the sale by Edison of the Ausimont SpA industrial complex to Solvay Solexis SpA in 2002. The following proceedings are still ongoing:

- two administrative cases:
  - on 28 February 2018, the Province of Pescara notified Solvay Speciality Polymers Italy SpA (formerly Solvay Solexis SpA) and Edison SpA of the launch of an administrative procedure to determine who was responsible for the pollution of the land outside the industrial complex belonging to Ausimont SpA which had been sold. The Province also ordered it to remove waste that was on the land concerned. Edison first appealed against this order before Pescara regional administrative court, and then before the Italian Council of State. In April 2020 the Council of State rejected the claim and Edison, considering the ruling unfair and unlawful, filed an application for its annulment before the Court of Cassation and the Council of State. The proceedings are ongoing. Meanwhile Edison has begun work to make the site safe in agreement with the competent Public Administrations;

- in an announcement of 18 December 2019, the Province of Pescara ordered Edison SpA to clean up the land located inside the industrial complex. Edison has challenged this order before Pescara regional administrative court and the proceedings are ongoing;

- one arbitration case: in 2012, arbitration proceedings were launched by Solvay SA and Solvay Specialty Polymers Italy SpA (the purchaser of Ausimont) for violation by Edison of the representations and warranties in environmental matters concerning the Bussi and Spinetta Marengo sites contained in the sale agreement. These proceedings are ongoing, and Edison expects a decision within the first half of 2021;
- one civil case: on 8 April 2019, the Italian Ministry for the Environment brought a civil action against Edison, claiming damages for environmental disaster. These proceedings are ongoing.

17.3.5 Edison - Mantua - Environmental procedure

In recent years the Italian province of Mantua notified Edison of eight orders to rehabilitate land and the whole Mantua petrochemical site sold by Montedison to the ENI group in 1990, despite two settlement agreements concerning these environmental matters signed by Montedison and Edison with ENI and the Italian Ministry for the Environment.

Edison appealed against all these orders before the Brescia division of the Lombardy regional administrative court, but lost its appeal in August 2018. Edison then took the matter to the Italian Council of State.

The Council of State rejected Edison's appeal in a ruling of 1 April 2020 and the first-instance decisions were therefore upheld.

Edison pursued its appeal before the Court of Cassation and the Council of State itself.

However, Edison has already begun remedial work on site, taking over from the previous operators by proceeding to a series of tenders.

17.3.6 Enedis – Quadlogic

On 24 February 2016, Enedis received a summons for proceedings brought before the Paris Regional Court by an American company, Quadlogic Controls Corporation (QCC), for alleged infringement of a European patent held by QCC. Enedis strongly contested both QCC's inventive input and the alleged infringement.

In November 2017, the Paris Regional Court ruled in favour of Enedis and cancelled QCC's European patent in France. QCC filed an appeal against this ruling on 12 March 2018.

In November 2020 the parties reached an amicable settlement that ended this litigation.

NOTE 18 FINANCIAL ASSETS AND LIABILITIES

Accounting principles and methods

Financial assets comprise equity instruments (particularly non-consolidated investments), debt securities, loans and receivables at amortised cost, derivative assets (see note 18.7) and cash and cash equivalents (see note 18.2).

The classification and measurement of financial instruments depend on the business model and the instruments' contractual characteristics. They are carried at amortised cost, fair value through other comprehensive income (OCI), or fair value through profit and loss.

Financial liabilities comprise loans and other financial liabilities, bank credit and derivative liabilities (see note 18.7).

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.

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 the Group derecognises the debt and recognises a new liability when the

new terms are substantially different; otherwise, the book value is recalculated. In either case, the impacts of the debt renegotiation are recorded in profit and loss.

18.1 FINANCIAL ASSETS

Accounting principles and methods

Financial assets comprise debt and equity securities. The accounting treatment applied depends on their contractual characteristics and business model

Financial assets carried at fair value through OCI with or without recycling

Financial assets carried at fair value through OCI comprise:

- non-consolidated investments for which the Group has irrevocably opted 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.

At each reporting date, they are adjusted to fair value based on quoted prices where possible, or using the discounted future cash flow method or by reference to external sources otherwise. Changes in the fair value of these instruments are recorded directly in OCI with recycling (for debt securities) or OCI with no recycling (for equity instruments) in the income statement.

Financial assets carried at fair value through profit and loss

Financial assets carried at fair value through profit and loss comprise:

- assets acquired from inception with the intention of resale in the short term;
- derivatives not classified as hedges (derivatives held for trading) (see note 18.7);
- equity instruments (non-consolidated investments) which the Group has not irrevocably opted to classify as at fair value through OCI with no recycling;
- debt securities that do not meet the requirements of the SPPI test, regardless of their business model. This chiefly concerns shares in investment funds.

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 reporting date, they are adjusted to fair value based on quoted prices where possible, or using recognised valuation techniques such as the discounted cash flow method or reference to external sources otherwise. Changes in the fair value of these instruments are recorded in the income statement under the heading “Other financial income and expenses".

Financial assets carried at amortised cost

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.

The 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 are not eligible for classification at amortised cost are carried at fair value through profit and loss, and recorded in “Other financial income and expenses” in the income statement.

Impairment model

The impairment model is based on expected credit loss (ECL). 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 year-end.

The threshold indicating a significant increase in credit risk is reached when the counterparty ceases to be rated "Investment Grade". The significant increase in the default risk may lead to reassessment of the ECL 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.

18.1.1 Breakdown between current and non-current financial assets

Current and non-current financial assets break down as follows:

	31/12/2020			31/12/2019		
(in millions of euros)	Current	Non-current	Total	Current	Non-current	Total
Instruments at fair value through OCI with recycling	13,044	5,696	**18,740**	17,711	6,208	**23,919**
Instruments at fair value through OCI with no recycling	34	228	**262**	5	447	**452**
Instruments at fair value through profit and loss	2,556	22,807	**25,363**	1,593	20,193	**21,786**
Debt and equity securities	***15,634***	***28,731***	***44,365***	***19,309***	***26,848***	***46,157***
Trading derivatives – Positive fair value	5,038	-	**5,038**	6,813	-	**6,813**
Hedging derivatives – Positive fair value	1,625	3,814	**5,439**	1,803	3,956	**5,759**
Loans and financial receivables[(1)]	1,235	15,070	**16,305**	1,476	15,415	**16,891**
CURRENT AND NON-CURRENT FINANCIAL ASSETS	23,532	47,615	71,147	29,401	46,219	75,620

[(1)]Including impairment of €(432) million at 31 December 2020 (€(352) million at 31 December 2019).

18.1.2 Debt and equity securities

Details of debt and equity securities

Financial assets are monitored and managed by the Group with two main objectives:

- **dedicated assets set aside in France for secure financing of nuclear plant decommissioning expenses and long-term storage expenses for radioactive waste, as required by article L. 594 of France's Environment Code.** These assets consist of diversified investments in bonds, monetary and equity investment funds, and equity investments held by EDF Invest. The general management policy for dedicated assets and a breakdown of the portfolio is presented in note 15.1.2;
- **assets managed according to a liquidity-oriented policy** ("liquid assets"). These are financial assets consisting of funds or interest rate instruments with initial maturity of over three months that are readily convertible into cash. EDF's monetary investment funds included in liquid assets amount to €2,441 million at 31 December 2020 (€409 million at 31 December 2019).

Details of debt and equity securities are shown in the table below:

(in millions of euros)	31/12/2020				31/12/2019
	At fair value through OCI with recycling	At fair value through OCI with no recycling	At fair value through profit and loss	Total	Total
Debt and equity securities					
EDF dedicated assets	6,172	-	22,226	**28,398**	**26,018**
Liquid assets	12,509	-	2,519	**15,028**	**18,900**
Other assets[1]	59	262	618	**939**	**1,240**
TOTAL	**18,740**	**262**	**25,363**	**44,365**	**46,157**

[1] *Investments in non-consolidated companies.*

Changes in debt and equity securities

(in millions of euros)	31/12/2019	Net increases	Changes in fair value	Changes in scope	Translation adjustments	Other	31/12/2020
Instruments at fair value through OCI with recycling	**23,919**	(5,091)	143	-	(243)	12	**18,740**
Instruments at fair value through OCI with no recycling	**452**	1	(39)	(179)	-	27	**262**
Instruments at fair value through profit and loss	**21,786**	2,614	819	121	(8)	31	**25,363**
TOTAL DEBT AND EQUITY SECURITIES	**46,157**	**(2,476)**	**923**	**(58)**	**(251)**	**70**	**44,365**

Changes in fair value recorded in equity

Changes in the fair value of debt and equity securities were recorded in equity (EDF share) over the period as follows:

(in millions of euros)	2020			2019		
	Gross changes in fair value recorded in OCI with recycling[1]	Gross changes in fair value recorded in OCI with no recycling[1]	Gross changes in fair value recycled to profit and loss[2]	Gross changes in fair value recorded in OCI with recycling[1]	Gross changes in fair value recorded in OCI with no recycling [1]	Gross changes in fair value recycled to profit and loss [2]
EDF dedicated assets	224	-	162	297	-	136
Liquid assets	(29)	-	13	139	-	7
Other assets	-	(34)	-	-	(22)	-
DEBT AND EQUITY SECURITIES [3]	**195**	**(34)**	**175**	**436**	**(22)**	**143**

[1] *+/( ): increase /(decrease) in equity (EDF share).*
[2] *+/( ): increase /(decrease) in income (EDF share).*
[3] *Excluding associates and joint ventures.*

In 2020, gross changes in fair value recorded in OCI with recycling principally concern EDF (€20 million, including €62 million for dedicated assets).In 2019, gross changes in fair value recorded in OCI with recycling principally concern EDF (€293 million, including €161 million for dedicated assets).

No significant impairment was recorded in 2020.

18.1.3 Loans and financial receivables

Loans and financial receivables consist of the following:

(in millions of euros)	31/12/2020	31/12/2019
Amounts receivable from the NLF	13,034	13,303
CSPE	-	684
Loans and financial receivables – other	3,271	2,904
LOANS AND FINANCIAL RECEIVABLES	**16,305**	**16,891**

At 31 December 2020 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 €13,034 million at 31 December 2020 (€13,303 million at 31 December 2019), discounted at the same rate as the provisions they finance (see note 15.2);
- the receivable corresponding to the accumulated shortfall in the Contribution to the Public Electricity Service (CSPE) at 31 December 2017 and the costs of bearing that shortfall. In 2020, reimbursements of principal and interest amounted to €660 million and €30 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. At 31 December 2020, EDF's financial receivable was fully repaid by the State (see note 5.4.1). This CSPE receivable was allocated in its entirety to dedicated assets;
- other loans and financial receivables notably include:
  - the overfunding of EDF Energy's EEGSG and BEGG pension schemes by €1,725 million, compared to €1,246 million at 31 December 2019 (see note 16.1.1);
  - an amount of €263 million representing the advance payments made by Luminus to Synatom to cover long-term nuclear obligations (€230 million at 31 December 2019). In Luminus' financial statements these amounts are discounted at the same rate as the provisions they fund (see note 15.3). This receivable is equal to the fair value of the amounts held by Synatom on behalf of Luminus as fund assets;
  - loans made by EDF Renewables in the course of its project development activity, mainly in connection with wind farms in France and North America, amounting to €382 million at 31 December 2020 compared to €559 million at 31 December 2019.

Changes in loans and financial receivables

(in millions of euros)	31/12/2019	Net increases	Discount effect	Changes in scope	Translation adjustments	Other	31/12/2020
Loans and financial receivables	**16,891**	(913)	262	(61)	(827)	953	**16,305**

The net decrease in loans and financial receivables includes the €(684) million change in the CSPE receivable.

Other changes in loans and financial receivables principally correspond to the changes in the receivable representing amounts reimbursable by the Nuclear Liabilities Fund (NLF) and the British government, and the surplus funding of EDF Energy's EEGSG and BEGG pension schemes.

18.2 CASH AND CASH EQUIVALENTS

Accounting principles and methods

Cash and cash equivalents comprise immediately available liquidities and very short-term investments that are readily convertible (e.g. in monetary funds) 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. These items are held to cover short-term obligations rather than for short-term investments or other purposes. When they mature in more than 3 months, they are included in Liquid assets in Debt and equity securities (see note 18.1.2).

"Cash equivalents" are recorded at fair value, with changes in fair value included in the heading "Other financial income and expenses".

Cash and cash equivalents include the following amounts recorded in the balance sheet:

(in millions of euros)	31/12/2020	31/12/2019
Cash	5,832	3,698
Cash equivalents	438	236
CASH AND CASH EQUIVALENTS	**6,270**	**3,934**

Cash restrictions

Cash and cash equivalents include €242 million of cash subject to restrictions at 31 December 2020 (€213 million at 31 December 2019) (see note 1.3.5).

18.3 FINANCIAL LIABILITIES

Accounting principles and methods

Loans and other financial liabilities are carried at amortised cost, adjusted for changes in the value of the risks hedged when they are covered by a fair value hedge (see note 18.7). Interest expenses are calculated at the effective interest rate and recorded in the income statement in "Cost of gross financial indebtedness" over the duration of the loan or financial liability.

18.3.1 Breakdown between current and non-current financial liabilities

Current and non-current financial liabilities break down as follows:

	31/12/2020			31/12/2019		
(in millions of euros)	Non-current	Current	Total	Non-current	Current	Total
Loans and other financial liabilities	54,066	11,525	**65,591**	56,306	11,074	**67,380**
Trading derivatives - negative fair value[(1)]	-	5,125	**5,125**	-	6,327	**6,327**
Hedging derivatives - negative fair value[(1)]	1,833	959	**2,792**	696	1,134	**1,830**
FINANCIAL LIABILITIES	**55,899**	**17,609**	**73,508**	**57,002**	**18,535**	**75,537**

[(1)] *See note 18.7.*

18.3.2 Loans and other financial liabilities

18.3.2.1 Changes in loans and other financial liabilities

(in millions of euros)	Bonds	Loans from financial institutions	Other financial liabilities	Lease liability	Accrued Interest	Total
Balances at 31/12/2019	**52,448**	**3,139**	**5,952**	**4,510**	**1,331**	**67,380**
Increases	2,531	835	3,235	479	129	7,209
Decreases	(3,769)	(371)	(2,293)	(719)	(215)	(7,367)
Translation adjustments	(440)	(119)	(210)	(44)	(6)	(819)
Changes in scope of consolidation	(18)	(206)	(19)	(20)	(2)	(265)
Changes in fair value	(554)	3	(81)	-	-	(632)
Other changes	(2)	16	(13)	101	(17)	85
BALANCES AT 31/12/2020	**50,196**	**3,297**	**6,571**	**4,307**	**1,220**	**65,591**

The main **bond**-related operation of 2020 was the offering of green bonds convertible into new shares and/or exchangeable for existing shares (*OCEANEs Vertes*). The debt component of these bonds is presented in bonds at the net-of-expense amount of €2,389 million (see notes 14.4.1 and 18.3.2.2).

At 31 December 2020, EDF's **other financial liabilities** include negotiable debt instruments amounting to €2,288 million, and an amount of €821 million recognised in respect of the cash received for debt securities transferred to banks under repurchase agreements. These operations do not affect the net indebtedness.

A breakdown of the issuance and repayments of borrowings as presented **in the cash flow statement** is presented below:

(in millions of euros)	Bonds	Loans from financial institutions	Other financial liabilities	Lease liability	Termination of hedging derivatives	31/12/2020
Issuance of borrowings	2,531	835	3,235	-	-	**6,601**
Repayments of borrowings	(3,769)	(371)	(2,293)	(719)	90	**(7,062)**

18.3.2.2 Principal borrowings of the Group

The Group's principal borrowings (excluding green bonds and OCEANEs) at 31 December 2020 are as follows:

Type of borrowing *(in millions of currencies)*	Entity	Issue[(1)]	Maturity	Issue amount	Currency	Rate
Euro MTN	EDF	01/2009	01/2021	2,000	EUR	6.25%
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%
Euro MTN	EDF	11/2010	11/2025	750	EUR	4.00%
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	12/2019	12/2049	1,250	EUR	2.00%
Euro MTN	EDF	09/2010	09/2050	1,000	GBP	5.13%
Euro MTN	EDF	10/2016	10/2056	2,164	USD	4.99%
Euro MTN	EDF	11/2019	12/2069	2,000	USD	4.50%
Bond	EDF	01/2014	01/2114	1,350	GBP	6.00%

[(1)] *Date funds were received.*

At 31 December 2020, the Group's principal green bonds (see note 20.3.1) are as follows:

Type of borrowing *(in millions of currencies)*	Entity	Issue	Maturity	Issue amount	Currency	Rate
Euro MTN (green bond)	EDF	11/2013	04/2021	1,400	EUR	2.25%
Bond (green bond)	EDF	10/2015	10/2025	1,250	USD	3.63%
Euro MTN (green bond)	EDF	10/2016	10/2026	1,750	EUR	1.00%

On 8 September 2020, EDF made an offering of green bonds convertible into new shares and/or exchangeable for existing shares (*OCEANEs Vertes*). The key features of this issue are as follows:

Type of borrowing *(in millions of currencies)*	Entity	Issue	Maturity	Issue amount	Currency	Rate
OCEANEs Vertes green bonds	EDF	09/2020	09/2024	2,400	EUR	0%

The issue price for these bonds was €11.70, i.e. 107.00% of their nominal value or a gross annual return of -1.68%. The nominal value of the bonds was set at €10.93 including a conversion premium of 32.5% over the Company's reference price on Euronext Paris, the regulated Paris stock market[1].

Holders of these bonds have the right to convert them into new EDF shares and/or exchange them for existing EDF shares.

The conversion and/or exchange rate is set at one share per bond, subject to the standard adjustments including anti-dilution and dividend protections as described in the terms of the issue.

The bonds may be redeemed prior to maturity at the option of the Company, subject to certain conditions.

Unless previously converted, exchanged, redeemed or repurchased and cancelled, the bonds will be redeemed at nominal value when they reach maturity.

These bonds are listed on the Euronext Access™ market operated by Euronext in Paris.

18.3.3 Loans and financial liabilities by maturity, currency and interest rate

18.3.3.1 Maturity of loans and financial liabilities

(in millions of euros)	Bonds	Loans from financial institutions	Other financial liabilities	Lease liability	Accrued Interest	Total
Less than one year	3,447	575	5,951	673	879	**11,525**
From one to five years	12,078	1,478	106	2,034	136	**15,832**
More than five years	34,671	1,244	514	1,600	205	**38,234**
LOANS AND OTHER FINANCIAL LIABILITIES AT 31/12/2020	**50,196**	**3,297**	**6,571**	**4,307**	**1,220**	**65,591**

The non-discounted lease liability matures as follows:

	31/12/2020				31/12/2019
	Total	Maturity			Total
(in millions of euros)		< 1 year	1-5 years	> 5 years	
NON-DISCOUNTED CONTRACTUAL CASH FLOWS	**4,883**	**757**	**2,183**	**1,943**	**5,052**

18.3.3.2 Breakdown of loans and other financial liabilities by currency

The breakdown of loans and other financial liabilities by currency includes the effect of derivatives classified as hedges (of debts in foreign currencies and net investments in foreign subsidiaries) under IFRS 9.

At 31 December 2020

	31/12/2020				
	Initial debt structure		Impact of hedging instruments	Debt structure after hedging	
(in millions of euros)	amount	% of debt	amount	amount	% of debt
Euro (EUR)	36,241	55%	11,798	48,039	73%
American dollar (USD)	16,735	26%	(10,958)	5,777	9%
Pound sterling (GBP)	9,996	15%	537	10,533	16%
Other	2,619	4%	(1,377)	1,242	2%
LOANS AND OTHER FINANCIAL LIABILITIES	**65,591**	**100%**	**-**	**65,591**	**100%**

1 *The reference price is equal to the volume-weighted average EDF share price observed on Euronext Paris between the launch date of the green bond offering until the final pricing of the bonds was determined the same day, i.e. €8.2465.*

At 31 December 2019

	31/12/2019				
	Initial debt structure		Impact of hedging instruments	Debt structure after hedging	
(in millions of euros)	amount	% of debt	amount	amount	% of debt
Euro (EUR)	33,360	50%	18,491	51,851	77%
American dollar (USD)	20,867	31%	(14,814)	6,053	9%
Pound sterling (GBP)	10,269	15%	(1,705)	8,564	13%
Other	2,884	4%	(1,972)	912	1%
LOANS AND OTHER FINANCIAL LIABILITIES	**67,380**	**100%**	**-**	**67,380**	**100%**

18.3.3.3 Breakdown of loans and other financial liabilities by type of interest rate

The breakdown of loans and other financial liabilities by type of interest rate includes the effect of derivatives classified as hedges under IFRS 9.

At 31 December 2020

	31/12/2020				
	Initial debt structure		Impact of hedging instruments	Debt structure after hedging	
(in millions of euros)	amount	% of debt	amount	amount	% of debt
Fixed rates	60,667	92%	(15,217)	45,450	69%
Floating rates	4,924	8%	15,217	20,141	31%
LOANS AND OTHER FINANCIAL LIABILITIES	**65,591**	**100%**	**-**	**65,591**	**100%**

At 31 December 2019

	31/12/2019				
	Initial debt structure		Impact of hedging instruments	Debt structure after hedging	
(in millions of euros)	amount	% of debt	amount	amount	% of debt
Fixed rates	62,128	92%	(21,035)	41,093	61%
Floating rates	5,252	8%	21,035	26,287	39%
LOANS AND OTHER FINANCIAL LIABILITIES	**67,380**	**100%**	**-**	**67,380**	**100%**

A large portion of the EDF group's fixed-rate loans is swapped to variable rates.

18.3.4 Early repayment clauses

Project financing loans to EDF Renewables from non-Group parties generally include early repayment clauses, mainly applicable when the project company concerned 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.

Three borrowings with a combined total of €1,150 million contain a rendezvous clause requiring contact between the borrower and lender if the borrower's rating falls below a specified level, possibly leading to renegotiation of the terms of the loan.

No early repayment took place in 2020 as a result of any Group entity's failure to comply with contractual clauses concerning loans.

18.4 UNUSED CREDIT LINES

In 2019, EDF signed 3 renewable credit lines, each one for €300 million, respectively with BBVA, the Crédit Agricole group and Société Générale CIB.

These three credit facilities incorporate an adjustment mechanism that links their cost to three of the Group's sustainability KPIs: direct CO_2 emissions, use of online consumption monitoring tools by its French residential customers (as a proxy for EDF's success in getting French residential customers actively engaged with their energy consumption), and electrification of its light vehicle fleet.

On 30 October 2020 EDF and Standard Chartered Bank signed a €200 million renewable credit facility. The cost of this facility will be indexed on three EDF group sustainability KPIs: EDF's direct CO_2 emissions, electrification of its light vehicle fleet, and use of online consumption monitoring tools by its French residential customers (see note 20.3.2).

At 31 December 2020, the Group has unused credit lines with various banks totalling €11,110 million (€10,490 million at 31 December 2019), including €5,650 million of credit lines indexed on ESG criteria.

	31/12/2020				31/12/2019
	Total	Maturity			Total
(in millions of euros)		< 1 year	1-5 years	> 5 years	
CONFIRMED CREDIT LINES	11,110	1,808	8,483	819	10,490

18.5 FAIR VALUE OF FINANCIAL INSTRUMENTS

Accounting principles and methods

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. deduced from observable prices);
- level 3 (non-observable data): data that are not observable on a market, including observable data that have been significantly adjusted.

The distribution of financial assets and liabilities in the balance sheet by level is as follows:

At 31 December 2020

(in millions of euros)	Balance sheet value	Fair value	Level 1 Unadjusted quoted prices	Level 2 Observable data	Level 3 Non-observable data
Equity securities	1,563	1,563	24	1,121	418
Debt securities	42,802	42,802	2,423	40,337	42
Hedging derivatives	5,439	5,439	59	5,372	8
Trading derivatives	5,038	5,038	289	4,057	692
Cash equivalents	438	438	343	95	-
Financial assets carried at fair value	**55,280**	**55,280**	**3,138**	**50,982**	**1,160**
Receivables from the NLF	13,034	13,034	-	13,034	-
Other loans and financial receivables	3,271	3,271	-	3,271	-
Financial assets carried at amortised cost	**16,305**	**16,305**	**-**	**16,305**	**-**
Hedging derivatives	2,792	2,792	1	2,791	-
Trading derivatives	5,125	5,125	290	4,645	190
Financial liabilities carried at fair value	**7,917**	**7,917**	**291**	**7,436**	**190**
Loans and other financial liabilities	65,591	75,680	-	75,680	-
Financial liabilities carried at amortised cost	**65,591**	**75,680**	**-**	**75,680**	

Level 3 debt and equity securities are principally non-consolidated investments carried at historical value.

At 31 December 2019

(in millions of euros)	Balance sheet value	Fair value	Level 1 Unadjusted quoted prices	Level 2 Observable data	Level 3 Non-observable data
Equity securities	1,603	1,603	15	1,002	586
Debt securities	44,554	44,554	3,718	40,798	38
Hedging derivatives	5,759	5,759	15	5,731	13
Trading derivatives	6,813	6,813	53	6,244	516
Cash equivalents	236	236	156	80	-
Financial assets carried at fair value	**58,965**	**58,965**	**3,957**	**53,855**	**1,153**
Receivables from the NLF	13,303	13,303	-	13,303	-
CSPE receivable	684	688	-	688	-
Other loans and financial receivables	2,904	2,904	-	2,904	-
Financial assets carried at amortised cost	**16,891**	**16,895**	**-**	**16,895**	**-**
Hedging derivatives	1,830	1,830	5	1,825	-
Trading derivatives	6,327	6,327	38	5,914	375
Financial liabilities carried at fair value	**8,157**	**8,157**	**43**	**7,739**	**375**
Loans and other financial liabilities	67,380	75,407	-	75,407	-
Financial liabilities carried at amortised cost	**67,380**	**75,407**	**-**	**75,407**	**-**

Level 3 debt and equity securities are principally non-consolidated investments carried at historical value.

18.6 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.

A more detailed description of these risks and the sensitivity analyses required by IFRS 7 can be found in section 7 of the management report, “Financial Information – Management and control of market risks”.

- **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.

- **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.

- **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.

  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 13.3.1.

18.7 DERIVATIVES AND HEDGE ACCOUNTING

Accounting principles and methods

The Group uses derivatives such as swaps and forward contracts to hedge its interest rate, foreign exchange, energy and commodity risks.

In accordance with IFRS 9, hedge accounting can be applied to derivatives when they meet certain eligibility criteria. Some derivatives classified as "own use" are excluded from application of IFRS 9.

Derivatives not covered by IFRS 9: "own use" contracts

Forward purchase and sale contracts for physical delivery of energy or commodities are considered to fall outside the scope of application of IFRS 9 when they are 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 these 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 normal business as an integrated electricity operator, and are thus outside the scope of IFRS 9.

Measurement and recognition of derivatives

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.

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.

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, particularly regarding the existence of formal documentation from their inception and compliance with hedge effectiveness requirements.

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 defined 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:

- fair value hedge;
- cash flow hedge;
- net foreign investment hedge.

Hedge categories

Fair value hedge

This is a hedge of 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 profit and loss and offset by corresponding variations in the fair value of the hedging instrument. Only the ineffective portion of the hedge has an impact on profit and loss.

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

Cash flow hedge

This is a hedge of 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 hedging instrument'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 profit and loss.

When the hedged cash flows materialise, 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 non-financial asset acquired.

Net foreign investment hedge

This is a hedge of 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 hedging instrument'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 profit and loss.

This risk is hedged in the EDF Group level either by matching it with debts in the same currency, or by using derivatives.

Trading derivatives

Trading derivatives comprise:

- derivatives subscribed for economic hedging that do not qualify as hedges for accounting purposes; changes in the value of these instruments are reported in profit and loss. When the derivatives are used for economic hedging of negotiable debt instruments and purchased bonds, they are included in "Other financial income and expenses". When the derivatives are used for economic hedging of generation and supply operations, they are included in "Net changes in fair value on Energy and Commodity derivatives, excluding trading activities" (see note 6);
- derivatives used in trading activities; changes in the fair value of these instruments are included in sales (see note 5.1).

18.7.1 Breakdown of hedging and trading derivatives

The fair value of hedging and trading derivatives reported in the balance sheet breaks down as follows:

(in millions of euros)	Notes	31/12/2020	31/12/2019
Positive fair value of hedging derivatives	18.1.1	5,439	5,759
Negative fair value of hedging derivatives	18.3.1	(2,792)	(1,830)
FAIR VALUE OF HEDGING DERIVATIVES		**2,647**	**3,929**
Positive fair value of trading derivatives	18.1.1	5,038	6,813
Negative fair value of trading derivatives	18.3.1	(5,125)	(6,327)
FAIR VALUE OF TRADING DERIVATIVES		**(87)**	**486**

The fair value of hedging and trading derivatives by type of risk hedged is shown below:

(in millions of euros)	Notes	31/12/2020	31/12/2019
Hedging derivatives - interest rate risk	18.7.2	3,149	2,939
Hedging derivatives - foreign exchange risk	18.7.3	(733)	877
Hedging derivatives - commodity risks	18.7.4	231	113
FAIR VALUE OF HEDGING DERIVATIVES		**2,647**	**3,929**
Trading derivatives - interest rate risk	18.7.2	(25)	(22)
Trading derivatives - foreign exchange risk	18.7.3	4	(185)
Trading derivatives - commodity risk	18.7.4	(66)	693
FAIR VALUE OF TRADING DERIVATIVES		**(87)**	**486**

The fair value of hedging derivatives by type and purpose of hedge is shown below:

(in millions of euros)	Notes	31/12/2020	31/12/2019
Fair value hedges of loans and liabilities		3,724	3,474
Cash flow hedges of loans and liabilities		(1,738)	(87)
Sub-total	19.2	**1,986**	**3,387**
Fair value hedges of commodity contracts		6	106
Cash flow hedges of commodity contracts		170	138
Sub-total		**176**	**244**
Net foreign investment hedges		280	261
Fair value hedges of dedicated assets		205	37
FAIR VALUE OF HEDGING DERIVATIVES		**2,647**	**3,929**

18.7.2 Interest rate derivatives

The Group is exposed to the risk of fluctuations in interest rates that can affect the value of its loans and financial liabilities, its assets (liquid assets and dedicated assets), and its future financial expenses.

The Group hedges its exposure to changes in the fair value of fixed-rate debts, many of which are converted to floating rates. The derivatives used for these hedges are fixed/floating interest rate swaps and cross-currency swaps, with changes in fair value recorded in profit and loss symmetrically to changes in the value of the hedged debts.

The Group also hedges its floating-rate debt against future changes in interest rates by using floating/fixed interest rate swaps for cash flow hedges.

Details of interest rate derivatives used in a hedging relationship or designated as trading derivatives are shown below:

	Notional at 31/12/2020				Notional at 31/12/2019	Fair Value	
(in millions of euros)	<1 year	1-5 years	>5 years	**Total**	**Total**	**31/12/2020**	31/12/2019
Fixed rate payer/floating rate receiver	111	1,301	4,511	**5,923**	2,733	**(144)**	(51)
Floating rate payer/fixed rate receiver	1,400	4,612	14,666	**20,678**	23,633	**4,143**	3,143
Floating rate/floating rate	-	800	1,508	**2,308**	2,447	**3**	60
Fixed rate/fixed rate	764	682	8,152	**9,598**	9,901	**(853)**	(213)
Interest rate *swaps*	**2,275**	**7,395**	**28,837**	**38,507**	**38,714**	**3,149**	**2,939**
INTEREST RATE DERIVATIVES - HEDGING	2,275	7,395	28,837	38,507	38,714	3,149	2,939
Interest rate operations	-	-	515	**515**	**520**	**8**	**14**
Interest rate swaps	**1,379**	**1,954**	**612**	**3,945**	**5,181**	**(33)**	**(36)**
INTEREST RATE DERIVATIVES - TRADING	1,379	1,954	1,127	4,460	5,701	(25)	(22)

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 currency derivatives (see note 18.7.3).

18.7.3 Currency derivatives

The Group is exposed to the risk of exchange rate fluctuations due to the diversification of its businesses, supply contracts in foreign currencies for goods and services, and its geographical locations. These fluctuations can affect the Group's translation differences recognised in equity, balance sheet items, financial expenses, equity and net income.

There are several types of hedged item:

- Liabilities in foreign currencies, for which cross-currency swaps are used in cash flow hedge;
- Financial assets subscribed in foreign currencies;
- Purchases of commodities and fuels, for which the Group hedges the associated foreign exchange risk;
- Net investments in subsidiaries in foreign currencies.

Details of currency derivatives used in a hedging relationship or designated as trading derivatives are shown in the following tables. The notional value of cross-currency swaps is included both in this note and the note on interest rate hedging derivatives (see note 18.7.2).

At 31 December 2020

	Notional amount to be received at 31/12/2020				Notional amount to be given at 31/12/2020				Fair value
(in millions of euros)	<1 year	1-5 years	>5 years	**Total**	<1 year	1-5 years	>5 years	**Total**	**31/12/2020**
Forward exchange transactions	1,480	91	-	**1,571**	1,473	91	-	**1,564**	**(1)**
Swaps	20,394	6,891	16,368	**43,653**	20,090	6,933	17,152	**44,175**	**(745)**
Options	355	-	-	**355**	326	-	-	**326**	**13**
CURRENCY DERIVATIVES - HEDGING	22,229	6,982	16,368	45,579	21,889	7,024	17,152	46,065	(733)
Forward transactions	3,389	6,490	-	**9,879**	3,380	6,491	-	**9,871**	**4**
Swaps	14,576	5,180	275	**20,031**	14,606	5,162	255	**20,023**	**-**
Options	10	-	-	**10**	11	-	-	**11**	**-**
CURRENCY DERIVATIVES -TRADING	17,975	11,670	275	29,920	17,997	11,653	255	29,905	4

At 31 December 2019

	Notional amount to be received at 31/12/2019				Notional amount to be given at 31/12/2019				Fair value
(in millions of euros)	<1 year	1-5 years	>5 years	**Total**	<1 year	1-5 years	>5 years	**Total**	**31/12/2019**
Forward exchange transactions	1,843	1,357	-	**3,200**	1,838	1,526	-	**3,364**	**3**
Swaps	19,619	6,566	17,367	**43,552**	19,006	6,268	16,892	**42,166**	**874**
CURRENCY DERIVATIVES - HEDGING	21,462	7,923	17,367	46,752	20,844	7,794	16,892	45,530	877
Forward transactions	4,220	3,280	-	**7,500**	4,187	3,262	-	**7,449**	**29**
Swaps	14,203	6,387	198	**20,788**	14,328	6,536	198	**21,062**	**(214)**
CURRENCY DERIVATIVES - TRADING	18,423	9,667	198	28,288	18,515	9,798	198	28,511	(185)

The notional value of cross-currency swaps shown in this note is also included in the note on interest rate derivatives (see note 18.7.2).

18.7.4 Commodity derivatives

The Group is exposed 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.

The Group hedges its forecast sales and purchases of electricity, gas, and coal using futures, forwards, options and swaps, essentially through cash flow hedges.

Details of commodity derivatives used for hedging are as follows:

		31/12/2020					31/12/2019	
	Units of measure	Net notional				Fair value	Net notional	Fair value
(in millions of euros)		< 1 year	1-5 years	> 5 years	Total			
Electricity	TWh	(9)	(15)	-	(25)	35	(49)	393
Gas	Millions of therms	1,083	1,048	-	2,131	102	2,253	(398)
Oil products	Thousands of barrels	3,062	6,548	-	9,610	18	13,637	2
CO_2	Thousands of tonnes	4,501	3,424	-	7,925	76	26,666	44
Coal	Millions of tonnes	(1)	-	-	(1)	-	(416)	72
COMMODITY DERIVATIVES - HEDGING		**8,636**	**11,005**	**-**	**19,640**	**231**	**42,091**	**113**

Details of commodity derivatives used for trading are as follows:

		31/12/2020		31/12/2019	
(in millions of euros)	Units of measure	Net notional	Fair value	Net notional	Fair value
Electricity	TWh	(174)	(380)	(17)	824
Gas	Millions of therms	(6,803)	310	(7,826)	76
Oil products	Thousands of barrels	24,301	58	14,290	8
CO_2	Thousands of tonnes	3,355	(55)	(41,604)	(128)
Coal and freight	Millions of tonnes	1	(7)	2	(12)
Other commodities		-	8	-	(75)
COMMODITY DERIVATIVES - TRADING		**20,680**	**(66)**	**(35,155)**	**693**

These instruments mainly include contracts included in EDF Trading's portfolio.

18.7.5 Impact of hedging derivatives on comprehensive income

Changes in the fair value of hedging derivatives included in equity (EDF share) and profit and loss are detailed below:

	2020			2019		
(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	(24)	-	-	(39)	(106)	3
Exchange rate hedging	(850)	51	13	(200)	(156)	(17)
Net foreign investment hedging	661	-	-	(416)	(448)	-
Commodity hedging	644	430	(14)	1,482	719	3
HEDGING DERIVATIVES[3]	**431**	**481**	**(1)**	**827**	**9**	**(11)**

(1)+/( ): increase/(decrease) in equity (EDF share).
(2)+/( ): increase/(decrease) in net income (EDF share).
(3)Excluding associates and joint ventures.

The amount transferred to operating profit before depreciation and amortisation in 2020 is €430 million in respect of commodity hedges comprises:

- €818 million for electricity hedging contracts, mainly concerning the United Kingdom and the France - Generation and supply segments,
- €(452) million for gas hedging contracts, concerning the France - Generation and supply segment,
- €64 million for other hedging contracts.

18.7.6 Offsetting of financial assets and liabilities

Accounting principles and methods

A financial asset and financial liability must be netted if the entity currently has a legally enforceable right to do so and intends either to settle the net amount or to realise the asset and settle the liability simultaneously.

At 31 December 2020

(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	**10,477**	**2,956**	11,091	(3,570)	**7,521**	(1,672)	(2,797)	**3,052**
Fair value of derivatives – liabilities	**(7,917)**	**(2,927)**	(8,560)	3,570	**(4,990)**	1,672	568	**(2,750)**

At 31 December 2019

(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	**12,572**	**3,752**	13,300	(4,480)	**8,820**	(1,298)	(3,097)	**4,425**
Fair value of derivatives – liabilities	**(8,157)**	**(3,785)**	(8,852)	4,480	**(4,372)**	1,298	531	**(2,543)**

NOTE 19 FINANCIAL INDICATORS

The financial indicators are not defined by the accounting standards and are not directly visible in the Group's financial statements. The principal financial indicators are the following.

19.1 NET INCOME EXCLUDING NON-RECURRING ITEMS

Net income excluding non-recurring items corresponds to the Group's share of net income (EDF net income) excluding non-recurring items, net changes in the fair value of energy and commodity derivatives (excluding trading activities), and net changes in the fair value of debt and equity instruments, net of tax.

The following tables show the transition from EDF net income to net income excluding non-recurring items:

At 31 December 2020

(in millions of euros)	Notes	2020			
		Gross value	Income taxes	Non-controlling interests	EDF net income
Net income					**650**
Changes in the fair value of debt and equity instruments[1]	8.3	**(1,248)**	**377**	**(2)**	**(873)**
Net changes in fair value on Energy and Commodity derivatives, excluding trading activities	6	**175**	**(51)**	**-**	**124**
Impairment		**1,111**	**(156)**	**(111)**	**844**
- impairment of fixed assets	10.8.1 and 10.8.2	*799*	*(156)*	*(102)*	*541*
- impairment of investments in associates and joint ventures	12.3	*195*	*-*	*(6)*	*189*
- impairment of Edison's E&P operations (application of IFRS 5)	3.2.2	*117*	*-*	*(3)*	*114*
Other items		**809**	**414**	**1**	**1,224**
- other operating income and expenses[2]	7	*487*	*(153)*	*1*	*335*
- tax litigations	9.2	*-*	*537*	*-*	*537*
- change of income tax rate in the UK	9.2	*-*	*121*	*-*	*121*
- accelerated depreciation of thermal power plants in France	10.3	*250*	*(80)*	*-*	*170*
- Other		*72*	*(11)*	*-*	*61*
NET INCOME EXCLUDING NON-RECURRING ITEMS					**1,969**

[1] Including fair value hedges of dedicated assets and changes in the fair value of debt and equity instruments comprised in investments in associates and joint ventures.

[2] In 2020 other income and expenses notably include exceptional additional costs relating to repair work on the main secondary circuit welds in the Flamanville 3 EPR, totalling €(397) million.

The net income excluding non-recurring items amounts to €1,969 million at 31 December 2020, down by €1,902 million compared to 2019.

At 31 December 2019

(in millions of euros)	Notes	2019 Gross value	Income taxes	Non-controlling interests	EDF net income
Net income					**5,155**
Changes in the fair value of debt and equity instruments[1]	8.3	**(2,703)**	**923**	**-**	**(1,780)**
Net changes in fair value on Energy and Commodity derivatives, excluding trading activities	6	**(642)**	**152**	**-**	**(490)**
Impairment		**989**	**(70)**	**(36)**	**883**
- impairment of fixed assets	10.8.1 and 10.8.2	*403*	*(70)*	*(23)*	*310*
- impairment of investments in associates and joint ventures	12.3	*73*	-	-	*73*
- impairment of Edison's E&P operations (application of IFRS 5)	3.2.2	*513*	-	*(13)*	*500*
Other items		**269**	**(172)**	**6**	**103**
- other operating income and expenses[2]	7	*185*	*(144)*	*6*	*47*
- accelerated depreciation of thermal power plants in France	10.3	*141*	*(49)*	-	*92*
- Other		*(57)*	*21*	-	*(36)*
NET INCOME EXCLUDING NON-RECURRING ITEMS					**3,871**

[1] Including fair value hedges of dedicated assets and changes in the fair value of debt and equity instruments comprised in investments in associates and joint ventures.
[2] In 2019 other income and expenses principally comprised the €(30) million cost of the ERO employee shareholding offer, restructuring expenses in certain entities, and other operations of non-significant amounts individually.

19.2 NET INDEBTEDNESS

Net indebtedness comprises total loans and financial liabilities, less cash and cash equivalents and liquid assets. Liquid assets are financial assets consisting of funds or 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.

Net indebtedness are as follows:

(in millions of euros)	Notes	31/12/2020	31/12/2019
Loans and other financial liabilities	18.3.2	65,591	67,380
Derivatives used to hedge liabilities	18.7.1	(1,986)	(3,387)
Cash and cash equivalents	18.2	(6,270)	(3,934)
Debt and equity securities – liquid assets	18.1.2	(15,028)	(18,900)
Net indebtedness of assets held for sale	3.2.1	(17)	(26)
NET INDEBTEDNESS		**42,290**	**41,133**

The Group's net indebtedness amounts to €42,290 million at 31 December 2020 (€41,133 million at 31 December 2019). The ratio of net indebtedness to operating proft before depreciation and amortisation at 31 December 2020 is 2.61.

NOTE 20 SUSTAINABLE DEVELOPMENT AND CLIMATE ACTION

In coherence with its *raison d'être*, "To build a net zero energy future with electricity and innovative solutions and services, to help save the planet and drive wellbeing and economic development", in February 2020 the EDF Group, along with more than 300 other companies worldwide (as of December 2020), signed up to the "Business Ambition for 1.5 degrees" commitment to achieve carbon neutrality, a target set in line with the Paris Climate Agreement.

Following this commitment, on the fifth anniversary of the Paris Climate Agreement, the Group's reinforced CO_2 emission-cutting trajectory was officially validated by the Science Based Targets initiative as "well below 2°C", and it set up dedicated governance arrangements aligned with best practices as recommended by the Taskforce on Climate-Related Financial Disclosure (see the press release of 10 December 2020).

The Group's financial statements reflect issues relating to climate change and sustainable development through the implementation of its investment and divestment strategy and a sustainable financing strategy, through expenditure incurred specifically in response to environmental issues, particularly under applicable laws and regulations, and also through the valuation methods used for the Group's assets and liabilities.

20.1 REGULATORY EXPENSES

The regulatory frameworks and accounting principles for greenhouse gas emission rights, renewable energy certificates and energy savings certificates are presented in notes 5.4.3, 10.2 and 17.2.

20.1.1 Greenhouse gas emission rights

The European Union's Emissions Trading System (EU ETS) exists to fight climate change and reduce greenhouse gas emissions.

This system, which has been incorporated into national laws, sets an annual cap on emissions. Businesses (including EDF) receive or buy emission quotas, then the following year surrender to the European Commission a number of greenhouse gas emission rights corresponding to their emissions for the year elapsed. Fines are payable if there is a shortfall (110€ per tonne of CO_2 not covered by quotas, and an obligation to cover these amounts by quota the following year).

The cap is being progressively reduced in order to bring down the total emissions in Europe.

One of the main features of the third phase of the ETS (2013 to 2020) is the discontinuation of free allocation of emission rights to electricity producers in all EU countries (except certain Eastern European countries which, subject to approval from the European Commission, were allowed to give away some of their quotas free of charge).

The legislative framework of the EU-ETS for the next trading period (phase 4: 2021-2030) was revised in early 2018 to contribute to achievement of emission reduction targets in line with the 2030 Climate and Energy framework and the EU's contribution to the Paris Climate Agreement adopted in 2015. Key measures of the revision were increasing the reductions in quotas to 48 million tonnes per year (2.2% lower than the 2010 allocations), continuing free allocation of quotas within certain limits for sectors exposed to risks of carbon leakage and the electricity sector in highly coal-dependent countries, subject to certain criteria. In France, the Energy and Climate law of 8 November 2019 introduced a cap on greenhouse gas emissions, applicable from 1 January 2022.

In the EDF group, the entities concerned by application of this directive are EDF, EDF Energy, Edison, Dalkia, PEI and Luminus.

The Group's total emission rights allocation in 2020 for Scope 1, i.e. direct greenhouse gas emissions from electricity and heat production, recorded in the EU-ETS Transaction Log, was 0 million tonnes (1 million tonnes for 2019).

The volume of emissions at 31 December 2020 stood at 19 million tonnes (21 million tonnes for 2019).

Over-quota greenhouse gas emissions by the Group amount to €260 million at 31 December 2020 (€414 million at 31 December 2019), and are recorded in balance sheet provisions.

Greenhouse gas emissions are a component of intangible assets related to environmental regulations, and had a net value of €769 million at 31 December 2020.

In compliance with the obligation to surrender a number of greenhouse gas emission rights equivalent to its emissions, in 2020, according to the best estimate, the Group surrendered 21 million tonnes under the EU-ETS scheme in respect of emissions generated in 2019 (In 2019, it surrendered 26 million tonnes of emission rights in respect of emissions generated in 2018.

20.1.2 Renewable energy certificates (green certificates)

To encourage use of renewable energy produced from renewable sources, every EU member state has set itself national targets for consumption of electricity from renewable sources. Guarantee of Origin certificates prove the renewable origins of the electricity, which transits through the grid. They are sold by operators of renewable energy plants and bought by customers who want to use renewable-source electricity.

There are two ways for States to meet their targets:

- incorporating the costs of these certificates into the sale price for electricity (this is the approach taken in France);
- introducing an obligation to surrender a certain volume of renewable energy certificates depending on the level of sales to customers (as is the case in the United Kingdom, Italy and Belgium).

The renewable energy certificate system may apply to:

- non-obligated electricity producers when the obligation applies to sales (EDF Renewables);

- obligated electricity producers when the obligation applies to generation;
- electricity producers who are also sellers of electricity when the obligation applies to energy sales (EDF Energy, Edison and Luminus).

A provision of €932 million was recognised at 31 December 2020 concerning the obligations for renewable energy certificates to be surrendered at that date, essentially by EDF Energy (United Kingdom) and Luminus (Belgium). A large portion of these obligations are covered by purchased certificates recorded in intangible assets.

20.1.3 Energy Savings Certificates

In all its subsidiaries, the Group is engaged in a process to control its energy consumption through various measures developed by national legislation in application of European Union Directives.

In the United Kingdom for example, EDF Energy helps companies explore and develop solutions by enabling them to save energy, carbon and costs, particularly through its Powershift flexibility platform.

In France, the Law of 13 July 2005 introduced a system of energy savings certificates, imposing energy savings obligations on suppliers of energy (electricity, gas, heat, cold, domestic fuel oil and fuel for vehicles) with sales above a certain level. At the end of the period concerned, obligated actors are required to present energy savings certificates that correspond to their obligatory energy savings, otherwise sanctions apply. These certificates are obtained in return for energy savings operations conducted directly or indirectly, or purchased from other obligated or "eligible" economic actors.

On 1 January 2018 the energy savings certificates scheme began its fourth period, extended by one year to last 4 years. The EDF group has three sources of action to meet this obligation: supporting consumers in energy efficiency operations, for instance by carrying out renovations (277,000 renovation projects were completed in 2020, 20% more than in 2019), funding State-approved programmes, and purchasing certificates from eligible actors.

At 31 December 2020, the Group is confident that it can fulfil its obligations.

20.2 VALUATION OF ASSETS AND LIABILITIES

20.2.1 Provisions for environmental risks

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. Obligations can vary noticeably depending on each country's legislation and regulations, and the technologies and industrial scenarios involved. Details of these provisions are provided in notes 15 and 17.

Provisions related to environmental schemes include provisions for greenhouse gas emission rights, renewable energy certificates and energy savings certificates. In 2020, these provisions totalled €1,192 million (€1,517 million in 2019, see note 17.2).

Contingent liabilities also exist in connection with environmental litigation, such as the dispute concerning the Ausimont SpA industrial complex. These liabilities are described in note 17.3.

20.2.2 Valuation of assets

Climate issues are taken into account in valuing long-term assets through impairment testing. The long-term scenarios used for electricity prices in countries where the Group does business are consistent with the trajectories of European decarbonisation targets, particularly as set in the Paris climate agreement (see note 10.8).

Significant impairment has been booked on most of the thermal assets controlled by the Group in recent years (see note 13 to the consolidated financial statements at 31 December 2015 and similar notes to the financial statements of subsequent years).

20.3 SUSTAINABLE FINANCING

20.3.1 Green Bonds

Since 2013 the Group has made five Green Bond issues for a value equivalent to €4.5 billion, in order to support its development in renewable energies. It has invested around €2.5 billion per year to such operations.

After the two green bond issues chiefly intended to finance the building of new wind and solar power projects by its subsidiary EDF Renewables (€1.4 billion in November 2013 and $1.25 billion in October 2015), the Group expanded its Green Bond Framework to finance investments in the renovation and modernisation of its hydropower assets in mainland

France.

The new Framework was first applied to a €1.75 billion issue in October 2016 and then to a JPY 26 billion issue in two tranches in January 2017. The Group extended the scope of its Green Bond Framework further in early 2020 by opening it up to international hydropower assets, energy efficiency projects and biodiversity conservation projects

On 8 September 2020, EDF made a landmark offering of unsecured senior green bonds convertible into new shares and/or exchangeable for existing shares of the Company (*OCEANEs Vertes*) maturing in 2024, for the nominal amount of approximately €2.4 billion.

This was the largest convertible bond issue in Europe since 2003 (excluding bonds redeemable in shares), the largest convertible green bond issue ever undertaken, and the largest green bond issue ever by a European corporate issuer.

The Green Bonds are included in the group's borrowings, see note 18.3.2. Allocation of the funds raised by EDF's green bond issues is certified by one of the statutory auditors: see section 6.7 of the Universal Registration Document.

20.3.2 Credit lines indexed on ESG criteria

The EDF group is strongly committed to corporate social responsibility (CSR) and advocates closer ties between non-financial performance and financing strategy.

The credit lines indexed to the Group's sustainable development performance incorporate a cost adjustment mechanism.

EDF SA has a €4 billion syndicated credit line with more than 20 banks that incorporate a margin adjustment mechanism linked to Group performance on three KPIs: direct CO_2 emissions, French residential customers' use of online consumption monitoring tools, and electrification of EDF's light vehicle fleet.

The Group has also signed 7 renewable bilateral credit lines indexed on ESG criteria (incorporating a cost adjustment mechanism based on the Group's performance on certain KPIs or its rating by a nonfinancial ratings agency), amounting to a total €1.6 billion.

At 31 December 2020, ESG-indexed renewable credit lines, which were undrawn, totalled over €5.6 billion, or 51% of the EDF group's total undrawn credit facilities (see note 18.4).

The selected KPIs reflect the EDF group's major environmental commitments, principally cutting greenhouse gas emissions (CO_2) by 50% by 2030, closing down coal-fired plants in France and the United Kingdom with a view to achieving carbon neutrality by 2050, and completing electrification of the whole EDF group vehicle fleet by 2030. The focus on consumption monitoring tools reflects the Group's ambition to provide its customers with energy solutions appropriate to their needs.

They are a concrete illustration of EDF's raison d'être, which was enshrined in the Group's articles of association in May 2020.

20.4 SUSTAINABLE INVESTMENT, RESEARCH AND DEVELOPMENT, AND OTHER EXPENDITURE FOR PROTECTION OF THE ENVIRONMENT AND THE CLIMATE

20.4.1 Sustainable investment

In 2020 the Group continued its programme of gross operating investments, which amounted to €16.5 billion gross and included €16 billion of gross investments in intangible assets and property, plant and equipment (see notes 4 and 10.7) and €0.5 billion of gross financial investments.

As part of its work on the European taxonomy for sustainable activities, the Group has estimated its rate of gross operating investments validated as green by the European Union. Under the chosen methodology these investments do not include gross financial investments or "corporate" investments such as renewal of IT equipment or vehicle fleets.

In 2020, close to 94% of the Group's investments met its low-carbon objectives: 51% of investments concerned the nuclear sector, and 43% were compliant with the European taxonomy for sustainable activities (by a method currently based on the Technical Expert Group report of March 2020) notably including production of renewable energies (e.g. hydropower, wind and solar power), networks, and energy services. These figures are likely to be revised in the light of changes in "Taxonomy" regulations, particularly when the delegated acts are published in 2021. The low-carbon investment strategy is also reflected in the objective of converting some of the Group's coal or oil-fired units to low-carbon generation methods.

With the Ecocombust project in France, the Group's main objective is to optimise the performance by all of its fossil-fired plants by making innovative, ecological fuel that can be used in heating or electricity-generating installations that currently run on coal. If satisfactory results are achieved by the technical trials and impact studies required under the preliminary work programme validated by EDF and the Ministry for the Ecological and Inclusive Transition, EDF will aim to begin industrial production of this new fuel in 2022. The fuel would then be used for co-firing, with a minority coal component, in the Cordemais plant's boilers from 2022.

EDF is also playing a part in the energy transition through investments in new activities. In 2017, the EDF group created its start-up incubator EDF Pulse Croissance, to explore the ecological and digital transition and provide its clients with innovative, competitive offerings and services. EDF Pulse Croissance is part of the Group's CAP 2030 strategy to develop a portfolio of assets focusing on carbon-free energy, services for customers and decentralised energy solutions.

In 2019 EDF Pulse Croissance invested in start-ups and formed subsidiaries that developed out of entrepreneurial projects. One of these is Hynamics, a subsidiary dedicated to the production and marketing of low-carbon hydrogen from water electrolysis, to meet the needs of industry and heavy-duty transport. Hynamics is also contributing to installing a network of hydrogen charging points across France for heavy-duty electric vehicles such as trains, buses, refuse collection trucks, commercial vehicles and river transport vessels.

As a consequence of the multi-year energy programme (PPE) fixing a final deadline of 2026 for the discontinuation of coal-fired power generation in France, and also due to the Ecocombust project, the ends of the depreciation periods for the Le Havre and Cordemais plants were changed in the first half of 2019 and set at 2021 for Le Havre and 2026 for Cordemais (for Cordemais, the date could still change depending on final decisions to be made about the Ecocombust project).

The Group is also taking action under the PPE for the French island territories, which plans a progressive conversion to liquid biomass for plants that currently run on fuel oil.

Another reflection of the EDF Group's commitment to achieving carbon neutrality by 2050 is the management policy applied to its portfolio of dedicated assets held to finance long-term nuclear expenses in France (€33.8 billion at 31 December 2020). The group has drawn up a responsible investor's charter covering three areas (compliance with the United Nations' Principles for Responsible Investment; respect of the major international agreements on human rights; and an annual report on responsible investments). This charter is applicable both to assets managed directly and assets managed by specialist companies under delegated management arrangements.

In addition, on 17 December 2020, the Group finalised the sale of its Exploration and Production operations to Energean (see notes 1.4.2 and 3.1). The progressive disposal of the hydrocarbons Exploration and Production (E&P) operations is consistent with the priorities of the CAP 2030 strategy.

20.4.2 Research and development (R&D)

Given the goal of carbon neutrality by 2050, and the fact that electricity is a major lever in action to decarbonise the French economy, R&D has a crucial role to play in the electricity, climate, digital and societal transition.

In 2020, the EDF group's total R&D expenditure amounted to €685 million, and EDF's R&D budget for environmental protection was €79 million.

R&D expenditure is particularly channelled into research into energy efficiency, uses of electricity as a substitute for fossil fuel-based energies, renewable energies and their insertion into the grid, energy storage, carbon-free hydrogen and its applications for decarbonising the economy, sustainable cities, the local impacts of climate change and other environmental issues such as biodiversity, water quality, and the mitigation of all forms of pollution.

Research concerning electricity storage, enhancement of energy performance diagnosis methods, improvement of techniques for urban heating and cooling networks, platforms for sharing studies relevant to the ecological transition, and increasing safety at nuclear power plants is supported by public subsidies, notably from the European Union.

Accounting principles and methods for R&D are presented in note 10.2.

20.4.3 Other expenses for protection of the environment and climate

Accounting principles and methods

Other expenses for protection of the environment and climate are identifiable expenses incurred to prevent, reduce or repair damage 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 (e.g. expenses for structures to facilitate the passage of migrating fish, effluent treatment installations, etc);
- 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 units 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.

All of the Group's functions, employees, activities and projects are mobilised to fulfil EDF's objective of being an environmentally responsible company. Some of the actions concerned are presented below.

Action for biodiversity

The Group takes action associated with France's national biodiversity plan, promoting a positive approach to biodiversity. For example, through its subsidiary EDF Hydro and its hydroelectricity activities, between 2013 and 2020 the Group undertook more than 50 operations to facilitate fish migration at ecologically sensitive sites in mainland France ("list 2" sites for the purposes of the national law on water and aquatic environments), installing fish passes and fish ladders and removing river weirs. These operations benefited from subsidies from the national water agencies.

Action for employees and vehicle fleet electrification

Consistent with its ambitions for the environment and the climate, the Group works to raise awareness among its employees and educate them about environmental and sustainable development issues. In 2020 its "Environment and sustainable development" training offering comprising courses on environmental management, standards and regulations, and environmental analysis, provided 1,545 employees with 12,710 hours of training.

In addition, the rollout at Group level of the "Climate Collage" collaborative workshop, led in person or online by 173 volunteer employees after internal training, gave 3,061 employees greater awareness of the issues of climate disruption.

Furthermore, sustainable and digital development indicators have been introduced that account for 20% of the 2020 employee profit share criteria. These indicators reflect efforts made to reduce paper printouts, and achievement of the "carbon-neutrality passport" training certificate.

As the first French Group to sign the EV100 initiative, EDF made a commitment to have a fully-electric light vehicle fleet by 2030. In 2020 the worldwide fleet numbered slightly more than 45,000 light vehicles (especially in Europe) and more than 12.2% were already electric (over 5,500 electric vehicles, an increase of more than 1,700 from 2019). Joining the EV100 initiative is also an encouragement for Group employees to control their energy consumption and reduce their carbon footprint, as it gives them access to a special agreement with car suppliers and offers for recharging services sold by EDF subsidiaries.

NOTE 21 OFF-BALANCE SHEET COMMITMENTS

This note presents off-balance sheet commitments given and received by the Group at 31 December 2020. The amounts of commitments correspond to non-discounted contractual values.

21.1 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	31/12/2020	31/12/2019
Operating commitments given	21.1.1	42,235	41,110
Investment commitments given	21.1.2	16,494	18,237
Financing commitments given	21.1.3	5,536	6,343
TOTAL COMMITMENTS GIVEN		**64,265**	**65,690**

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.

21.1.1 Operating commitments given

Operating commitments given by the Group are as follows:

(in millions of euros)	31/12/2020	31/12/2019
Fuel and energy purchase commitments[(1)]	24,715	25,373
Operating contract performance commitments given	17,151	15,248
Operating lease commitments as lessee	369	489
TOTAL OPERATING COMMITMENTS GIVEN	**42,235**	**41,110**

(1) Excluding gas purchases and related services

21.1.1.1 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 2020, fuel and energy purchase commitments mature as follows:

	31/12/2020					31/12/2019
	Total	Maturity				Total
(in millions of euros)		< 1 year	1 to 5 years	5 to 10 years	> 10 years	
Electricity purchases and related services[1]	10,574	2,562	4,123	2,121	1,768	9,999
Other energy and commodity purchases[2]	308	64	124	120	-	281
Nuclear fuel purchases	13,833	1,610	5,870	4,374	1,979	15,093
FUEL AND ENERGY PURCHASE COMMITMENTS	**24,715**	**4,236**	**10,117**	**6,615**	**3,747**	**25,373**

[1] Including commitments given by controlled entities to joint ventures, amounting to €533 million at 31 December 2020 (€569 million at 31 December 2019).
[2] Excluding gas purchases and related services (see note 21.1.1.1.4).

21.1.1.1.1 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 59TWh for 2020 (57TWh for 2019), including 7TWh for co-generation (7TWh for 2019), 31TWh for wind power (30TWh for 2019), 11TWh for photovoltaic power (11TWh for 2019) and 4TWh for hydropower (3TWh for 2019).

21.1.1.1.2 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.

21.1.1.1.3 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.

21.1.1.1.4 Gas purchases and related services

Gas purchase commitments are principally undertaken by Edison and EDF. The volumes concerned for both entities at 31 December 2020 are as follows:

	31/12/2020				31/12/2019
	Total	Maturity			Total
(in billions of m^3)		< 1 year	1 to 5 years	> 5 years	
Edison	124	12	44	68	135
EDF	26	2	8	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 12.4 billion m3 per year. The residual terms of these contracts vary between 1 and 14 years.

The contract with Algeria was renewed in 2019 for 1 billion m3 per year until 2027. The long-term contract for gas from Russia terminated in 2019 and Edison signed a new contract for 1 billion m3 for 2020, then for 2021.

These contracts contain "take-or-pay" clauses committing the buyer to pay for a minimum volume of gas every year, whether or not it actually takes delivery of that volume. At 31 December 2020, off-balance sheet commitments relating to

Edison's take-or-pay clauses amount to €117 million, corresponding to the value of the volumes of gas not withdrawn at that date and for which delivery is deferred to a subsequent period.

EDF has entered into an import contract for LNG from the United States, concerning an annual supply of 0.7 million tonnes of LNG (1 billion m3 of natural gas per year) for a 20-year period beginning in May 2020.

In 2020, EDF signed a new 5-year contract for 3 billion m3 from Norway.

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.

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 contracts has been recorded in connection with this contract.

Other commitments and risks

Edison has signed two significant purchase contracts for gas from Azerbaijan (1 billion m3 per year), with deliveries scheduled to start in 2021, and LNG from the United States (1 million tonnes per year), with deliveries scheduled to start in 2023.

21.1.1.2 Operating contract performance commitments given

At 31 December 2020, these commitments mature as follows:

	31/12/2020				31/12/2019
	Total	Maturity			Total
(in millions of euros)		< 1 year	1 to 5 years	> 5 years	
Operating guarantees given	9,185	2,320	2,711	4,154	7,349
Operating purchase commitments[1]	7,720	4,359	2,732	629	7,594
Other operating commitments	246	92	87	67	305
OPERATING CONTRACT PERFORMANCE COMMITMENTS GIVEN[2]	**17,151**	**6,771**	**5,530**	**4,850**	**15,248**

[1] Excluding fuel and energy

[2] Including commitments given by controlled entities to joint ventures, amounting to €1,714 million at 31 December 2020 (€1,019 million at 31 December 2019).

In the course of its business, the Group provides contract performance guarantees, generally through the intermediary of banks.

Operating guarantees given at 31 December 2020 mainly consist of guarantees given by EDF, Edison and EDF Renewables in connection with its development projects.

The change in these guarantees is essentially explained by new EDF Renewables projects in development (particularly in the United States) and by the higher parent company guarantee given by EDF covering the differential between the value of UK pension obligations under the Trustees' method and under IAS 19.

21.1.1.2.1 Operating guarantees given

Operating guarantees given are as follows:

(in millions of euros)	31/12/2020	31/12/2019
EDF	2,496	2,081
EDF Renouvelables	2,447	1,612
Edison	1,657	1,319
EDF Energy	1,055	912
Framatome	573	552
Other entities	957	873
TOTAL	**9,185**	**7,349**

21.1.1.2.2 Operating purchase commitments

Operating purchase commitments are as follows:

(in millions of euros)	31/12/2020	31/12/2019
EDF	3,524	3,028
Framatome	1,659	1,880
Enedis	845	829
EDF Energy	591	613
Other entities	1,101	1,244
TOTAL	**7,720**	**7,594**

21.1.1.3 Lease commitments as lessee

At 31 December 2020, lease commitments as lessee break down as follows:

	31/12/2020				31/12/2019
	Total	Maturity			Total
(in millions of euros)		< 1 year	1 to 5 years	> 5 years	
LEASE COMMITMENTS AS LESSEE	**369**	**54**	**181**	**134**	**489**

The only remaining off-balance sheet lease commitments are:

- Leases that are exempt from recognition in application of IFRS 16. The total amount concerned at 31 December 2020 is €191 million (€211 million at 31 December 2019);
- Leases of assets that have not yet been made available to the Group (principally real estate and LNG tankers under construction). The right-of-use assets and the lease liability will be recognised in the balance sheet when the leased asset is made available. The total amount concerned at 31 December 2020 is €178 million (€278 million at 31 December 2019).

21.1.2 Investment commitments given

At 31 December 2019, details of investment commitments are as follows:

	31/12/2020				31/12/2019
	Total	Maturity			Total
(in millions of euros)		< 1 year	1 to 5 years	> 5 years	
Commitments related to acquisition of tangible and intangible assets	15,625	8,650	6,459	516	17,430
Commitments related to acquisition of financial assets	716	95	523	98	583
Other commitments related to investments	153	143	10	-	224
TOTAL INVESTMENT COMMITMENTS GIVEN[(1)]	**16,494**	**8,888**	**6,992**	**614**	**18,237**

[(1)] Including commitments given by controlled entities to joint ventures, amounting to €212 million at 31 December 2020 (€265 million at 31 December 2019).

21.1.2.1 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)	31/12/2020	31/12/2019
EDF	4,284	4,654
EDF Energy	5,966	6,466
Enedis	2,461	2,555
EDF Renouvelables	1,369	2,437
Framatome	462	517
Other entities	1,083	801
TOTAL	**15,625**	**17,430**

The decrease in commitments given related to acquisition of tangible and intangible fixed assets is mainly explained by progress on many projects developed by EDF Renewables in the United States and Brazil, and the lower commitments by

EDF Energy, mainly due to the effect of the depreciation of the pound sterling against the euro. The decrease in Enedis' commitments is due to the continued rollout of Linky meters.

New contracts were signed by EDF PEI in 2020 in connection with the Larivot power plant project in Guyana (a renewable-energy plant using liquid biomass, developed as part of the multi-year energy plan).

21.1.2.2 Commitments related to acquisition of financial assets

The main share purchase commitments that cannot be valued concern Luminus.

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 2020, the fair value of these trading derivatives is not significant.

On 7 December Framatome signed a final purchase contract with Rolls Royce to acquire its Civil Nuclear Instrumentation and Control (I&C) activity. The transaction should be completed early in the second half of 2021, subject to customary conditions including regulatory approvals.

21.1.2.3 Other commitments related to investments

Other commitments given related to investments at 31 December 2020 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.

21.1.3 Financing commitments given

Financing commitments given by the Group at 31 December 2020 comprise the following:

	31/12/2020				31/12/2019
	Total	Maturity			Total
(in millions of euros)		< 1 year	1 to 5 years	> 5 years	
Security interests in real property	4,179	90	2,246	1,843	4,587
Guarantees related to borrowings	949	51	495	403	1,314
Other financing commitments	408	364	6	38	442
TOTAL FINANCING COMMITMENTS GIVEN[1]	**5,536**	**505**	**2,747**	**2,284**	**6,343**

[1] Including commitments given by controlled entities to joint ventures, amounting to €1,156 million at 31 December 2020 (€1,225 million at 31 December 2019). 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.

21.2 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	31/12/2020	31/12/2019
Operating commitments received[1]	21.2.1	8,108	9,291
Investment commitments received	21.2.2	132	181
Financing commitments received	21.2.3	31	22
TOTAL COMMITMENTS RECEIVED[2]		**8,271**	**9,494**

[1]Excluding commitments related to supplies of energy and related services (see note 21.2.1.4)
[2]Excluding commitments related to credit lines, which are described in note 18.4.

21.2.1 Operating commitments received

Operating commitments received by the Group at 31 December 2020 comprise the following:

	31/12/2020				31/12/2019
	Total	Maturity			Total
(in millions of euros)		< 1 year	1 to 5 years	> 5 years	
Operating lease commitments as lessor	711	114	355	242	770
Operating sale commitments	5,903	1,490	3,457	956	6,706
Operating guarantees received	1,444	1,195	161	88	1,756
Other operating commitments received	50	18	15	17	59
OPERATING COMMITMENTS RECEIVED	**8,108**	**2,817**	**3,988**	**1,303**	**9,291**

21.2.1.1 Operating lease commitments as lessor

In 2020, the Group benefits from commitments as lessor in operating leases amounting to €711 million.

These commitments mainly concern the Asian Independent Power Projects (IPPs) and real estate leases.

21.2.1.2 Operating sale commitments

Operating sale commitments received exclude energy deliveries and 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).

21.2.1.3 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.

21.2.1.4 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 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 150TWh each year until 31 December 2025.

21.2.2 Investment commitments received

	31/12/2020				31/12/2019
	Total	Maturity			Total
(in millions of euros)		< 1 year	1 to 5 years	> 5 years	
INVESTMENT COMMITMENTS RECEIVED	**132**	**14**	**118**	**-**	**181**

21.2.3 Financing commitments received

(in millions of euros)	31/12/2020				31/12/2019
	Total	Maturity			Total
		< 1 year	1 to 5 years	> 5 years	
FINANCING COMMITMENTS RECEIVED	31	2	19	10	22

NOTE 22 RELATED PARTIES

Accounting principles and methods

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.

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)	31/12/2020	31/12/2019	31/12/2020	31/12/2019	31/12/2020	31/12/2019	31/12/2020	31/12/2019
Sales	355	455	-	-	2,082	1,889	2,437	2,344
Energy purchases	3,885	4,063	1	4	2,114	2,104	6,000	6,171
External purchases	13	18	7	3	348	253	368	274
Financial assets	179	150	-	-	-	-	179	150
Other assets	495	633	-	-	593	532	1,088	1,165
Financial liabilities	-	-	-	-	-	-	-	-
Other liabilities	1,114	1,228	1	1	600	624	1,715	1,853

[1] *Excluding tax and social liabilities and the CSPE receivable.*

22.1 TRANSACTIONS WITH ENTITIES INCLUDED IN THE SCOPE OF CONSOLIDATION

Transactions with the principal associates (CTE (the company that owns RTE), CENG and Taishan) are presented in note 12.

Transactions with other associates, joint ventures, and partner entities in joint arrangements with the Group mainly consist of sales and purchases of energy.

22.2 RELATIONS WITH THE FRENCH STATE AND STATE-OWNED ENTITIES

22.2.1 Relation with French State

The French State holds 83.68% of the capital of EDF at 31 December 2020, 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.

22.2.2 Relations with GRDF

Enedis and GRDF have an agreement that defines their relations for provision of certain common services and the resulting division of costs, under Article L. 111-71 of the French Energy Code.

In the gas and electricity distribution sector, this agreement covers work related to plant construction, site project management, and network operation and maintenance. It is updated regularly.

In 2018, Enedis and GRDF reorganised some of their joint operations by creating two mixed entities: one handles employment contracts, studies and medical/social matters and the other is the IT and telecoms operator for all telephone and office technology activities. These two entities took effect from 1 January 2019.

The support functions for Real Estate, Vehicles and Machines, Litigation and Insurance, Training and Recruitment, and Office purchases, which were previously combined, are now handled separately by each of the two companies.

In July 2020, Enedis and GRDF decided to initiate a shared project for transformation of their common activities (*Transformation des Activités* Communes or TAC), with the aim of ending co-employability in the activities that remain mixed: equipment procurement and logistics, employment contracts, medical/social matters, housing management, IT and telecommunication for offices, and accounting.

Concerning the common service of LPG distribution and supply in the cities of Ajaccio and Bastia in Corsica, ENGIE informed EDF in October 2020 that it was considering terminating its LPG activities in Corsica on 31 March 2021 (its concession agreements ended in the 1990s). The same month, the city of Ajaccio launched a call for tenders for the LPG distribution concession and ENGIE submitted a bid. The city of Bastia also announced that it would launch a call for tenders. The 1951 agreement stipulates the terms for exchanges of information between EDF and ENGIE regarding the reciprocal impacts of their decisions.

22.2.3 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;
- for fluoration, enrichment of natural uranium into uranium 235: an Orano Conversion-Enrichissement contract (formerly Orano cycle contract).

In connection with the plan to construct two EPRs in the UK at the Hinkley Point site, on 29 September 2016 EDF and Orano signed a uranium contract with Orano Mining, and a conversion contract and an enrichment contract with Orano Conversion-Enrichissement.

Back-end of the cycle

Relations between EDF and Orano Recyclage concerning transportation, processing and recycling of spent fuels are described in note 15.1.1.1.

22.3 MANAGEMENT COMPENSATION

The Company's key management and governance personnel are the Chairman and CEO, the members of the COMEX (Executive Committee) throughout 2020 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 €11.9 million in 2020 (€12.6 million in 2019). 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.

NOTE 23 SUBSEQUENT EVENTS

No developments have occurred since the year-end in addition to those presented in other notes.

NOTE 24 STATUTORY AUDITORS' FEES

The following table sets forth the fees paid for work done by the Statutory Auditors and their network during 2020:

(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	2,794	24.6	2,945	16.2
Controlled entities[1]	4,560 [3]	40.1	13,503	74.2
Sub-total	**7,354**	**64.7**	**16,448**	**90.4**
Non-audit services[2]				
EDF	561	4.9	953	5.2
Controlled entities[1]	3,448	30.4	804	4.4
Sub-total	**4,009**	**35.3**	**1,757**	**9.6**
TOTAL	**11,363**	**100**	**18,205**	**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.
[3]The decrease results from a transfer between audit firms with no impact on the overall level of fees to the Group's auditors, and a change of statutory auditor for a significant French entity in the Group, which is now audited by the Group's statutory auditors and another audit firm.

Statutory Auditors' fees for 2019

The following table sets forth the fees paid for work done by the Statutory Auditors and their network during 2019:

(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	2,709	19.2	2,822	17.1
Controlled entities[1]	8,104	57.4	11,654	70.6
Sub-total	**10,813**	**76.6**	**14,476**	**87.7**
Non-audit services[2]				
EDF	883	6.3	867	5.3
Controlled entities[1]	2,425	17.1	1,152	7.0
Sub-total	**3,308**	**23.4**	**2,020**	**12.3**
TOTAL	**14,121**	**100**	**16,496**	**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.