MOODY'S
INVESTORS SERVICE

CREDIT OPINION
26 January 2022

Update

Rate this Research

RATINGS

Electricite de France

Domicile	Paris, France
Long Term Rating	A3
Type	LT Issuer Rating
Outlook	Stable

Please see the ratings section at the end of this report for more information. The ratings and outlook shown reflect information as of the publication date.

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Electricite de France

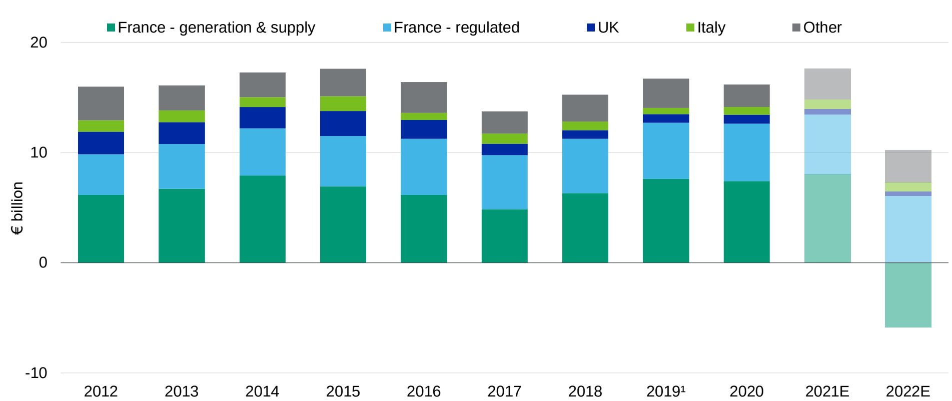
Update following placement of ratings under review for downgrade

Summary

Electricite de France's (EDF, A3 RuR) credit quality is underpinned by the scale and breadth of its activities in France, which account for more than two-thirds of its EBITDA; the rising contribution to earnings from its domestic regulated activities and renewables business, which together account for around 37% of group EBITDA in 2020; and its geographical diversification, given its sizeable market shares in Italy and in the United Kingdom (UK). These positives are balanced by its fixed-cost merchant power generation in France and the UK, which exposes it to power price volatility; increasing competition in the French supply market; a significant capital spending programme which results in negative FCF; and the construction risk associated with the construction of new nuclear reactors in France and in the UK.

The ratings were placed under review for downgrade on January 17, 2022 following the January 13 announcement by the Government of France (Aa2 stable) of measures to limit the increase in electricity tariffs for 2022 and EDF's reduction of its nuclear output estimate for 2022, announced on the same date.[1] The rating review will consider the impact of the planned measures on EDF's financial profile in the context of the lower output, mitigating measures that the company may pursue and any additional support that government may provide.

Exhibit 1
ARENH rising cap will negatively affect the Generation and Supply activities in France in 2022



The 2021 and 2022 estimates represent Moody's forward view, not the view of the issuer.
[1] Application of IFRS 16 from 2019.
Sources: Company reports and Moody's Investors Service

The A3 rating incorporates two notches of uplift from government support, given the company's 83.77% ownership by the Government of France.

Credit strengths

» Leading electric utility in France

» Regulated activities and geographical diversification, which support cash flow stability

» Support from the French government, given its 83.77% ownership in the company

Credit challenges

» High volumes of fixed-cost, low-emission merchant power generation in France and the UK, which expose the company to power price volatility

» Significant capital spending programme, which results in persistently negative FCF

» Incremental risks associated with the nuclear fleet's ageing resulting in longer outages and reduced availability in France

» Political concerns about affordability to the detriment of EDF's economic interests

» Limited visibility into a potential restructuring of EDF, given linkages to political considerations and uncertainties in the context of general elections in April 2022

» Increasing competition in the French supply market, which could justify an increase of the ARENH (*Accès régulé à l'électricité nucléaire historique*) ceiling to 150 TWh

» Construction risk associated with the Flamanville 3 and HPC nuclear power plant projects in France and the UK

Rating outlook

The ratings have been placed on review for downgrade, reflecting the planned ARENH changes and lower output that will result in significant costs for EDF.

The review will focus on the likely cost and the impact of any mitigation measures on EDF's business risk profile and credit metrics as well as the commitment of government of France to further support the group, in the context of its c. 84% ownership. In concluding the review, we will consider (1) the nature and importance of mitigants EDF has said it will announce on 18 February 2022; (2) French government policy with regards to the ARENH mechanism; and (3) the result of the ongoing nuclear fleet audit and the implications of the fleet ageing for its sustainable availability. Moody's will endeavour to conclude the review by mid March 2022.

Factors that could lead to an upgrade

The ratings could be confirmed if (1) the costs associated with the increase in the ARENH ceiling, reduced output, and the potential increase in political risk appear likely to be adequately mitigated by actions, including support provided by the French government, to restore the group's financial flexibility at a level commensurate with the current ratings; and (2) EDF appears likely to restore its nuclear output on a sustainable and predictable basis.

Factors that could lead to a downgrade

The ratings could be downgraded if (1) the combination of the group's action plan and government support are insufficient to offset the incremental risks associated with the rise in ARENH cap; or (2) nuclear output from EDF's existing nuclear fleet is in structural decline.

Key indicators

Exhibit 2

Electricite de France

	Dec-15	Dec-16	Dec-17	Dec-18	Dec-19	Dec-20	2021 (E)	2022 (E)
(CFO Pre-W/C + Interest) / Interest Expense	5.0x	5.3x	4.8x	5.4x	5.6x	7.0x	5.6x	1.5x
(CFO Pre-W/C) / Net Debt	18.5%	18.5%	17.7%	21.3%	19.4%	21.8%	20.0%	1.7%
RCF / Net Debt	15.6%	17.4%	16.8%	19.7%	18.6%	21.0%	19.1%	0.9%

All figures and ratios are calculated using Moody's estimates and standard adjustments. Moody's forecasts (f) or projections (proj.) are Moody's opinion and do not represent the views of the issuer. Periods are financial year end unless indicated. LTM = Last 12 months.
These ratios do not take into account the fair value of EDF's stake in RTE included in the company's dedicated assets.
Source: Moody's Investors Service

Profile

With net installed generation capacity of 128 gigawatts (GW) as of the end of June 2021, Electricite de France (EDF) is one of Europe's largest integrated utilities, providing electricity generation, distribution and supply services. The group is organised along the following business lines:

» Generation and supply in France, where it is the dominant power generator and supplier

» Regulated supply in France, which primarily includes electricity distribution through its subsidiary, Enedis

» UK, through EDF Energy Holdings Ltd (EDF Energy, Baa2 RuR), which is the country's largest generator operating the UK nuclear fleet

» Italy, where it is the third-largest generator through Edison S.p.A. (Edison, Baa2 RuR)

» Other international, which mainly consists of operations in Belgium, where EDF Luminus is the second-largest electricity group in the Belgian market, and in the Netherlands

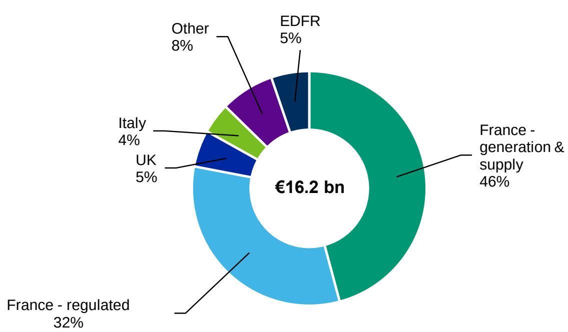
» EDF Renouvelables (EDFR), the group's wholly owned investment vehicle for renewables, excluding hydro

» Other activities, which include Framatome, EDF Trading Limited (Baa2 RuR) and energy services through Dalkia

Exhibit 3

France accounts for 78% of EDF's EBITDA

EBITDA split by business segment in 2020

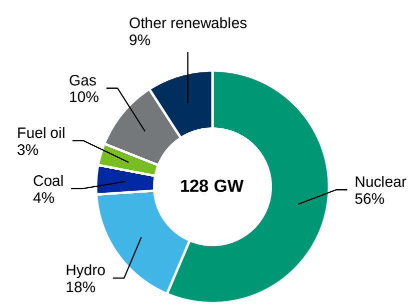


Sources: Company reports and Moody's Investors Service

Exhibit 4

EDF's installed capacity includes mostly nuclear and hydro

Net consolidated capacity split by fuel (as of the end of June 2021)



Sources: Company's reports and Moody's Investors Service

EDF is listed on the Euronext Paris, with a market capitalisation of around €27.1 billion as of 26 January 2022. It is 83.77% owned by the French government.

Detailed credit considerations

ARENH cap rise and lower expected nuclear output will strongly impact EDF performance in 2022

In January 2022, the French government announced an increase in the volume of electricity that EDF must sell under the ARENH mechanism by 20 TWh to 120 TWh over April to December 2022. This measure aims to limit the increase in regulated tariffs for 2022 to 4%. Whilst it will now have to sell more electricity to alternative suppliers, EDF estimates that its nuclear output for 2022 will be lower than previously anticipated, in the range 300-330 TWh to compare with 330-360 TWh initially expected. The reduction follows an extension of the outage period for five of EDF's French nuclear reactors related to weld and corrosion defects.

The planned ARENH changes and lower output will result in significant costs for EDF. In accordance with its hedging policy, the group had sold forward substantially all its anticipated 2022 output at a price Moody's estimates close to €55/MWh. It will now have to buy up to c. 50 TWh of electricity at prevailing market prices to meet its obligations and sell 20 TWh at €46.2/MWh and the rest of the power at hedged prices. The planned increase in the ARENH ceiling will also weigh on future regulated tariffs by reducing the contribution of merchant exposed volumes in the tariff calculation.

EDF has said that the consequences of the ARENH changes and the outages cannot be determined at this stage. For illustrative purposes, the group has estimated the impact on 2022 EBITDA at circa €7.7 billion based on market prices on 12 January 2022. The impact of the reduced output is, according to EDF, currently being analysed. We estimate that EDF's funds from operations (FFO)/net debt could fall significantly below 10% in 2022, absent mitigation measures, as compared with guidance for the current BCA of baa2 which is in the mid-to-high teens in percentage terms.

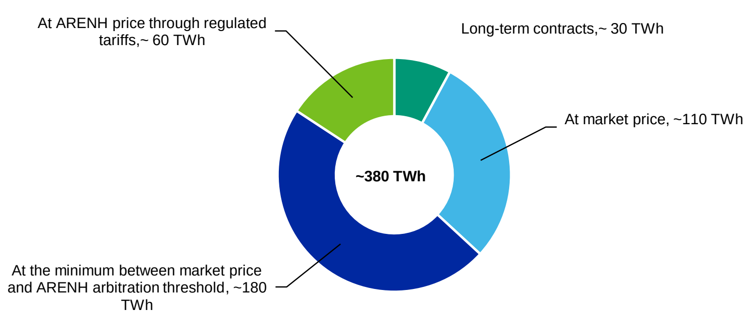
in September 2019, the Climate-Energy law raised the possible ARENH ceiling to 150 TWh, to compare with 100 TWh previously settled by the Nome law, at the French government's discretion. As a consequence, the government could further increase the ARENH cap in 2023, to reflect the rising market shares of alternative suppliers in France. Such a decision will be credit negative if the power prices remain high because EDF will have to sell a larger portion of its nuclear output at a low price.

Fixed-cost generation fleet exposed to volatile power prices

We estimate that commodity-exposed activities account for 35%-40% of EDF's EBITDA. Around 110 terawatt-hour (TWh) of EDF's domestic electricity production is directly exposed to market prices (see Exhibit 5) while power generation in the UK and Italy is to date fully exposed to wholesale prices. Although EDF typically hedges by selling forward a substantial proportion of its outright power generation two to three years ahead of delivery, the company retains exposure to market prices as hedges roll off. Capacity payments mitigate only a part of EDF's commodity price exposure.

Exhibit 5

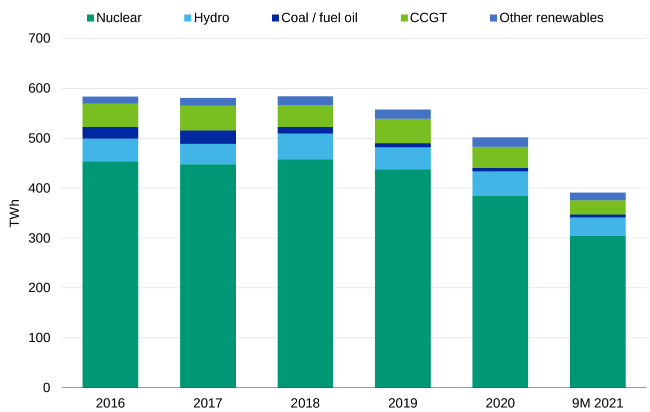
Distribution of electricity sales[1] in France according to their market exposure in 2020
In TWh



[1] Sales excluding purchase obligation volumes and volumes under long-term supply contracts.
[2] Regulated electricity sales tariffs.
Sources: Company reports and Moody's Investors Service

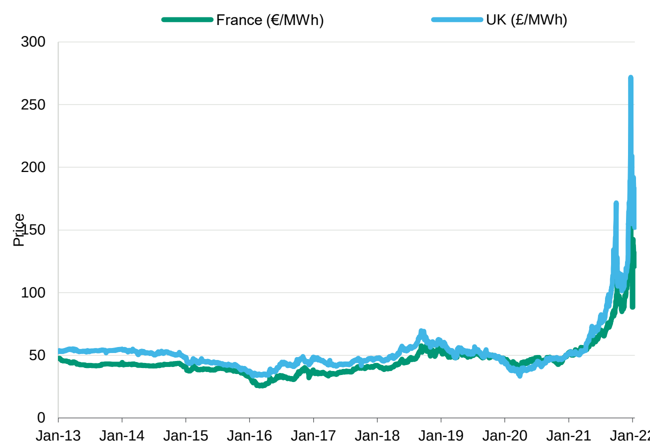
EDF is particularly exposed to movements in wholesale power prices because its generation fleet is predominantly fixed cost. In 2020, 86% of its 502 TWh output was represented by nuclear and hydro.

Exhibit 6
Most of EDF's generation output ...
Output by technology



Sources: Company reports and Moody's Investors Service

Exhibit 7
... is exposed to volatile power prices
One-year forward baseload power price



Sources: FactSet and Bloomberg

Like other large European markets, including the UK, forward baseload power prices in France rose sharply in 2021. The current one-year forward price is around €121/megawatt-hour (MWh), up 135% year on year, driven by the carbon dioxide (CO_2) price, which has increased by 140% to around €81/tonne.

Forward wholesale power prices stand at €84/MWh and €71/MWh in 2023 and 2024. We expect power prices to trade in a range of €70-90/MWh over 2023-24 (see: Europe's electricity markets: In France, the rise in power prices and decarbonisation targets will support new nuclear capacity, October 2020). Higher prices, if sustained, will benefit EDF's largely fixed cost generation but subject to historic hedges and the direct and indirect effects of the ARENH mechanism under which EDF is obliged to sell part of its output at €42/MWh for the first 100 TWh and €46.2/MWh for the subsequent 20 TWh in 2022.

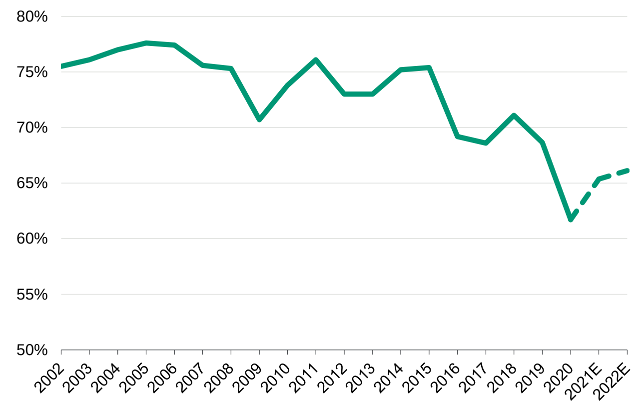
Nuclear production in 2021 totalled 360.7 TWh but 2022 will be affected by defected defects

In 2021, EDF produced 360.7 TWh of nuclear power in France, +7.5% compared to 2020 thanks to a higher availability of its nuclear fleet driven by less fleet modulation in a context of high power prices.

In mid January 2022, EDF cut its estimates for its French nuclear output in 2022 to 300-330 TWh, to compare with 330-360 TWh initially expected. This is because the group detected weld and corrosion defaults on four 1.45GW reactors and on one 1.3GW reactor. An ongoing audit of the other 19 1.3GW reactors is expected to conclude at the beginning of February 2022. Any further issues will materially affect EDF's performance in 2022 because the group will have to buy the shortfall in production on markets presumably at high prices.

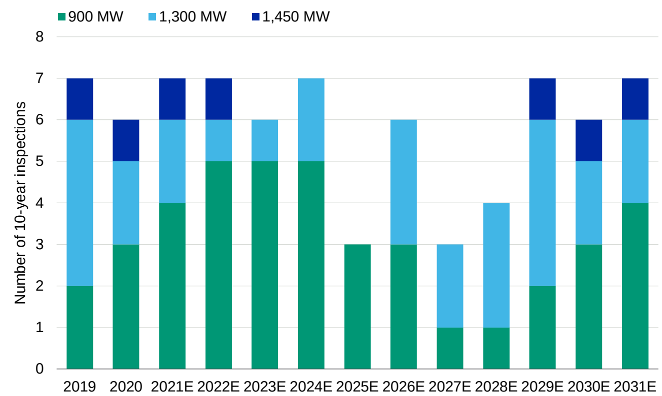
EDF produced 41.7 TWh of nuclear power in the United Kingdom in 2021 (-8.7% compared to 2020). Two nuclear units in the UK have recently been shut down, Dungeness B (1 040 MW) was shut down in June 2021 and Hunterston B (two gas-cooled reactors, 960 MW) in January 2022.

Exhibit 8
Outages for lifetime extensions and consequences of the pandemic will constrain the output
Load factor of the French nuclear fleet



The 2021-22 estimates represent Moody's forward view, not the view of the issuer.
Sources: Company reports and Moody's Investors Service

Exhibit 9
Current high levels of maintenance will weigh on the output
Number of 10-year inspections by reactor type as of the end of June 2021



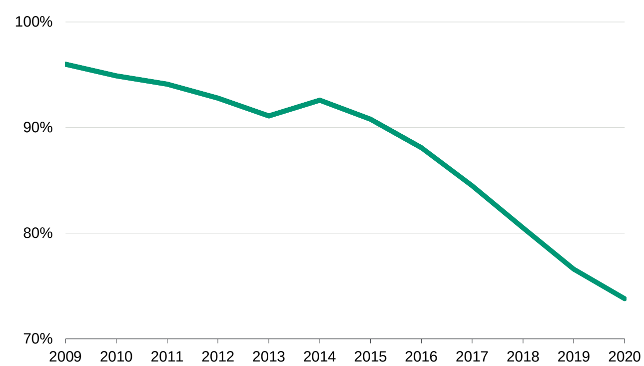
Source: Company reports

Status as the leading electric utility in France, challenged by growing competition in supply

EDF is the leading electricity generator in France, with 87 GW of installed capacity as of year-end 2020. The company's annual domestic generation (389 TWh in 2020, excluding French island activities, representing 78% of the national power output and mostly generated by nuclear and hydropower plants) is matched by its downstream position, which consists of more than 27 million electricity customer accounts, or about 59% of the electricity consumption in France as of year-end 2020.

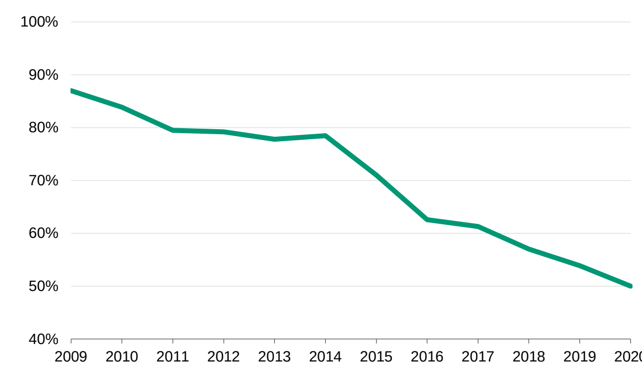
This market position, combined with the predominantly regulated nature of electricity tariffs until 2015, has historically underpinned the predictability of EDF's cash flow. However, growing competition in the supply market, illustrated by higher churn rates (see Exhibits 10 and 11) is a challenge.

Exhibit 10
EDF is gradually losing market share in both the residential ...
Incumbent share of the residential electricity supply market in France



Source: CRE

Exhibit 11
... and nonresidential power supply markets in France
Incumbent share of the nonresidential electricity supply market in France



Source: CRE

Over the next five years, and particularly if ARENH volumes were to be further increased from the current cap of 120 TWh, EDF will face accelerated erosion of its market share in the domestic residential segment. As mentioned, the Energy-Climate law, promulgated in November 2019, authorised the French government to increase the cap to 150 TWh from 2020.

The Energy-Climate law endorses the end of regulated gas tariffs in France, but, as of now, there is no timeline. This is despite the European Union pushing for the phaseout of regulated tariffs as part of its Energy Union initiative. Short-term pressure to eliminate regulated tariffs eased after a ruling in May 2018 by the country's highest administrative jurisdiction (*Conseil d'Etat)*. This ruling endorsed regulated tariffs as serving the public economic interest of price stability, subject to certain conditions — including that they be subject to regular reviews, and restricted to residential and small and medium-sized nonresidential sites.

Regulated activities and geographical diversification provide cash flow stability

EDF's credit profile is supported by its regulated activities in France, which accounted for 30% of group's EBITDA in the first half of 2021. These activities include, in addition to domestic electricity distribution through its subsidiary Enedis, regulated generation, and network and supply businesses in the French islands. These exclude EDF's 50.1% interest in France's transmission network owner and operator RTE, which is equity accounted.

Enedis' revenue benefits from a high degree of visibility under a regulatory framework that entered its sixth four-year regulatory period in August 2021 (TURPE 6). Under this framework, Enedis earns a return on regulated equity of 2.3% (nominal, pretax) and a 2.5% margin on its €53.7 billion regulated asset base. Although the return on capital depends little on interest rate trends and is stable at 2.5% since TURPE 4, the return on regulated equity decreases to 2.3% from 4% under the TURPE 6 regulatory framework to take into account the reduction in the risk-free rate and the corporate tax rate in France.

Exhibit 12

Regulatory framework Turpe 6

A remuneration mechanism based on a guaranteed return

Parameter	Turpe 6 (August 2021-July 2025)
Method	Margin on RAB, return on regulatory equity and allowance for cost of debt, revenue cap with incentives
Length of the regulatory period	4 Years
RAB calculation	Net accounting value of in-use assets
Allowed returns	2.5% margin on RAB, 2.3% return on regulatory equity
Incentive regulation	Targets raised, notably quality of service
Annual tariff indexation	Annual tariff indexation includes 0.31% remuneration above inflation.

Red = credit-negative change; green = credit-positive change; blank = credit neutral.
Sources: EDF and CRE

EDF's activities outside France account for roughly a quarter of EBITDA. Around 50% of that is generated by its nuclear plants in the UK and the growing renewables business of EDFR (11.7 GW of net installed capacity as of the end of June 2021 [excluding hydro], with a further 4.8 GW net capacity under construction), which should provide some support to the group's earnings outside France. Around 87% of EDFR's revenue comes from long-term contracts, with an average remaining life of 13 years.

Significant capital spending programme brings execution risk and negative FCF

EDF faces a substantial capital investment programme over the coming years, with significant and largely non-discretionary spending required to maintain and upgrade its distribution network and nuclear fleet in France. The latter is estimated at €49.4 billion over 2014-25 and reflects the age of the fleet, which is more than 30 years on average, as well as EDF's strategy to extend its life span to 50 years (or more); the group's ongoing programme to reduce unplanned outages and boost availability; and more stringent nuclear safety requirements after the Fukushima incident.

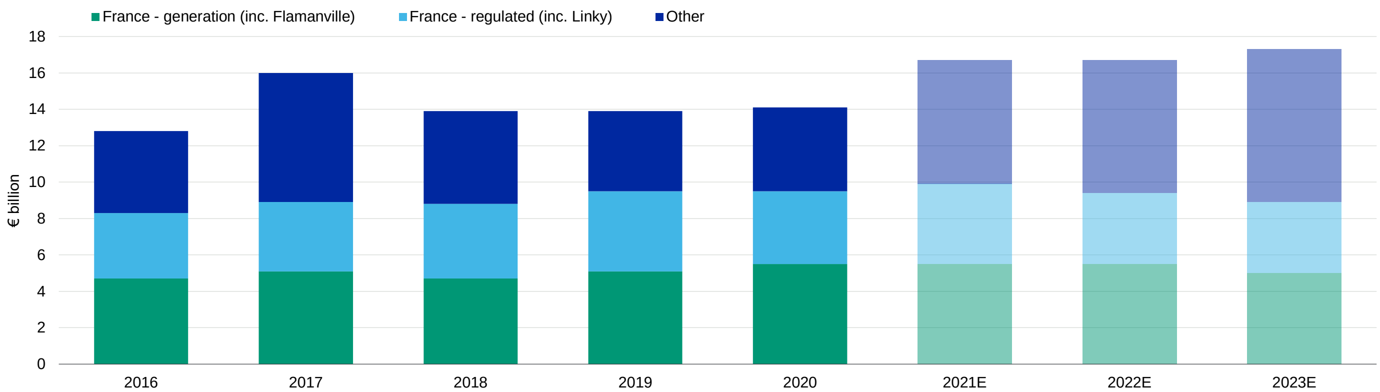
Other significant projects (excluding new nuclear reactor constructions, discussed below) include the €4 billion Linky smart meter project, which is due to be completed by 2022; and the accelerated expansion of renewable capacity through EDFR unveiled in

February 2021, including the upgraded objective of doubling the renewable installed capacity to 60 GW by 2030 from around 34.1 GW in 2020 (including hydro), compared with the 50 GW initially stated.

EDF could reduce its capital spending from its current target of €17 billion per year through 2023 given the deterioration in its financial flexibility as a result of the higher ARENH volumes and lower than expected nuclear production. Such a decision could primarily hit the development of renewable capacities, EDF being committed to develop new nuclear and networks.

Since the last quarter of 2019, and at the request of the French government, EDF has been assessing the feasibility of constructing six new EPRs in the country by 2040. Mechanisms for sharing the associated risks are being considered because of EDF's already constrained financial flexibility. The government will not make any investment decision before the Flamanville nuclear power plant's commissioning, whose fuel loading was recently delayed by six months and expected to occur in Q2 2023. Should this new nuclear development proceed, the consequences for EDF's credit profile will depend on the arrangements, including the support of the French government with regard to, inter alia, exposure to construction risk, tariff regime, financing structure and financial cost.

Exhibit 13
EDF's capital spending is likely to remain high
Net investments, excluding the asset disposal programme



The 2021-23 estimates represent Moody's forward view, not the view of the issuer.
Sources: Company reports and Moody's Investors Service

Ongoing new nuclear projects increase construction risk and cost

In France, EDF began construction of the 1.6 GW Flamanville 3 nuclear plant in 2007, with commercial operations scheduled for 2012 and an estimated total cost of €3.3 billion. However, there have been a series of cost overruns and delays in the life of this first EPR project in France.

In July 2019, commissioning of the nuclear reactor was delayed once again, by three years, after the discovery of issues with eight welds in the vessel. Before the pandemic, the power plant was expected to come into service in 2023, with fuel loading planned for year-end 2022. Additional remedial costs will total €1.5 billion, increasing the final construction cost to €12.4 billion or 3x the initial budget.

Early January 2022, EDF rescheduled the commissioning date for the Flamanville 3 project from the end of 2022 to Q2 2023. The estimated cost at completion increased by €0.3bn, to €12.7 billion. The operations remaining to be carried out before commissioning Flamanville 3 have been slowed down by the pandemic.

EDF began construction of a new 3.2 GW nuclear power plant at Hinkley Point in the UK in early 2017. HPC will only be the fifth plant in the world that will use the EPR technology. The total construction cost of the HPC project, of which 66.5% will be funded by EDF and the remaining 33.5% by its partner China General Nuclear Power Corporation (CGN, A2 stable), was revised upward the second time in January 2021 to £22 billion-£23 billion (in 2015 prices) from a previous estimate of £21.5 billion-£22.5 billion established in September 2019 (see Electricite de France: New cost overrun and potential delay at Hinkley Point are credit negative, published on 26 September 2019); the initial construction cost estimate was £18.1 billion. Cost increases reflect difficult ground conditions, extra costs to implement the completed functional design and a slowdown in work driven by the pandemic and staff protection measures.

The increasing cost estimates illustrate the execution risks that EDF and CGN face in constructing the power station. In addition, EDF's balance sheet will have to bear the burden of financial implications of a very long construction phase, because the investment will not generate any cash flow until the power plant is operational.

EDF has succesfully completed a large disposal programme, supplemented with additional measures to further strengthen its balance sheet

Following the completion of its €10 billion asset disposal programme for 2015-20 two years ahead of schedule, EDF has continued to implement measures to limit the increase in its financial debt, in the context of the pandemic, with several hybrid debt issues and further asset disposals.

In 2021, EDF paid the largest part of its 2020 dividends in new shares with shareholders opting for scrip dividends. The French state has also committed to scrip for the dividend relating to 2021, which will be paid in 2022. We expect EDF's dividend policy based on scrip dividends to be maintained in 2023 onwards, as part of the mitigation measures that EDF could announce on 18 February 2022.

The group has also expanded its disposal programme, initially set at €2 billion-€3 billion of assets in 2019-20, to €3 billion over 2020-22. Edison, its Italian subsidiary, sold its UK, Italian, Croatian, Greek and Egyptian Exploration & Production (E&P) activities to Energean in December 2020 for an enterprise value of $284 million (see Edison S.p.A: Recent portfolio rotation announcements are credit positive, published on 15 January 2021). In March 2021, Edison completed the sale of its Norwegian E&P assets to Sval Energi for an overall value of $374 million. In April 2021, Edison also closed the sale of Infrastrutture Distribuzione Gas (IDG) to 2i Rete Gas for an enterprise value of €150 million. Finally, in December 2021, Edison signed the disposal of 49% of Edison Renewables with Credit Agricole Assurances, based on a total EV of €2 billion. In April 2021, EDF also announced that it has reached an agreement with EIG to sell its 1,332 MW combined cycle gas turbine (CCGT) power station and 49 MW battery at West Burton B in the UK. The transaction was closed in August 2021. EDF also signed the sale of a Dalkia subsidiary, Dalkia Wastenergy, for an enterprise value of around €150 million, whose closing was expected over the summer. Finally, EDF completed in August 2021 the sale of its 49.99% stake in Constellation Energy Nuclear Group (CENG) for a cash consideration of $885 million. CENG owns and operates five nuclear reactors in the states of New York and Maryland, with a total capacity of 4 GW.

In addition to scrip dividends and disposals, EDF issued €2.1 billion and €1.25 billion social perpetual hybrid notes, respectively, in September 2020 and May 2021 (see Moody's assigns Baa3 rating to EDF's social hybrid notes; negative outlook, published in May 2021).

But lower nuclear output and tariff freeze will affect earnings and financial flexibility in 2022 onwards

In 2020, EDF reported solid financial performance despite historically low nuclear output and the economic contraction, resulting in an EBITDA decrease by only 2.7% organically, mainly suported by price increases for regulated activities (TURPE 5 indexation), tariff increases both in France and in the UK, and better hydrological conditions.

Despite the slight EBITDA contraction, Moody's-adjusted FFO increased by €2 billion year over year. This is because its 2020 EBITDA included fewer non-cash items[2] than that in previous years, driving a higher conversion rate of EBITDA into FFO.

EDF's reported net debt increased by €1.2 billion to €42.3 billion with negative cash flow of €2.7 billion partly funded by €2.1 billion of new hybrid securities, treated as equity under the IFRS standard. On a Moody's-adjusted basis, net debt was €66.4 billion, up €3 billion from adjusted net debt as of year-end 2019.

As a consequence, Moody's-adjusted FFO/net debt increased to 21.8%.

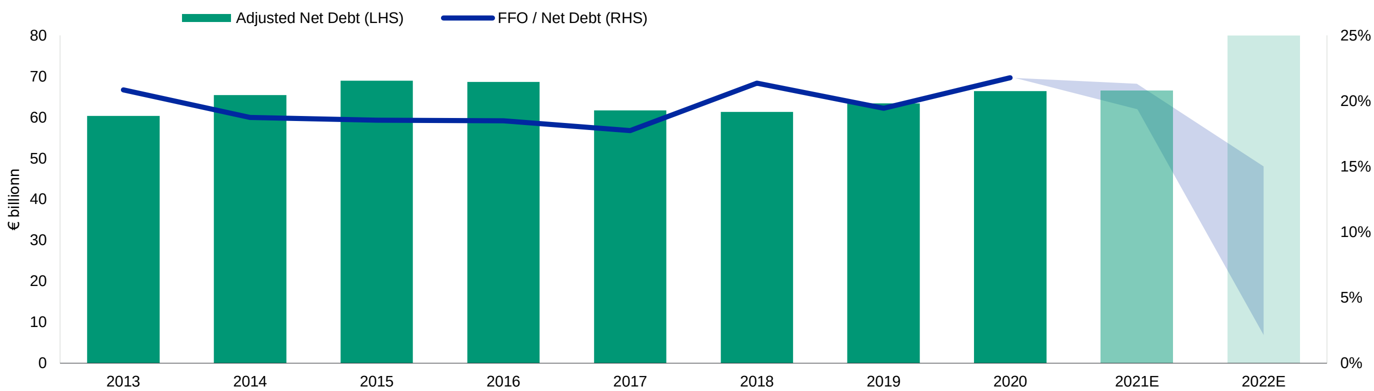
Over the first hafl of 2021, reported net debt fell by €1.3 billion, supported by a €1.25-billion hybrid bond issuance and reflecting neutral free cash flow, FFO covering broadly net investments, dividends and negative working capital. FFO/net debt ratio further improved over H1 2021, to 25.7%.

EDF reported sales of €57.1 billion over the first nine months of 2021, up from €48.8 billion over the same period in 2020. This increase was due to higher than expected nuclear output in France (+27 TWh) and positive price effects mainly in France (TURPE indexation and capacity). The performance also resulted from excellent results in gas and trading activities. However, on 15 December 2021, EDF revised downwards its 2021 EBITDA estimate to a range from €17.5-18 billion, compared to above €17.7 billon formerly, to capture the extension of planned outages on the four 1.45GW reactors.

As noted, the measures to limit the increase in electricity tariffs for 2022 and the anticipated reduction in EDF's nuclear output will materially the group's financial flexibility. The group will "consider appropriate measures to strengthen its balance sheet structure and any measure to protect its interests". The action plan will be unveiled on 18 February 2022. Meanwhile, EDF withdrew its 2022 Net Financial Debt/EBITDA guidance of around 3x.

Exhibit 14

EDF's credit metrics are likely to significantly weaken in 2022 as a result of the ARENH cap increase and the reduction of nuclear output



The 2021 and 2022 estimates represent Moody's forward view, not the view of the issuer.
Sources: Moody's Financial Metrics™ and Moody's Investors Service

Need for further support recognised in French multiyear energy plan

Because of the political endorsement of EDF's capital spending programme (notably with respect to HPC, Linky and the development of renewables) and its scale compared with its cash flow generation capacity, we expect the French government to continue to provide financial relief, if needed.

The need to address the strain on EDF's cash flow is acknowledged in the French government's *Programmation pluriannuelle de l'energie* (PPE), published in February 2019, and also in continuing discussions around potential remedial measures as part of the country's energy transition plan, including changes to the asymmetric ARENH mechanism and reorganisation of the group.

The PPE outlines the government's aim to continue France's planned transformation to a carbon-neutral economy. The plan targets reduced energy consumption and increased resilience, with growing renewables capacity reducing reliance on nuclear plants over the period to 2035, when 14 reactors are scheduled to close. We view the measured pace and flexibility incorporated into the plan as positive for EDF, allowing leeway for it to adapt its strategy accordingly.

Revision of nuclear regulations — including the ARENH mechanism, whose formal expiry date is 2025 — will be integral to transforming the electricity sector in a cost-efficient manner while giving EDF financial capacity for necessary investments. The government has also indicated that it is considering the organisational and financial structure that would allow EDF to operate in the best way to deliver the PPE[3].

In the context of it remaining an integrated group, the government had asked EDF to present a proposal to revise the group's configuration and shareholdings to comply with the European Commission guidelines and address the structural pressures exerted on its cash flow by its capital spending programme. According to the French press, EDF's possible reconfiguration could result in a split into three entities: EDF Blue, EDF Azur and EDF Green, with the first two entities potentially 100% directly or indirectly owned by the French government and the third not less than 70% owned. Reports suggest that EDF Blue could house the French and British nuclear and thermal assets, Framatome and RTE, EDF Azur could potentially house hydroelectric activities and EDF Green could house renewables (excluding hydroelectric activities), customers and services activities, Enedis and international activities.

However, EDF's reorganisation requires that the French state and European Commission agree on a new regulatory framework. In January 2020, the French government initiated a consultation about the new nuclear regulation, which may increase EDF's earnings visibility (see Electricite de France: Proposed new regulatory framework for nuclear power may increase earnings visibility, published on 30 January 2020). Following extensive discussions with the European Commission since this consultation, the French Government indicated in July 2021 that discussions with the European Commission had not yet led to an agreement and would continue over the subsequent months. We do not expect any material progress on the reform before the French elections in April 2022.

Expectation of support from the French government

Given the 83.77% stake held by the French government, EDF is considered a government-related issuer (GRI) under our methodology. Accordingly, and based on our expectation of support in case of financial distress, the A3 rating factors in two notches of uplift from the group's Baseline Credit Assessment of baa2.

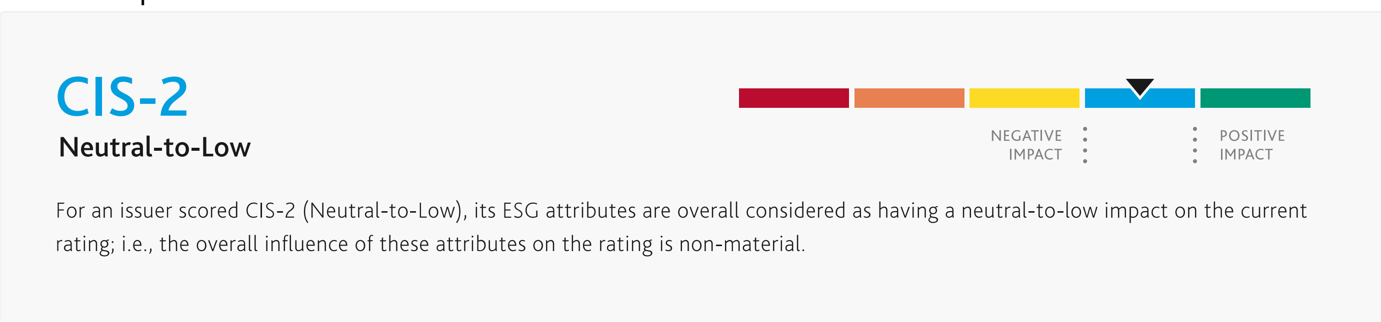
Our government support expectation reflects the strategic importance of EDF to the French government as the owner and operator of France's nuclear power plants; the company's highly unionised and politically influential workforce as illustrated over the recent demonstrations against the restructuring plan; and the French government's track record of supporting strategically important entities, reflected by the government subscribing to €3 billion of EDF's capital increase in March 2017 and exercising its option to take EDF's dividend in shares, including in 2021. Following the announcement of the ARENH ceiling's increase, the French government confirmed EDF's importance and its willingness to support the group if necessary.

ESG considerations

ELECTRICITE DE FRANCE's ESG Credit Impact Score is Neutral-to-Low CIS-2

Exhibit 15

ESG Credit Impact Score

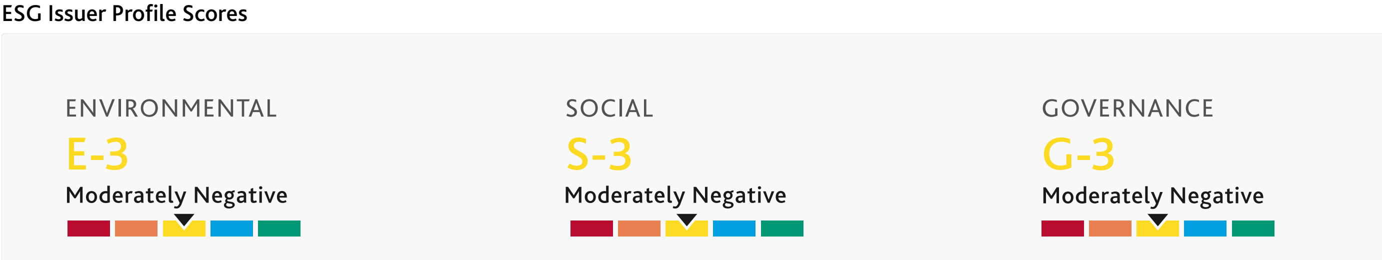


Source: Moody's Investors Service

EDF's ESG Credit Impact Score is neutral to low (**CIS-2**), indicating that the overall influence of its ESG attributes on the rating is non-material. This reflects moderately negative environmental and social risks and low to neutral governance risks. The effect of these considerations on the rating is mitigated by the expectation that EDF will receive a structural relief to support any acceleration in the development of new capacities, including renewables.

Exhibit 16

ESG Issuer Profile Scores



Source: Moody's Investors Service

Environmental

EDF's exposure to environmental risks is moderately negative (**E-3** issuer profile score) driven by moderate exposure to physical climate risks associated with the group's French electricity distribution assets (which contributes to 32% of EBITDA in 2020) and to Waste and Pollution risks given the material costs associated with nuclear decommissioning and nuclear waste treatment, albeit largely covered by a sizeable dedicated asset portfolio. It also captures the exposure of the group's nuclear fleet (c. 60% of the total installed capacities in 2020) to moderate risks of water management, in the event of restricted access to water induced by regular heat waves over summers. The profile also incorporates a large investment programme to increase the share of power output from renewables (excluding hydro).

Social

Moderately negative social risks for EDF (**S-3** issuer profile score) reflects the fundamental utility risk that demographics and societal trends could include public concerns over affordability, public expectation that utilities act as public service, utility's reputational risk. These pressures could turn into adverse political intervention. This also includes nuclear exposures and associated risk to public health.

Governance

EDF's governance risks are moderately negative (**G-3** issuer profile). This assessment takes into account neutral to low scores on financial strategy and risk management, management credibility and track record, organizational structure, compliance and reporting, which counterbalance the moderate risk associated with board structure policies and procedures, resulting from having a majority owner (French State owns over 83% of the capital). EDF's board has implemented measures to bolster its balance sheet including the €4 billion capital increase in 2016 and scrip dividend over the last six years. At the same time, the company has also acted to support other parts of the nuclear industry to the detriment of its credit quality.

ESG Issuer Profile Scores and Credit Impact Scores for the rated entity/transaction are available on Moodys.com. In order to view the latest scores, please click here to go to the landing page for the entity/transaction on MDC and view the ESG Scores section.

Liquidity analysis

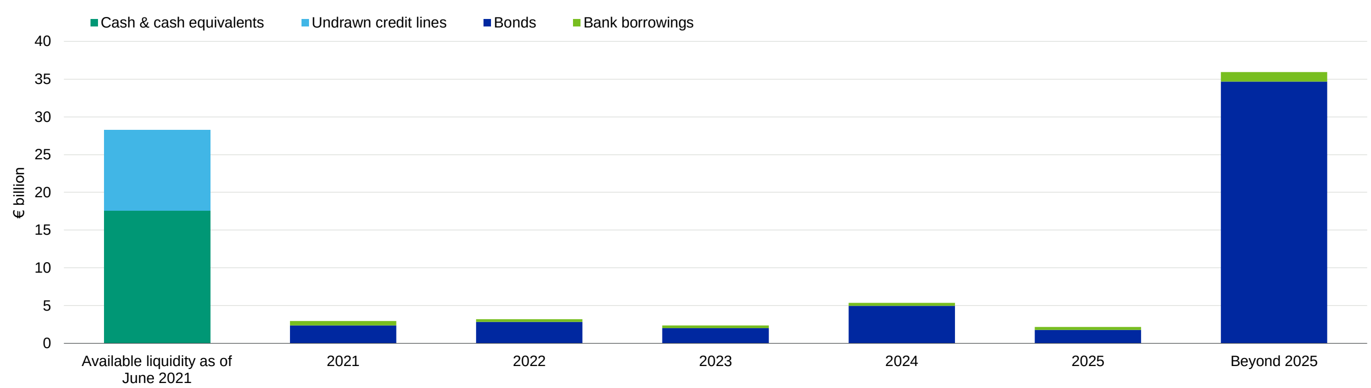
EDF's liquidity is underpinned by its significant cash flow, large holdings of cash and cash equivalents, and committed bank facilities. As of 30 June 2021, the group had €17.6 billion of cash and cash equivalents and liquid financial assets. In addition, unused committed credit facilities amounted to €10.7 billion, of which €2.9 billion mature within one year.

These sources of liquidity are sufficient for the group to meet its short-term debt maturities of €9.3 billion, as well as capital spending and any dividend payments over the next 18 months. Liquidity was also reinforced in May 2021 by a social hybrid issuance for €1.25 billion. In addition, EDF's debt maturities are well spread, avoiding any significant concentration of refinancing risk.

Exhibit 17

EDF has a well-spread debt maturity profile

Debt maturity profile and available liquidity as of 30 June 2021



Sources: EDF and Moody's Investors Service

Methodology and scorecard

EDF is rated in accordance with the rating methodologies for Unregulated Utilities and Unregulated Power Companies, published in May 2017, and Government-Related Issuers Methodology, published in February 2020.

Exhibit 18
Rating factors
Electricite de France

Unregulated Utilities and Unregulated Power Companies Industry Grid [1]	LTM ending 30, June 2021		Moody's 12-18 Month Forward View [2]	
Factor 1 : Scale (10%)	**Measure**	**Score**	**Measure**	**Score**
a) Scale (USD Billion)	Aaa	Aaa	Aaa	Aaa
Factor 2 : Business Profile (40%)				
a) Market Diversification	A	A	A	A
b) Hedging and Integration Impact on Cash Flow Predictability	A	A	A	A
c) Market Framework & Positioning	Baa	Baa	Baa	Baa
d) Capital Requirements and Operational Performance	Ba	Ba	Ba	Ba
e) Business Mix Impact on Cash Flow Predictability	Aa	Aa	Aa	Aa
Factor 3 : Financial Policy (10%)				
a) Financial Policy	Baa	Baa	Baa	Baa
Factor 4 : Leverage and Coverage (40%)				
a) (CFO Pre-W/C + Interest) / Interest (3 Year Avg)	6.5x	Baa	1.5x-5.5x	B - Baa
b) (CFO Pre-W/C) / Net Debt (3 Year Avg)	22.2%	Baa	2%-15%	Caa - Ba
c) RCF / Net Debt (3 Year Avg)	21.2%	Baa	2%-14%%	Caa - Ba
Rating:				
a) Scorecard indicated outcome		A3		Ba1 - Baa1
b) Actual Baseline Credit Assessment				baa2
Government-Related Issuer				**Factor**
a) Baseline Credit Assessment				baa2
b) Government Local Currency Rating				Aa2
c) Default Dependence				High
d) Support				High
e) Final Rating Outcome				A3

[1] All ratios are based on adjusted financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.
[2] As of January 2022.
[3] This represents Moody's forward view, not the view of the issuer, and unless noted in the text, does not incorporate significant acquisitions and divestitures.
Sources: Moody's Investors Service and Moody's Financial Metrics™

Ratings

Exhibit 19

Category	Moody's Rating
ELECTRICITE DE FRANCE	
Outlook	Rating(s) Under Review
Issuer Rating	A3[1]
Senior Unsecured	A3[1]
Jr Subordinate	Baa3[1]
Commercial Paper	P-2
EDF ENERGY HOLDINGS LTD	
Outlook	Rating(s) Under Review
Issuer Rating -Dom Curr	Baa2[1]
EDF TRADING LIMITED	
Outlook	Rating(s) Under Review
Issuer Rating	Baa2[1]
EDISON S.P.A.	
Outlook	Rating(s) Under Review
Issuer Rating	Baa2[1]

[1] Placed under review for possible downgrade on January 17 2022
Source: Moody's Investors Service

Appendix

Exhibit 20

Peer comparison

Electricite de France

	Electricite de France A3 Rating(s) Under Review			ENGIE SA Baa1 Stable			RWE AG Baa2 Stable			E.ON SE Baa2 Stable			ENEL S.p.A. Baa1 Stable		
(in EUR million)	FYE Dec-19	FYE Dec-20	LTM Jun-21	FYE Dec-19	FYE Dec-20	LTM Jun-21	FYE Dec-19	FYE Dec-20	LTM Sep-21	FYE Dec-19	FYE Dec-20	LTM Jun-21	FYE Dec-19	FYE Dec-20	LTM Sep-21
Total Assets	300,199	304,118	316,463	160,631	154,336	187,997	64,005	61,604	145,623	97,901	95,385	100,140	171,288	162,981	208,255
EBITDA	16,504	13,286	15,724	9,259	8,319	9,886	3,410	4,179	5,682	5,142	6,295	7,274	16,600	15,381	15,155
CFO Pre-W/C	12,314	14,461	16,831	8,285	6,512	7,125	1,428	3,815	6,989	3,423	4,502	5,527	10,966	11,875	10,707
Retained Cash Flow (RCF)	11,806	13,943	16,311	5,817	5,954	5,282	854	3,274	6,454	2,303	2,939	3,957	6,883	7,023	5,745
Net Debt	63,446	66,428	65,578	44,553	41,675	42,780	8,383	5,536	13,838	44,755	45,265	46,985	53,015	55,740	64,421
(CFO Pre-W/C) / Net Debt	19.4%	21.8%	25.7%	18.6%	15.6%	16.7%	17.0%	68.9%	50.5%	7.6%	9.9%	11.8%	20.7%	21.3%	16.7%
RCF / Net Debt	18.6%	21.0%	24.9%	13.1%	14.3%	12.3%	10.2%	59.1%	46.6%	5.1%	6.5%	8.4%	13.0%	12.6%	8.9%
(CFO Pre-W/C + Interest) / Interest Expense	5.6x	7.0x	8.6x	7.0x	5.8x	6.7x	3.2x	6.7x	13.1x	2.6x	3.6x	4.5x	5.3x	6.2x	4.5x
Debt / Book Capitalization	62.6%	62.7%	57.6%	58.1%	60.1%	57.1%	42.4%	42.0%	53.5%	76.1%	78.8%	72.9%	52.2%	55.2%	56.9%

All figures and ratios are calculated using Moody's estimates and standard adjustments. FYE = Financial year end. LTM = Last 12 months.
Source: Moody's Financial Metrics™

Exhibit 21

Adjusted debt breakdown

Electricite de France

(in EUR million)	FYE Dec-16	FYE Dec-17	FYE Dec-18	FYE Dec-19	FYE Dec-20	LTM Jun-21
As Reported Total Debt	65,195	56,846	59,188	67,380	65,591	61,503
Pensions	14,693	14,063	11,687	13,440	14,270	14,270
Leases	3,876	4,488	4,368	0	0	0
Hybrid Securities	5,048	5,048	5,051	4,605	5,645	6,263
Securitization	1,304	903	1,095	1,042	792	844
Non-Standard Adjustments	3,472	2,731	3,500	(400)	1,186	341
Moody's Adjusted Total Debt	93,588	84,079	84,889	86,067	87,484	83,221
Cash & Cash Equivalents	(24,916)	(22,357)	(23,593)	(22,621)	(21,056)	(17,643)
Moody's Adjusted Net Debt	68,672	61,722	61,296	63,446	66,428	65,578

Non-standard adjustments include, notably, nuclear provisions (net of dedicated assets), debt guarantees (€1.3 billion as of 31 December 2019), accrued interest (€1.3 billion as of 31 December 2019) and derivatives (€3.4 billion as of 31 December 2019), the last two being removed from debt as reported. All figures are calculated using Moody's estimates and standard adjustments.
Source: Moody's Financial Metrics™

Exhibit 22

Adjusted EBITDA breakdown

Electricite de France

(in EUR million)	FYE Dec-16	FYE Dec-17	FYE Dec-18	FYE Dec-19	FYE Dec-20	LTM Jun-21
As Reported EBITDA	17,551	16,738	14,346	21,078	17,791	22,932
Unusual Items - Income Statement	(108)	(1,519)	186	(2,150)	(1,253)	(3,950)
Pensions	(408)	(403)	(476)	(321)	(232)	(274)
Leases	646	748	728	0	0	0
Securitization	51	36	41	34	17	17
Interest Expense - Discounting	(2,369)	(2,075)	(2,589)	(2,230)	(3,096)	(3,020)
Non-Standard Adjustments	243	151	242	93	59	19
Moody's Adjusted EBITDA	15,606	13,677	12,478	16,504	13,286	15,724

(1) Reported EBITDA includes other income and expenses.
All figures are calculated using Moody's estimates and standard adjustments.
Source: Moody's Financial Metrics™

Exhibit 23

Select historical Moody's-adjusted financial data

Electricite de France

(in EUR million)	FYE Dec-16	FYE Dec-17	FYE Dec-18	FYE Dec-19	FYE Dec-20	LTM Jun-21
INCOME STATEMENT						
Revenue	71,203	64,892	68,546	71,347	69,031	73,942
EBITDA	15,606	13,677	12,478	16,504	13,286	15,724
EBIT	7,132	4,538	3,156	6,484	2,332	4,934
Interest Expense	2,975	2,917	2,948	2,655	2,392	2,204
BALANCE SHEET						
Net Debt	68,672	61,722	61,296	63,446	66,428	65,578
CASH FLOW						
Capital Expenditures	(14,344)	(14,856)	(16,217)	(16,189)	(15,473)	(16,075)
Cash Flow From Operations (CFO)	(16,504)	(11,822)	(17,230)	(14,964)	(12,354)	(13,888)
Dividends	745	575	986	508	518	520
Retained Cash Flow (RCF)	11,948	10,368	12,099	11,806	13,943	16,311
RCF / Net Debt	17.4%	16.8%	19.7%	18.6%	21.0%	24.9%
Free Cash Flow (FCF)	(3,441)	(3,040)	(3,775)	(2,891)	(3,110)	(2,240)
FCF / Net Debt	-5.0%	-4.9%	-6.2%	-4.6%	-4.7%	-3.4%
PROFITABILITY						
% Change in sales (YoY)	-5.1%	-8.9%	5.6%	4.1%	-3.2%	6.3%
EBIT margin %	10.0%	7.0%	4.6%	9.1%	3.4%	6.7%
EBITA margin %	11.4%	8.5%	6.2%	10.7%	5.5%	8.6%
EBITDA margin %	21.9%	21.1%	18.2%	23.1%	19.2%	21.3%
INTEREST COVERAGE						
EBIT / Interest Expense	2.4x	1.6x	1.1x	2.4x	1.0x	2.2x
EBITDA / Interest Expense	5.2x	4.7x	4.2x	6.2x	5.6x	7.1x
(EBITDA - CAPEX) / Interest Expense	0.4x	-0.4x	-1.3x	0.1x	-0.9x	-0.2x
LEVERAGE						
Debt / EBITDA	6.0x	6.1x	6.8x	5.2x	6.6x	5.3x
Net Debt / EBITDA	4.4x	4.5x	4.9x	3.8x	5.0x	4.2x

Source: Moody's Investors Service

Moody's related publications

Press Releases:

» Moody's reviews EDF's A3 ratings for downgrade, published on 17 January 2022

» Moody's changes outlook on EDF, EDFT, Edison and EDF Energy to stable; affirms ratings, published on 27 August 2021

» Moody's assigns Baa3 rating to EDF's social hybrid notes; negative outlook, published on 26 May 2021

» Moody's upgrades Edison to Baa2; negative outlook, published on 19 April 2021

» Moody's assigns Baa2 long-term issuer rating to EDF Energy Holdings Ltd, negative outlook, published on 9 March 2021

» Moody's assigns Baa3 rating to EDF's hybrid notes; negative outlook, published on September 2020

» Moody's changes outlook on EDF to negative, affirms ratings, published on 24 April 2020

Issuer Comments:

» Edison S.p.A.: Recent portfolio rotation announcements are credit positive, published on 15 January 2021

» Proposed new regulatory framework for nuclear power may increase earnings visibility, published on 30 January 2020

» Electricite de France: New cost overrun and potential delay at Hinkley Point are credit negative, published on 26 September 2019

» E&P sale accelerates strategic shift toward renewables, published on 5 July 2019

» Edison S.p.A.: Acquisition of EDF EN Italia renewable assets: a modest credit positive, published on 26 June 2019

Credit Opinions:

» Edison S.p.A.: Update to credit analysis, following rating affirmation, published on 21 September 2021

» EDF Energy Holdings Ltd: Update to credit analysis following rating affirmation, published on 21 September 2021

» EDF Trading Limited: Update following rating affirmation, published on 23 September 2021

Sector Comments:

» Regulated Electric & Gas Networks – Europe: 2022 outlook stable, with limited changes to key regulatory parameters, published on 10 January 2022

» Regulated Electric & Gas Networks - Great Britain: CMA draft ruling provides only modestconcessions to tough RIIO-2 determination, published on 31 August 2021

» Unregulated Utilities and Power Companies - UK: Re-approval of the UK capacity market is credit positive for generators, published on 24 October 2019

» Regulated Electric & Gas Networks – France: France's proposal to significantly cut allowed returns for gas transport and storage, published on 29 July 2019

Sector In-Depth:

» Europe’s electricity markets: In Europe, high energy prices will not derail theenergy transition, 30 November 2021

» Regulated Electric and Gas Utilities – Global: ESG considerations have an overall creditnegative impact on utilities with generation, 1 June 2021

» Energy Transition – Europe: Expansion of O&G in utilities' space credit positive for former, negative for latter, 12 November 2020

» Electric Utilities – Global: Cybersecurity readiness depends on scale, business model and generation ownership, 4 November 2020

» In France, concerns around nuclear availability highlight need to make renewables transition, published on 14 October 2020

» In Italy, progress toward decarbonisation is accelerating, 14 October 2020

» In Britain, net zero emissions target will create opportunities, require further and faster decarbonisation, 14 October 2020

Industry Outlook:

» 2022 outlook stable as intervention risk,high capex overshadow earnings growth, 9 December 2021

To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.

Endnotes

1 Le Gouvernement prend des mesures pour limiter la hausse des prix de l'électricité - EDF updates its nuclear output estimate in France for 2022

2 EBITDA non-cash items include fair value adjustments, gains or losses on asset disposal, and changes in provisions.

3 See Electricite de France: France's measured energy transition plan allows EDF time to adapt, but certain issues yet to be decided, published on 3 December 2018.

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the ratings tab on the issuer/entity page on www.moodys.com for the most updated credit rating action information and rating history.

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