MOODY'S
INVESTORS SERVICE

CREDIT OPINION
14 September 2021

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 to credit analysis

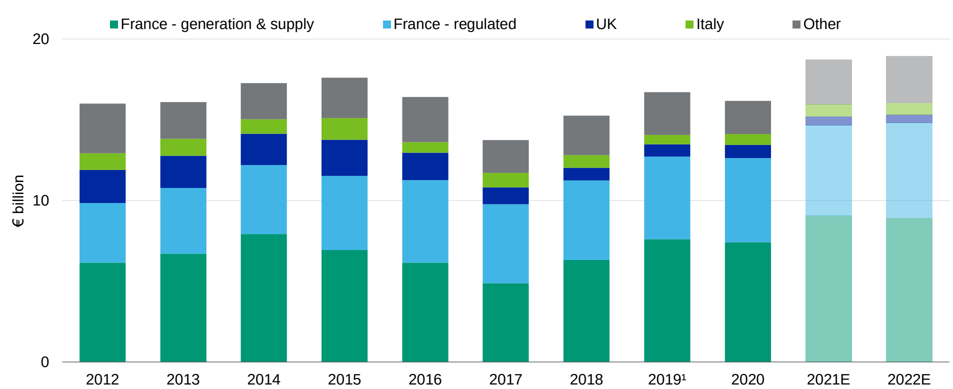
Summary

Electricite de France's (EDF, A3 stable) 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 40% of group EBITDA; 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, albeit supportive since H2 20; increasing competition in the French supply market weakening EDF's leading position; a significant capital spending programme which results in negative FCF; and the construction risk associated with the Flamanville new nuclear reactor in France and the Hinkley Point C (HPC) new nuclear project in the UK.

Exhibit 1

Higher power prices and nuclear output will support EBITDA over 2021-22



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 (Aa2 stable).

Credit strengths

- Leading electric utility in France
- Regulated activities and geographical diversification, which support cash flow stability
- Likely 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
- Limited visibility into a potential restructuring of EDF, given lack of progress in negotiations between the French government and the European Commission and potential for further delays given French elections in April 2022
- Increasing competition in the French supply market
- Construction risk associated with the Flamanville 3 and HPC nuclear power plant projects in France and the UK

Rating outlook

The stable outlook reflects Moody's expectation that EDF will comfortably maintain credit metrics commensurate with the baa2 BCA, its standalone credit quality before taking into account potential government support, with funds from operations (FFO)/net debt at least in the mid-to-high teens in percentage terms. The outlook also anticipates that EDF will receive financial relief to support any acceleration in the development of additional capacity, including the potential construction of six new European Pressurised Reactors (EPRs) in France.

Factors that could lead to an upgrade

Upward rating pressure is unlikely in the medium term, given the group's substantial capital spending commitments and uncertainties surrounding nuclear reform and the associated organisational and financial restructuring of EDF. Nevertheless, the ratings could be upgraded if (1) there is clarity on the evolution of nuclear regulation; and (2) EDF appears likely to achieve credit metrics in excess of the guidance for an A3 rating on a sustainable basis, as a result of higher power prices or the introduction of regulatory measures that would support the group's business model.

Factors that could lead to a downgrade

The ratings could be downgraded if (1) EDF's credit metrics appear likely to fall persistently below guidance; (2) a change in the group's relationship with the French government were to cause us to remove the uplift for government support; or (3) there were to be a significant downgrade of France's government rating.

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	5.5x-6x	5.5x-6x
(CFO Pre-W/C) / Net Debt	18.5%	18.5%	17.7%	21.3%	19.4%	21.8%	19%-21%	20%-22%
RCF / Net Debt	15.6%	17.4%	16.8%	19.7%	18.6%	21.0%	18.5%-20.5%	18%-20%

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 December 2020, 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 stable), which is the country's largest generator operating the UK nuclear fleet

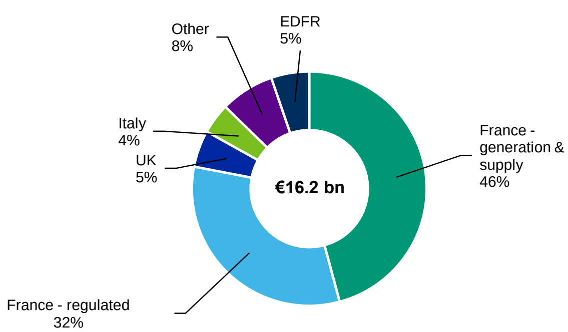
» Italy, where it is the third-largest generator through Edison S.p.A. (Edison, Baa2 stable)

» 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

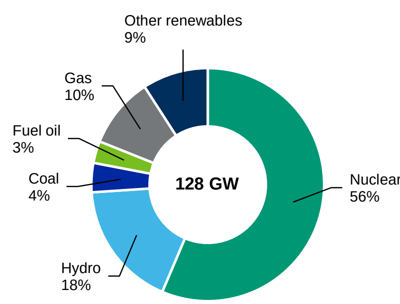
» Other activities, which include Framatome, EDF Trading Limited (Baa2 stable) and energy services through Dalkia

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

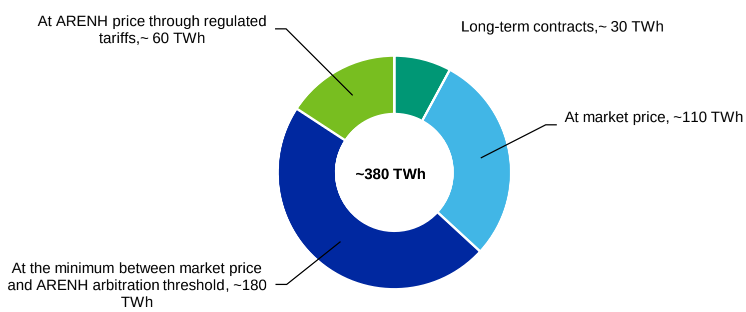
EDF is listed on the Euronext Paris, with a market capitalisation of around €34.4 billion as of 13 September 2021. It is 83.77% owned by the French government.

Detailed credit considerations

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.

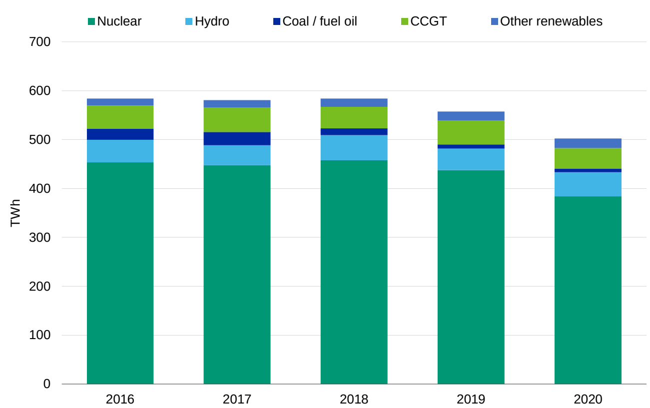
Exhibit 5
Distribution of electricity sales[1] in France according to their market exposure in 2020
In TWh



[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

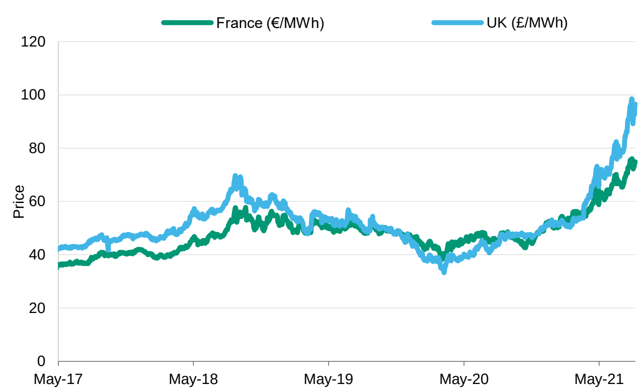
EDF is particularly exposed to movements in wholesale power prices because its generation fleet is predominantly fixed cost. In 2020, 86% of its 502 TWh output was represented by nuclear and hydro.

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

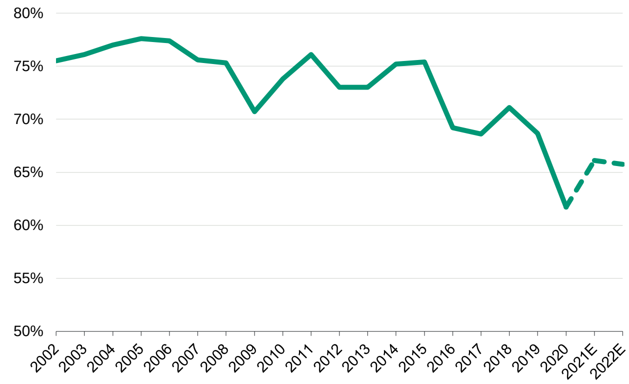
Like other large European markets, including the UK, forward baseload power prices in France have risen sharply in 2021. The current one-year forward price is around €75/megawatt-hour (MWh), up 46% year to date, driven by the carbon dioxide (CO_2) price, which has increased by 80% to around €58/tonne.

At these levels, the French wholesale price is above our estimated range of €45-€55/MWh over the period to 2023. Differences between our lower commodity price assumptions and the current market prices account for the gap (see: Europe's electricity markets: In France, concerns around nuclear availability highlight need to make renewables transition, 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 [*Accès régulé à l'électricité nucléaire historique*] mechanism under which EDF is obliged to sell part of its output at €42/MWh.

Nuclear production likely to reach record lows in 2020-22, which will significantly strain earnings

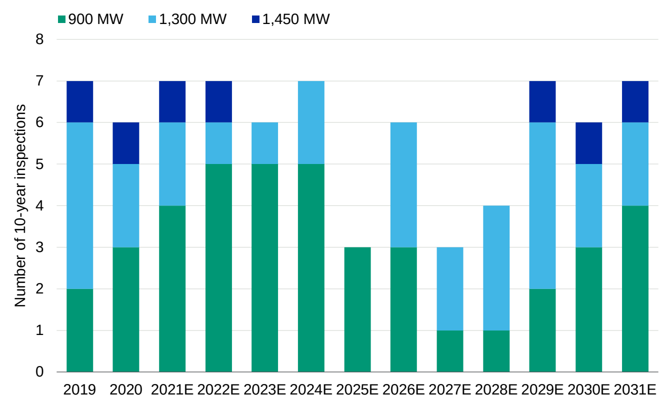
EDF's nuclear output in France reached a low in 2020 at 335 TWh, 44 TWh below 2019 production as pandemic-related confinement and staff protection measures disrupted planned maintenance and 10-year inspection outages. These two factors will also significantly reduce the nuclear output in 2021, assumed in a range of 345-365 TWh, as well as in 2022, assumed from 330-360 TWh. EDF produced 202.6 TWh of nuclear output over the first six months of 2021, reflecting a 4.4% increase in France but a 7.9% decline in the UK.

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



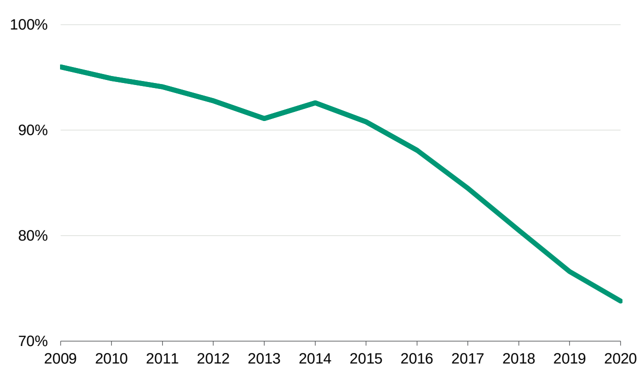
Source: Company reports

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.

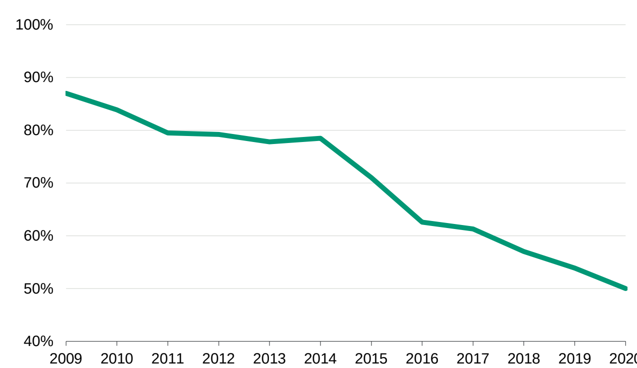
This market position, combined with the predominantly regulated nature of electricity tariffs until 2015, has historically underpinned the predictability of EDF's cash flow. However, growing competition in the supply market, illustrated by higher churn rates (see Exhibits 10 and 11) is a challenge.

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 increased from the current cap of 100 TWh, EDF will face accelerated erosion of its market share in the French residential segment. The Energy-Climate law, promulgated in November 2019, authorised the French government to increase the cap to 150 TWh from 2020, which it has not yet done. However, in July 2020, the French regulator Commission de la Régulation de l'Energie (CRE) advocated an increase in the ceiling to 150 TWh for 2021 deliveries to reflect the rising market shares of alternative suppliers in the French electricity market. If the ceiling is raised, EDF will have to sell more power at the ARENH price (which potentially will also be revised upward), to the detriment of its profitability.

The Energy-Climate law endorses the end of regulated gas tariffs in France, but, as of now, there is no timeline for the elimination of regulated electricity tariffs. 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

Only minor changes in the regulatory framework for the forthcoming regulatory period

A remuneration mechanism based on a guaranteed return

Parameter	Turpe 5 bis (August 2017-July 2021)	Turpe 6 (August 2021-July 2025)
Method	Margin on RAB, return on regulatory equity and allowance for cost of debt, revenue cap with incentives	No Change
Length of the regulatory period	4 Years	No Change
RAB calculation	Net accounting value of in-use assets	No Change
Allowed returns	2.5% margin on RAB, 4.0% return on regulatory equity	2.5% margin on RAB, 2.3% return on regulatory equity
Incentive regulation	Productivity gains, quality of service and continuity of supply, R&D and smart grids	Targets raised, notably quality of service
Annual tariff indexation	Annual tariff indexation calculated on expected inflation, with annual correction for actual inflation	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.

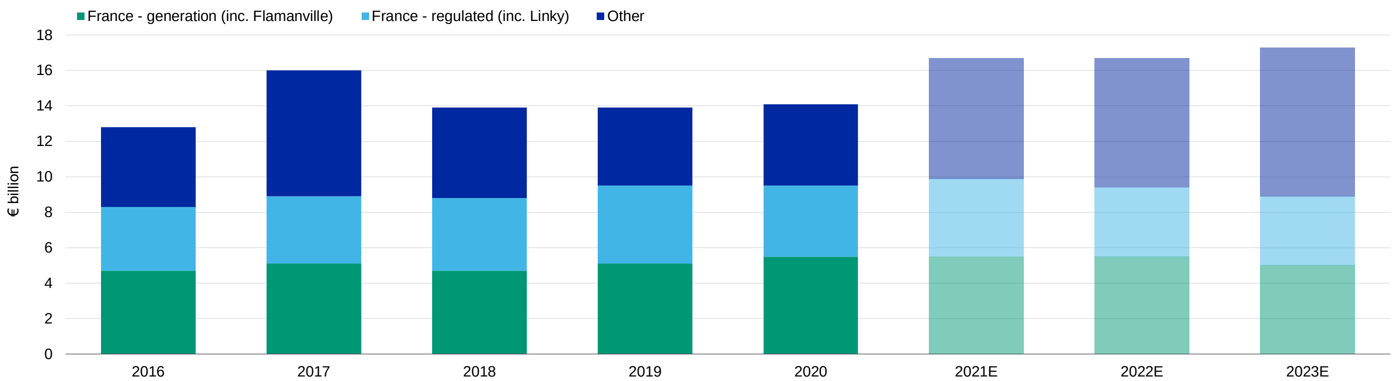
We expect capital spending to remain high with net investments close to €17 billion per year through 2023. Around 60% of those investments are related to growth spending in new capacity (especially nuclear in the UK and renewable assets) and the rest to maintenance investments.

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 2044. 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 is expected to occur by year-end 2022 or the beginning of 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. The commissioning might be further delayed because of the slowdown in work, driven by the lockdown in France, which removed any cost and schedule buffers. In addition, the French nuclear safety authority (ASN) is currently leading investigations that could force EDF to fix new technical issues from the second half of 2021, which could further delay the plant commissioning.

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.

Balance-sheet strengthening is positive for financial risk in the near term

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. However, the government has not prolonged EDF's scrip dividends policy beyond 2021 to date.

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. Finally, in April 2021, Edison closed the sale of Infrastrutture Distribuzione Gas (IDG) to 2i Rete Gas for an enterprise value of €150 million. 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. Overall, we expect disposals over 2021 to represent around €1.6 billion.

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).

Recovery in nuclear output and tariff increases will keep supporting earnings

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. The negative effects of the pandemic on nuclear generation, exacerbated by around 62% of costs being fixed, and supply activities operating under performance were almost fully mitigated 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[1] than that in previous years, driving a higher conversion rate of EBITDA into FFO.

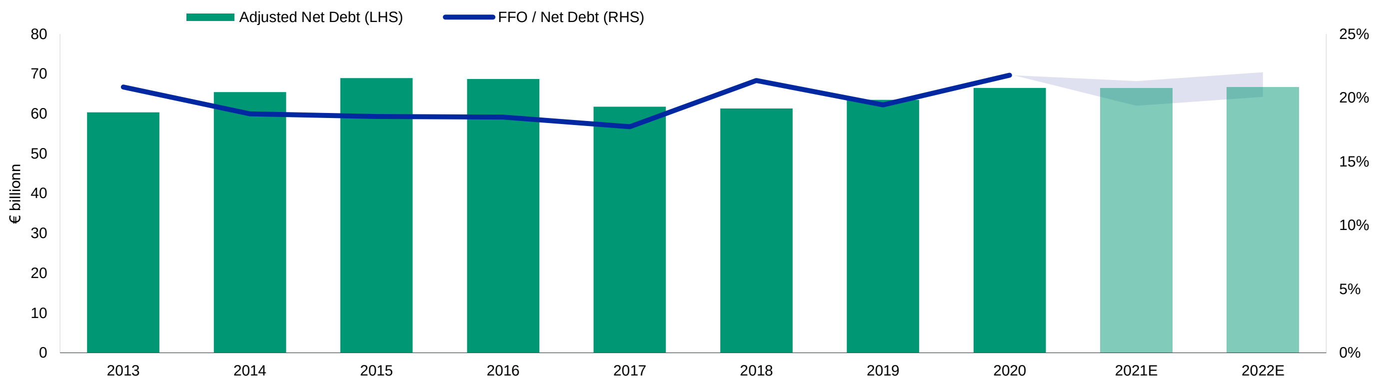
EDF's reported net debt increased by €1.2 billion to €42.3 billion with negative cash flow of €2.7 billion partly funded by €2.1 billion of new hybrid securities, treated as equity under the IFRS standard. On a Moody's-adjusted basis, net debt was €66.4 billion, up €3 billion from adjusted net debt as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

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

EDF also reported solid performance for the first half of 2021. EBITDA was up by 30% organically, mainly driven by higher nuclear output in France and a rise in distribution tariffs (TURPE). The performance also resulted from excellent results in gas and trading activities. Reported net debt fell by €1.3 billion, supported by a €1.3-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 the period, to 25.7%.

In July 2021, EDF increased its nuclear output target in France, to 345-365 TWh from the initially stated 330-360 TWh. As a result, EBITDA guidance was also revised to more than €17.7 billion from more than €17 billion previously. EDF targets net debt/EBITDA below 3x in 2021. We expect net debt to continue to rise in 2021, with capital spending likely exceeding cash flow generation and disposals.

Exhibit 14
EDF's credit metrics are likely to weaken as a result of a net debt increase in the next two years



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[2].

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 to update the existing ARENH mechanism. 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 has indicated late July 2021 that discussions with the European Commission have not led to an agreement yet and will continue over the subsequent months. Given the upcoming French elections in April 2022, we do not expect any material progress on the reform until this term.

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.

ESG considerations

EDF's exposure to environmental risks is predominantly related to France's energy transition plan endorsed by the Energy & Climate law promulgated at year-end 2019. The law confirms the objective to reduce CO_2 emissions by 30% by 2028 from the 2016 level, with a cap set at 227 million tonnes. With respect to this target, renewables development will accelerate; the group aims to achieve a 60 GW net installed capacity of renewable energy in 2030. In addition, the nuclear electricity output will be reduced to 50% of the total by 2035 (67% in 2020).

EDF is well positioned to face carbon transition risks compared with its peers because of the low-variable-cost nature and low carbon intensity (51 grams (g) CO_2/kilowatt hour [kWh]) of its nuclear and hydropower generation fleet, as well as the growing contribution of renewables and regulated activities to its earnings. This is offset by the company's significant exposure to large-scale, centralised generation.

Social considerations are not a significant driver of EDF's credit quality. The macroeconomic environment remains uncertain because of the pandemic. Maintenance work has been delayed because EDF has undertaken staff protection measures, which has reduced nuclear production further in 2020-22.

Liquidity analysis

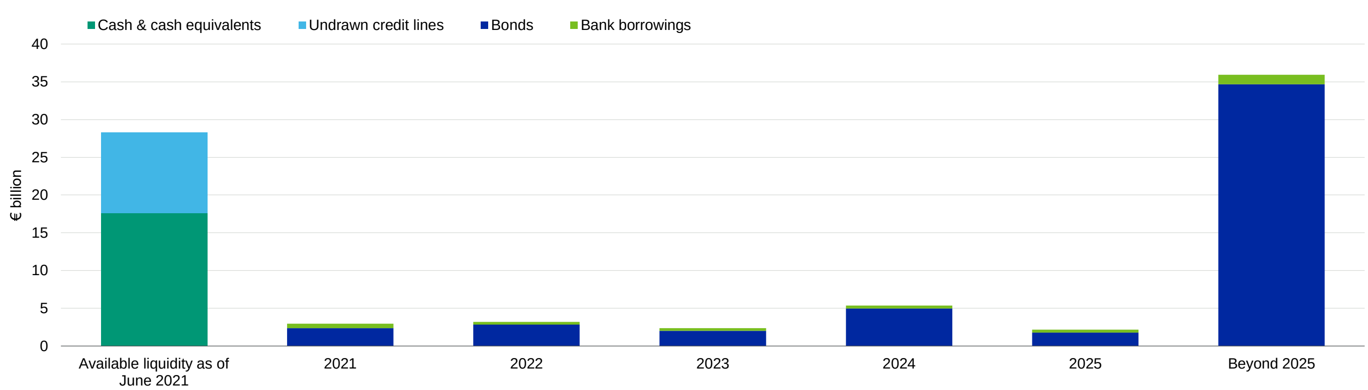
EDF's liquidity is underpinned by its significant cash flow, large holdings of cash and cash equivalents, and committed bank facilities. As of 30 June 2021, the group had €17.6 billion of cash and cash equivalents and liquid financial assets. In addition, unused committed credit facilities amounted to €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 15

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. The assigned Baa2 rating is two notches lower than the scorecard-indicated outcome of A3, which reflects that the group's financial profile is not aligned with current and anticipated investment plans - resulting in rising net debt looking forward; the high execution risk of the nuclear plants construction program and the significant exposure of earnings to power prices.

Exhibit 16

Rating factors

Electricite de France

Unregulated Utilities and Unregulated Power Companies Industry Grid [1]	FY ending 31, December 2020		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)	6.0x	Baa	5.5x-6x	Baa
b) (CFO Pre-W/C) / Net Debt (3 Year Avg)	20.9%	Baa	20%-21%	Baa
c) RCF / Net Debt (3 Year Avg)	19.8%	Baa	18%-19%%	Baa
Rating:				
a) Scorecard indicated outcome		A3		A3
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 August 2021.
[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™

Appendix

Exhibit 17

Peer comparison
Electricite de France

	Electricite de France A3 Stable			ENGIE SA Baa1 Stable			RWE AG (P)Baa2 Stable			E.ON SE Baa2 Stable			ENEL S.p.A. Baa1 Stable		
(in EUR million)	FYE Dec-18	FYE Dec-19	FYE Dec-20	FYE Dec-18	FYE Dec-19	FYE Dec-20	FYE Dec-18	FYE Dec-19	FYE Dec-20	FYE Dec-18	FYE Dec-19	FYE Dec-20	FYE Dec-18	FYE Dec-19	FYE Dec-20
Total Assets	286,158	300,199	304,118	158,295	160,631	154,336	80,513	64,005	61,604	55,090	97,901	95,385	168,958	171,426	163,453
EBITDA	12,478	16,504	13,286	9,024	9,259	8,319	2,203	3,410	4,179	3,675	5,142	6,295	16,176	16,600	15,392
CFO Pre-W/C	13,085	12,314	14,461	7,534	8,285	7,099	2,365	1,428	3,815	3,294	3,423	4,502	10,747	10,966	11,884
Retained Cash Flow (RCF)	12,099	11,806	13,943	4,936	5,817	6,541	1,348	854	3,274	2,411	2,303	2,939	7,175	6,883	7,028
Net Debt	61,296	63,446	66,428	42,041	44,553	41,675	19,612	8,383	5,536	18,641	44,755	45,265	51,711	53,058	55,901
(CFO Pre-W/C) / Net Debt	21.3%	19.4%	21.8%	17.9%	18.6%	17.0%	12.1%	17.0%	68.9%	17.7%	7.6%	9.9%	20.8%	20.7%	21.3%
RCF / Net Debt	19.7%	18.6%	21.0%	11.7%	13.1%	15.7%	6.9%	10.2%	59.1%	12.9%	5.1%	6.5%	13.9%	13.0%	12.6%
(CFO Pre-W/C + Interest) / Interest Expense	5.4x	5.6x	7.0x	6.0x	7.0x	6.2x	4.3x	3.2x	6.7x	2.9x	2.6x	3.6x	5.1x	5.3x	6.2x
Debt / Book Capitalization	63.8%	62.6%	62.7%	54.1%	58.1%	60.1%	62.6%	42.4%	42.0%	71.5%	76.1%	78.8%	51.3%	52.2%	55.2%

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 18
Adjusted debt breakdown
Electricite de France

(in EUR million)	FYE Dec-15	FYE Dec-16	FYE Dec-17	FYE Dec-18	FYE Dec-19	FYE Dec-20
As Reported Total Debt	64,183	65,195	56,846	59,188	67,380	65,591
Pensions	13,714	14,693	14,063	11,687	13,440	14,270
Leases	3,828	3,876	4,488	4,368	0	0
Hybrid Securities	5,048	5,048	5,048	5,051	4,605	5,645
Securitization	1,544	1,304	903	1,095	1,042	792
Non-Standard Public Adjustments	2,970	3,472	2,731	3,500	(400)	1,186
Moody's Adjusted Total Debt	91,287	93,588	84,079	84,889	86,067	87,484

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 19
Adjusted EBITDA breakdown
Electricite de France

(in EUR million)	FYE Dec-15	FYE Dec-16	FYE Dec-17	FYE Dec-18	FYE Dec-19	FYE Dec-20
As Reported EBITDA	18,485	17,551	16,738	14,346	21,078	17,791
Unusual Items - Income Statement	(138)	(108)	(1,519)	186	(2,150)	(1,253)
Pensions	(1,071)	(408)	(403)	(476)	(321)	(232)
Leases	638	646	748	728	0	0
Securitization	46	51	36	41	34	17
Non-Standard Public Adjustments	234	243	151	242	93	59
Interest Expense - Discounting	(1,742)	(2,369)	(2,075)	(2,589)	(2,230)	(3,096)
Moody's Adjusted EBITDA	16,453	15,606	13,677	12,478	16,504	13,286

(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 20

Select historical Moody's-adjusted financial data

Electricite de France

(in EUR million)	FYE Dec-15	FYE Dec-16	FYE Dec-17	FYE Dec-18	FYE Dec-19	FYE Dec-20
INCOME STATEMENT						
Revenue	75,006	71,203	64,892	68,546	71,347	69,031
EBITDA	16,453	15,606	13,677	12,478	16,504	13,286
EBIT	6,933	7,132	4,538	3,156	6,484	2,332
Interest Expense	3,174	2,975	2,917	2,948	2,655	2,392
BALANCE SHEET						
Net Debt	68,964	68,672	61,722	61,296	63,446	66,428
CASH FLOW						
Capital Expenditures	(14,524)	(14,344)	(14,856)	(16,217)	(16,189)	(15,473)
Cash from investing activities	(18,574)	(16,504)	(11,822)	(17,230)	(14,964)	(12,354)
Dividends	2,042	745	575	986	508	518
Retained Cash Flow (RCF)	10,735	11,948	10,368	12,099	11,806	13,943
RCF / Net Debt	15.6%	17.4%	16.8%	19.7%	18.6%	21.0%
Free Cash Flow (FCF)	(3,911)	(3,441)	(3,040)	(3,775)	(2,891)	(3,110)
FCF / Net Debt	-5.7%	-5.0%	-4.9%	-6.2%	-4.6%	-4.7%
PROFITABILITY						
% Change in sales (YoY)	2.2%	-5.1%	-8.9%	5.6%	4.1%	-3.2%
EBIT margin %	9.2%	10.0%	7.0%	4.6%	9.1%	3.4%
EBITA margin %	10.9%	11.4%	8.5%	6.2%	10.7%	5.5%
EBITDA margin %	21.9%	21.9%	21.1%	18.2%	23.1%	19.2%
INTEREST COVERAGE						
EBIT / Interest Expense	2.2x	2.4x	1.6x	1.1x	2.4x	1.0x
EBITDA / Interest Expense	5.2x	5.2x	4.7x	4.2x	6.2x	5.6x
(EBITDA - CAPEX) / Interest Expense	0.6x	0.4x	-0.4x	-1.3x	0.1x	-0.9x
LEVERAGE						
Debt / EBITDA	5.5x	6.0x	6.1x	6.8x	5.2x	6.6x
Net Debt / EBITDA	4.2x	4.4x	4.5x	4.9x	3.8x	5.0x

Source: Moody's Investors Service

Moody's related publications

Press Releases:

- 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, published on 10 May 2021
- EDF Energy Holdings Ltd: Discussion on credit analysis upon first time rating, published on 11 March 2021
- EDF Trading Limited: Update following outlook change to negative, published on 4 November 2020

Sector Comments:

- 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 from 2020 is credit negative, published on 29 July 2019
- Regulated electric & gas networks - Great Britain: Regulator signals smaller cut to allowed return, but many uncertainties remain, published on 30 May 2019

Sector In-Depth:

- 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
- Europe's electricity markets: In Europe, the energy transition is accelerating, 19 October 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:

» 2021 outlook stable as utilities remain resilient to the coronavirus pandemic, 17 November 2020

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.

Ratings

Exhibit 21

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

Source: Moody's Investors Service

Endnotes

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

2 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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