

Rating object	Rating information	
Électricité de France S.A. Creditreform ID: 2000000598 Incorporation: 1946 Based in: Paris, France Main (Industry): Generation, transmission, distribution, supply and trading of energies CEO: Jean-Bernard Lévy, CEO <u>Rating objects:</u> Long-term Corporate Issuer Rating: Électricité de France S.A. Long-term Local Currency (LT LC) Senior Unsecured Issues	Corporate Issuer Rating: A- / negative	Type: Update unsolicited
	LT LC Senior Unsecured Issues: A- / negative	Other: n.r.
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Content

Summary	1
Relevant rating factors	2
Business development and outlook ...	4
Business risk	7
Financial risk.....	9
Issue rating.....	10
Financial ratio analysis	12
Appendix.....	13

Analysts

Elena Damijan
Lead Analyst
E.Damijan@creditreform-rating.de

Rudger van Mook
Co-Analyst
R.vanMook@creditreform-rating.de

Neuss, Germany

Summary

Company

Électricité de France S.A. (EDF, Company, Group) is a leading electric utility company, based in France. The Group integrates the businesses of power generation, distribution, transmission, supply and trading, as well as energy services. With a global installed generation capacity of 122.3GWe as of 31 December 2019, generating 557.6TWh worldwide, the Group has one of the largest generation fleets in the world. The Company generates one of the worldwide lowest amounts of CO₂ per kilowatt-hour among the largest global power suppliers, thanks to its energy mix with a share of 90% decarbonized electricity generation. The generation fleet consists of an installed capacity of 60% nuclear, 18% hydropower, 10% gas, 6% renewables and 6% fuel and oil. The Group supplies energy and provides services to 38.9 million customer sites worldwide (of which 28.8 million in France), including: 33.6 million customers in electricity (of which 27.1 million in France) and 5.3 million customers in gas (of which 1.7 million in France). EDF is a globally leading grid operator managing 105,897 kilometers of high-voltage and very high-voltage networks, 50 cross-border power lines, and 1.3 million kilometers of low and medium voltage networks.

With 165,790 employees worldwide, EDF generated revenues of EUR 71.3 billion in 2019 (2018: EUR 68.5 billion) and an annual net profit of EUR 5.2 billion (2018: EUR 1.2 billion).

Rating result

The current rating attests a high level of credit worthiness to EDF, representing a low default risk. The Group has an integrated and diversified business model, as well as a good geographical diversification, and is of systemic importance for France as its main electric utility and operator of its transmission and distribution networks. EDF plays a key role in the energy transition in France. In 2019, the Group recorded solid revenues and strong margins, partially benefiting from the environment of favorable energy prices and low discount rates. EDF's business is marked by the immanent need for considerable investments due to high expenditure for the maintenance and upgrade of the nuclear fleet and power grid, as well as in the course of the Company's expansion into renewables. Construction delays and cost-overruns concerning the new nuclear projects Flamanville and Hinkley Point increase the already considerable investment burden. In recent years the Company was not able to cover its investment needs from operating cash flows, which put pressure on the Company's debt situation financial metrics. The Company has initiated a range of credit protection measures, including divestitures and the proposal of scrip dividends, which we assess as positive. Given the fact that the French state (CRA

rating for the French Republic: AA / stable, 5 June 2019) owns 83.58% of the Company's shares, and based on our rating methodology for government-related companies, we assume that the French government would be willing to support the Company in meeting any extraordinary financial shortfall.

Outlook

The one-year outlook of the rating is negative. The main reasons for this assessment are the effects of the coronavirus outbreak and the resulting overall economic slowdown. On 16 April 2020, the Company announced the necessity for adjustments in the scheduled nuclear maintenance outages plan in order to protect its personnel, resulting in a significant expected decrease in nuclear output. Additionally, the overall electricity consumption is expected to drop by up to 20%. This situation will, in our view, lead to a worsening of the Company's earnings and liquidity, which could negatively affect the Company's financials and its rating.

Reference:

The relevant rating factors (key drivers) mentioned in this section, are predominantly based on internal analyses and evaluations of the rating process and the derived valuations of the analysts participating in the rating and, if applicable, other rating committee members. The fundamental external sources used, are specified in the section "Regulatory requirements" and "Rules on the presentation of credit ratings and rating outlooks".

Excerpts from the financial key figures analysis 2019:

+improved revenues and EAT
+Net total debt / EBITDAadj.
+Ratio of interest expenses to total debt

-increase in Total assets
-equity ratio
-return on investments-

Relevant rating factors

Table 1: Financials | Source: Électricité de France S.A. Consolidated financial statements 2019, standardized by CRA

Électricité de France S.A. Selected key figures of the financial statement analysis Basis: Consolidated financial statements as of 31 December (IFRS)	CRA standardized figures ¹	
	2018	2019
Sales (EUR million)	68,546.00	71,317.00
EBITDA (EUR million)	14,563.00	17,206.00
EBIT (EUR million)	5,498.00	6,809.00
EAT (EUR million)	1,191.00	5,182.00
EAT after transfer (EUR million)	1,177.00	5,155.00
Total assets (EUR million)	278,949.50	298,613.50
Equity ratio (%)	18.07	17.89
Capital lock-up period (days)	71.47	65.85
Short-term capital lock-up (%)	48.70	51.35
Net total debt / EBITDA adj. (Factor)	14.05	12.68
Ratio of interest expenses to total debt (%)	2.88	2.10
Return on investment (%)	2.34	2.17

General rating factors

- + Predominant market position and systemic relevance in France
- + Integrated diversified business model
- + Largely CO₂-neutral assets
- + Geographical diversification
- + Stable and reliable cash flows from distribution and transmission businesses

¹ For analytical purposes, CRA adjusted the original values in the financial statements in the context of its financial ratio analysis. For example, when calculating the analytical equity ratio, deferred tax assets, goodwill (entirely or partly), and internally generated intangible assets are subtracted from the original equity, whilst deferred tax liabilities are added. Net total debt considers all balance sheet liabilities. Therefore, the key financial figures shown often deviate from the original values of the company.

- + Commitment to financial discipline
- + Support from the French state, both potentially and de facto (consent to scrip dividend)
- + Proved access to financial markets

- Partially aging assets
- Significant capex, high requirements due to the energy transition, ambitious plans regarding renewables
- Exposure to market price fluctuations
- Currently partially unfavorable regulation (ARENH)
- Execution risks regarding new EPR nuclear plants, cost overruns and construction delays
- Operating risks, especially associated with nuclear power
- Exposure to weather conditions
- Loss of market share in France in generation and sales activities
- Significant nuclear provisions and provisions for employee benefits and associated valuation risks

Current rating factors

- + Positive energy price effects against the backdrop of increased CO₂-prices
- + Improved earnings, also due to improved operational efficiency and savings
- + First EPR project in China has become operational
- + Positive effects in the valuation of dedicated assets
- + Sufficient liquidity

- Delays and cost overruns regarding Flamanville and Hinkley Point
- Increase in nuclear and pension provisions due to lower discount rates
- Cash outflows for investment activities higher than operative cash flow

Prospective rating factors

- + Deployment of further EPR projects
- + Changes in the current regulation with introduction of a price corridor to ARENH mechanism
- + Disposal of some assets and strengthening of liquidity
- + Strengthening of the market position in France as a key player for the period of energy transition and as a main supplier of reliable electricity

- Significant increase in nuclear provisions due to early decommissioning of nuclear plants (contingency risk)
- Assets impairments
- Further loss of market share to other market players in France
- Non-prolongation of concessions
- Effects of COVID-19 pandemic with announced decrease in electricity output, delays in plant outages and overall expected drop in electricity demand

Current rating factors are the key factors that have, in addition to the underlying rating factors, an impact on the current rating.

Prospective rating factors are factors and possible events that – according to the analysts as per the date of the rating – would most likely have a stabilizing or positive effect (+) and a weakening or negative effect (-) on future ratings, if they occurred. This is not a full list of possible future events with potential relevance for future ratings. Circumstances can arise that are not included in the list of prospective factors whose effects are impossible to assess at the time of the rating, either because these effects are uncertain or because the underlying events are deemed unlikely to occur.

ESG factors are factors related to the environment, social issues and, governance. For more information, please see the in "Regulatory requirements" CRA generally takes ESG relevant factors into account, when assessing the rating object and discloses them when they have a significant influence on the creditworthiness of the rating object, leading to a change in the rating result or the outlook.

Please note:

The scenarios are based on information available at the time of the rating. Within the forecast horizon, circumstances may occur that could lead to a change of the rating out of the indicated range.

ESG-factors

CRA generally considers ESG factors (environment, social and governance) within its rating decisions. In the case of Électricité de France S.A. we have not identified an ESG factor with significant influence.

A general valid description of Creditreform Rating AG, as well as a valid description of corporate ratings for understanding and assessing ESG factors in the context of the credit rating process, can be found here:

https://www.creditreform-rating.de/pub/media/global/page_document/The_Import_of_ESG_Factors_on_Credit_Ratings.pdf

Best-case scenario: A

In our best-case scenario, we assume a rating of A-. This could be the case if the Company is able to offset the negative effects of the lower nuclear output by implementing its plan of divestitures or through adjustments in capital expenditure.

Worst-case scenario: BBB+

In our worst-case scenario, we assume a rating of BBB+. In this case, the expected shortages in the nuclear output would be coupled with a negative price environment, significant investment outflows, and shortages in liquidity due to aggravated counterparty risks, which would lead to a worsening of the Company's financial metrics. The exact extent of the adverse effects of the COVID-19 crisis cannot be adequately estimated at this moment, as it will depend on the severity and duration of the crisis.

Business development and outlook

During the financial year 2019, EDF generated sales of EUR 71,317 million, up by 4.0% (2018: EUR 68,546 million). Organic growth, excluding the effects of exchange rates (EUR 151 million) and changes in the scope of consolidation (EUR 198 million), amounted to 3.5%. EBITDA and EBIT stood at EUR 17,206 million and EUR 6,809 million respectively (2018: EUR 14,563 million and EUR 5,498 million).

Growth in sales and EBITDA was adversely affected by a decrease in nuclear generation, especially in France and the United Kingdom (430.5 TWh cumulated, down by 5.0%). The reason for the decrease was lower nuclear plant availability resulting from the shutdowns, mainly because of the scheduled inspection of the plants. The hydropower conditions in France were also poor, causing a decrease in hydropower output in France by 15% to 39.7 TWh. On the other hand, the Company benefited from the better price conditions in France and UK and from the positive performance of EDF Renewables, particularly from the development and sale of structured assets. The increase in EBIT was achieved due to EBITDA growth and the positive impact of net changes in fair value on energy and commodity derivatives, which were partly offset by a rise in depreciation and amortization.

The net consolidated income amounted to EUR 5,182 million (2018: EUR 1,191 million). The increase was especially attributable to the improvement of net financial result from EUR -4,273 million to EUR 408 million in 2019, despite the increase in cost of gross financial indebtedness (EUR 1,806 million vs. EUR 1,712 million in 2018) driven by the first application of IFRS 16 (EUR 74 million). The main reason for this improvement was the positive change in fair value of the portfolio of dedicated assets (EUR 3.5 billion). The net income included non-recurring items, of

which EUR -986 million were impairments and other non-recurring items, EUR 490 million net changes in the fair value on energy and commodity derivatives, excluding trading activities, and EUR 1,780 million in net changes in the fair value of debt and equity instruments. The adjusted net income amounted to EUR 3,871 million, an increase of 57.9% compared to 2018 (EUR 2.452 million).

The Company managed to generate a reduction in operating expenses of EUR 1.2 billion since 2015, of which 80% in purchasing optimization and 20% in personnel cost.

With the exception of the United Kingdom and Other activities segments, all of the Group's divisions contributed positively to the development of sales and EBITDA.

Table 2: The development of individual corporate divisions in 2018 and 2019 before inter-segment eliminations | Source: Consolidated financial statements of EDF as of 31 December 2019.

EDF according to individual corporate divisions in 2018 and 2019						
In EUR million	Sales		EBITDA		Total assets	
	2018	2019	2018	2019	2018	2019
France - Generation and Supply	26,096	27,870	6,327	7,615	74,979	80,130
France - Regulated activities	16,048	16,087	4,916	5,101	64,608	68,195
Framatome	3,313	3,377	465	527	5,761	5,934
United Kingdom	8,970	9,574	783	772	27,728	32,394
Italy	8,077	7,567	424	578	8,919	9,142
Other International	2,411	2,690	240	339	6,839	6,862
EDF Renewables	1,505	1,565	856	1,193	11,193	11,694
Dalkia	4,189	4,281	292	349	4,769	4,818
Other activities	2,601	2,728	858	505	4,989	3,718

In France - Generation and Supply activities the negative effects of lower power generation (EUR -899 million), especially in nuclear were counterbalanced by the favorable energy price effects totaling EUR 2,230 million, associated with generally positive market price movements and with an increase in regulated sales tariffs since June 2019. The residential portfolio in the UK increased by 2%, which, together with the reinstatement of the capacity market in October 2019 and the increase in prices for nuclear energy, led to an increase in sales. The overall downturn in nuclear power generation following the outage extensions on two plants, as well as caps introduced on residential tariffs for electricity and gas, overcompensated the positive effects, causing the deterioration of EBITDA. The decline in sales in Italy was due to the lower gas volumes sold on the wholesale market and due to overall lower gas prices. EBITDA improved against the backdrop of the good performance of electricity ancillary services, hydropower generation, and new wind farms generation, as well as a result of the optimization of long-term contracts for gas supplies via pipeline. The Other International segment was dominated by the positive developments in Belgium and Brazil. The positive development of EDF Renewables was mainly due to the development and sale of structured assets, while generation was negatively affected by disposals. Dalkia signed or renewed a number of contracts in France, including long-term energy performance and public heat network contracts.

The Group's long-term strategy CAP 2030 aims to further develop its leading position as a low-carbon energy supplier in Europe against the backdrop of energy transition. It focuses on the proximity to customers and local communities through the deployment of smart metering at all sites by Enedis, and on energy services to private customers and companies in order to analyze and optimize their energy consumption. EDF intends to enhance the safety and competitive

strength of its low-carbon generation fleet by doubling the installed capacity of renewables to 50 GW by 2030, extending the life of its existing French nuclear fleet through the Grand Carénage² program, and building of EPR³ plants in France (currently Flamanville) and abroad. Finally, the Group is going to triple its business activities outside of France, becoming a key player in three to five countries and developing a significant presence in approx. 10 countries by focusing on low-carbon generation, energy services, as well as on engineering and trading.

The initially announced financial goals for 2020 were to achieve an EBITDA of EUR 17.5-18.0 billion and to keep net investments at approx. EUR 15.5 billion, while maintaining the solid level of reported net financial debt / EBITDA of 2.6. The Company planned disposals of EUR 2.0 to 3.0 billion and a dividend payment ratio of up to 50%.

On 14 April 2020, the Group withdrew all its financial targets for 2020 due to the COVID-19 outbreak. The Group expects an overall drop in electricity consumption of up to 20% from its usual level. In order to protect its personnel working on nuclear power plants, EDF has adjusted its maintenance outage plans, with some of the reactors expected to be taken off line in summer and autumn in order to save fuel and ensure a continuous supply in the winter 2020/2021. The Company expects a nuclear output of approximately 300 TWh in 2020 (379.5 TWh in 2019) and 330 to 360 each year in 2021 and 2021. Although the prices for 2020 are protected by hedging, we cannot rule out negative impacts from falling energy prices in the near future, and expect a decrease in earnings from regulated activities due to the drop in demand. Taking into consideration the Company's significant investment plans and limited flexibility in their adjustment, we expect a deterioration of EDF's financials in 2020 and probably in the following years, which could result in a deterioration of the Company's rating.

Structural risk

As of 31 December 2019, EDF's share capital amounts to €1,551,810,543 comprising 3,103,621,086 fully subscribed and paid-up shares, owned 83.58% by the French state, 14.92% by the public (institutional and private investors) and 1.34% by current and retired Group employees, with 0.16% held by EDF as treasury shares. The tradable shares are to be found on the Euronext Paris.

According to French legislation, EDF and its subsidiaries (Enedis and RTE), together with a few other companies, have been entrusted by the government with the missions to supply electricity and to develop and operate public transmission and distribution networks. Under Article L. 111-67 of the French Energy Code, the French state must hold more than 70% of the capital of EDF at all times.

The Group's activities are defined as follows:

- Energy generation and supply of energy to industry, local authorities, businesses and residential consumers, as well as commodity trading activities. The Group has one of the largest generation fleets in the world, with a global installed generation capacity of 122.3 GWe as of 31 December 2019, comprising 60% nuclear, 18% hydropower, 10% gas, 6% other renewables, and 6% oil and coal. EDF generated 557.6 TWh worldwide, of which 90% decarbonized electricity from nuclear (78.5%), hydropower (7.9%) and renewables (3.3%).

² A EUR 60 billion (in current prices) overhaul program aimed at refurbishing the French nuclear fleet of 58 reactors over the period of 2014-2025, enhancing reactor safety and, if conditions allow, continuing their operation.

³ Evolutionary Power Reactor, a third-generation pressurized-water nuclear reactor design.

- Operation, maintenance and development of the high-voltage and very-high-voltage electricity transmission networks. EDF indirectly holds (through CTE) 50.1% in the French transmission network operator RTE. RTE guides electricity flows by managing 105,897 km of high-voltage and very-high-voltage circuits for optimization of the power supply and carries electricity from generating plants to major industrial facilities and the distribution grids that supply consumers. RTE also acts as an interconnector with the power grids of neighboring countries through 50 cross-border power lines;
- Management of the low and medium-voltage public electricity distribution networks. EDF's 100% subsidiary Enedis manages the distribution grid that delivers electricity sold by all energy providers to 35 million residential, business, and local authority customers. Enedis is the concession holder of a grid owned by local authorities. As such, it operates and maintains 644,901 km of medium-voltage power lines and 721,000 km of low-voltage power lines;
- Services and production of equipment and fuel for nuclear reactors (Framatome);
- Other activities comprising energy services (district heating, thermal energy services, etc.) for industry and local authorities, and new businesses aimed mainly at boosting electricity generation through cogeneration and renewable energy sources.

The group comprises approx. 60 companies located in America, Europe and Asia. The Company prepares financial statements in accordance with IAS and IFRS.

Given the systemic importance of EDF, there are, in our opinion, no core risks associated either with the shareholder structure of the Company or with the organizational structure of the group. We assume support from the French government in the event of distress for the Company. Part of EDF's strategy consists in the non-organic growth of the Group through mergers and acquisitions, which could generate economies of scale and synergies, but which also entails structural risks.

Business risk

As an integrated energy company dominating all aspects of electricity business including generation, transmission, and distribution in France, EDF is systemically important for the French economy. The Company also holds strong positions in Europe, mainly in the United Kingdom, Italy and Belgium.

The business activities of EDF are subject to strong regulations in all relevant markets at both the national and the European level (EU). The Group must ensure that its structure, procedures, management and employees comply with the strict requirements set by supervisory authorities. Any changes to the Company's environmental, regulatory and policy framework, or price control and market mechanisms, could lead to additional costs, changes in the competitive environment or to limiting overall electricity production, adversely affecting the financial position of the Group.

In January 2020, the French government presented a draft Multi-year energy program (PPE), which is now part of the Energy Code and stipulates the state energy policy for the next years. It sets as its objective for 2035 to decrease the share of nuclear power in the French energy mix from currently 75% to 50%, with the closure of 14 reactors by 2035, of which 4-6 by 2030. It also provides for discontinuation of coal-fired power generation by 2022. These decisions should, according to French law, lead to EDF being compensated for the loss of profits. Two early reactor shutdowns are planned in 2027 and 2028, ahead of their fifth 10-year inspection. The change in their operating lifecycle would lead to prospective modification of the depreciation period and

a change in estimate for the nuclear provisions, with their possible increase by some tens of millions of euros.

Around 70% of EDF's electricity sales in France are subject to the ARENH (Acces regule a l'electricite nucleaire historique) mechanism, aimed at protecting customers and stimulating competition, which was introduced in 2011. This mechanism currently includes a reference highest price of EUR 42 per MWh, which has not been reviewed since 2012. There is no protection mechanism in the case of a potential market downturn. Currently, the ARENH mechanism is under review by the French authorities, and will have a regulated price corridor including both the cap and the floor prices, as well as new requirements according to volumes subject to regulation. Due to the current ARENH mechanism, EDF is limited in its possibility to benefit from overall increases in market prices and is not protected in the event of a market downturn.

The remaining 30% of EDF's electricity sales in France are entirely exposed to price fluctuations. EDF has hedging mechanisms in place to mitigate negative price developments.

Changes in other regulated sales tariffs, the Tariffs for Using the Public Transmission and Distribution Networks (TURPE), or changes to the regulation of greenhouse gas emissions and in terms of the price of CO₂ emission quotas, would be likely to affect the Group's profitability.

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

- Public electricity distribution concessions (Enedis) granted by local authorities;
- Hydropower concessions granted by the State;
- Public transmission network operated under concession from the French State (RTE);
- Concessions from public authorities for heat generation and distribution.

Even though EDF currently dominates the business areas subject to concessions, a residual risk of non-prolongation of concessions exists, especially taking into account the pressure from EU-legislation and requirements to open the market for other players and foster competition. The French government has not yet renewed 12 hydropower concessions that have expired. Since their expiry, these concessions have been in the "rolling extension".

The sector is capital intensive as the equipment requires constant investment and entails high fixed costs. The French nuclear fleet needs to be upgraded, which is linked to a substantial investment program (Grand Carénage). The new nuclear EPR technology has already started its commercial phase in China with the Taishan project. The domestic project Flamanville 3, the construction of which began in December 2007 and which was to initially take 54 months with commencement in 2012 and overall costs estimated at EUR 3.3 billion, is still not operative. The reasons for the delays have mostly been construction and safety anomalies, as well as breaks in the delivery of components. In June 2019, the French Nuclear Safety Authority (ASN) required EDF to repair eight welds in the containment building before commissioning the reactor. Currently, the commissioning is expected to take place in late 2022. The re-estimated construction costs amount to EUR 12.4 billion. For another major EDF's project, the Hinkley Point nuclear plant with two EPR reactors in the UK, cost overruns of GBP 1.9 – 2.9 billion to a total of GBP 21.5 – 22.5 billion were announced in 2019. These construction delays and cost overruns put pressure on the Group's investment plans, finance structure and liquidity, as well as on the profitability of the projects.

The coronavirus pandemic also entails a range of risks for the Company, including the necessity of investment program reviews due to the health impacts on the activity of the Group's employees, changes in the level of production, disruption of industrial supply chains, and an overall decrease in demand for electricity and in wholesale prices for commodities. All these factors

will, in our view, have a negative impact on the Group's financials and probably - depending on the duration of this crisis - on its rating.

Overall, we assess the Company as having a low to moderate business-risk profile, as the Company is a leading systemically important energy producer and operator of transmission and distribution networks in France, which is partially active in a regulated environment. Its business is well-diversified both with regard to its business operations and geographically. Nevertheless, it requires intensive capex to adapt to the energy transition, to maintain its nuclear fleet, and to carry the new nuclear projects forward, which entails high operating risks.

Financial risk

For analytical purposes, CRA adjusted the original values in the financial statements in the context of its financial ratio analysis. Contrary to our normal practice, we deducted the goodwill shown on the balance sheet from the equity only by 50%, suggesting a certain recoverability of the goodwill. The following descriptions and indicators are based on these adjustments.

The Company is highly capital intensive. Approximately 74% of the Company's balance sheet total is tied up in long-term assets, reflecting the specific conditions of the business and emphasizing the importance and high levels of investment required for the maintenance and development of the generation fleet as well as of transmission and distribution networks.

The capital structure of EDF could be improved, taking into consideration its relatively low adjusted equity ratio of 17.89% (2018: 18.07%) and its asset coverage ratio of 79.08% (2018: 78.77%). The deterioration of the equity ratio is partially a consequence of the first-time application of the IFRS 16, resulting in an increase in net indebtedness and in the recognition of EUR 4,492 million in right-of-use assets and related liabilities. The Company's liabilities structure is marked by a significant amount of long-term provisions related to nuclear business (EUR 55.6 billion), according to legal requirements in EDF's key markets. In France, to allow the financing of the Company's commitments regarding the decommissioning of nuclear plants and storage of radioactive waste, the law requires an allocation of certain assets (dedicated assets) to cover these potential costs. The carrying amount of dedicated assets was EUR 29.8 billion as of 31 December 2019. The estimated costs and the amount of nuclear provisions are sensitive to a range of assumptions such as depreciation periods, cash outflows, inflation and discount rates, and other factors. An increase in nuclear provisions, e.g. due to a decrease in the discount rate, may require additional allocations to the dedicated assets and may result in an adverse effect on the Group's financials. A decrease in the operating life of nuclear plants, resulting from the regulatory changes (new draft PPE), would lead to modification of the depreciation period, and a change in estimate for the nuclear provisions, particularly to an increase of decommissioning provision. The nuclear provisions made for the UK market are covered by the reimbursement receivables from the British Nuclear Liability Fund (NLF), totaling EUR 13.3 billion as of 31 December 2019. Other considerable items in the liabilities structure are the provisions for employee benefits (EUR 21.5 billion, 2018: EUR 18.6 billion), which are also sensitive to changes in the discount rates and entail other valuation risks due to a range of underlying assumptions, as well as special French public electricity distribution concession liabilities (EUR 47.5 billion, 2018: EUR 46.9 billion). The net value of assets operated under French public electricity distribution concessions amounted to EUR 58.4 billion as of 31 December 2019 (2018: EUR 56.5 billion). These specifics are one of the reasons for the relatively high level of net total debt / EBITDA of 12.68 as of 31 December 2019.

The Company's funding mainly consists of bonds amounting to EUR 52.4 billion as of 31 December 2019 (2018: EUR 50.4 billion) and loans from financial institutions (EUR 3.1 billion, 2018: EUR 3.1 billion). In November 2019, EDF raised USD 2 billion through the issuance of a US dollar-

denominated senior bond with a 50-year maturity and a fixed coupon of 4.50%. In December 2019, EDF raised EUR 1.25 billion through the issuance of a euro-denominated senior bond, with 30-year maturity and a fixed coupon of 2.00%. The average maturity of the Group's loans and other financial liabilities (EUR 67.4 billion) was 15.4 years at 31 December 2019 (EUR 63.7 billion, 13.6 years at 31 December 2018).

Another part of the EDF's capital structure is the issuance of perpetual subordinated bonds, which are accounted for in equity. In November 2019, the Company issued a EUR-denominated 500 million hybrid bond with a 3.0% coupon and an 8-year first-call date. As of 31 December 2019, perpetual subordinated bonds carried in equity amounted to EUR 9.2 billion.

On 31 December 2019, the Group's liquidity, consisting of liquid assets, cash and cash equivalents, totaled EUR 22.9 billion and available credit lines amounted to EUR 10.5 billion, of which EUR 5.0 billion represented credit lines indexed on ESG criteria. For 2020, the Group's scheduled debt repayments (principal and interest) are expected at EUR 13.4 billion. We do not expect liquidity shortages in the short-term perspective; however, the current coronavirus outbreak could lead to either payment delays or cancellation from counterparties due to the overall economic slowdown putting additional pressure on the EDF's liquidity.

The Company has significant annual spending for investments (EUR 15.7 billion net cash outflow in 2019, EUR 17.2 billion in 2018) due to the high maintenance and upgrade expenditure for nuclear and regulated assets, for the construction of nuclear plants, and for EDF's ambitious plans of expanding in renewables. The cost overruns for the construction of Hinkley Point C and Flamanville, as well as costs associated with delays in their commencement, put additional pressure on the Group's cash flows. In the last two years, net cash outflow for investments exceeded net cash flow from operating activities (EUR 14.0 billion in 2019 and EUR 13.3 billion in 2018), resulting in an increase of net financial indebtedness as of 31 December 2019 to EUR 41.1 billion (including EUR 4.5 billion lease liabilities) from EUR 33.4 billion. The Company has taken countersteps in the form of disposals (EUR 2-3 billion expected divestments in 2019-2020) and proposing scrip dividends. The French state has committed to scrip for the balance of 2019 and dividend relating to 2020, confirming our expectation of support by the state in the event of extraordinary necessity.

Taking into consideration the partially aged nuclear fleet in France and the increasing requirements regarding nuclear safety, as well as the current major projects (Hinkley Point and Flamanville), we do not assume that EDF will have flexibility in its investment plans. The situation is aggravated by the consequences of the COVID-19 pandemic with expected lower nuclear output due to adjustments of the maintenance outage plan and a drop in electricity consumption. We cannot rule out that these effects would cause a deterioration of EDF's financial metrics to the degree that it could have a negative impact on the rating outlook and / or on the rating.

Issue rating

Issue rating details

The rating objects of this issue rating are exclusively the long-term senior unsecured issues, denominated in euro, issued by Électricité de France S.A. and which are included in the list of ECB-eligible marketable assets. The ECB list of eligible marketable assets can be found on the website of the ECB. The notes have been issued under the EMTN program with its latest prospectus from 14 September 2018. This EMTN program amounts to EUR 45 billion. The notes under the EMTN program are senior unsecured, and rank at least *pari passu* among themselves

and with all other present and future unsecured and unsubordinated obligations of the issuer. Additionally, the notes benefit from a negative pledge provision.

We have provided the debt securities issued by Électricité de France S.A. with a rating of A- with negative outlook. The rating is based on the corporate rating of Électricité de France S.A. Other types of debt instruments or issues denominated in other currencies of the issuer have not been rated by CRA. For a list of all currently valid ratings and additional information, please consult the website of Creditreform Rating AG.

Result corporate issue rating

We derive the rating of the euro-denominated bonds of the issuers from the corporate issuer rating of Électricité de France S.A. The ratings of the issues are therefore set equal to the corporate rating of the issuer. The rating result is A- with negative outlook. For the issue ratings, we have applied our rating methodology for corporate issues.

Overview

Table 3: Overview of CRA Ratings | Source: CRA

Rating Category	Details	
	Date	Rating
Électricité de France S.A. (Issuer)	29.04.2020	A- / negative
Long-term Local Currency (LC) Senior Unsecured Issues	29.04.2020	A- / negative
Other	--	n.r.

Table 4: Overview of 2018 Euro Medium Note Program | Source: Base Prospectus dated 14 September 2018

Overview of 2018 EMTN Programm			
Volume	EUR 45,000,000,000	Maturity	Depending on respective bond
Issuer / Guarantor	Électricité de France S.A.	Coupon	Depending on respective bond
Arranger	BNP Paribas	Currency	Depending on respective bond
Credit enhancement	none	ISIN	Depending on respective bond

All future LT LC senior unsecured notes that will be issued by Électricité de France S.A. and that have similar conditions to the current EMTN program, denominated in euro and included in the list of ECB-eligible marketable assets will, until further notice, receive the same ratings as the current LT LC senior unsecured notes issued under the EMTN program. Notes issued under the program in any currency other than euro, or other types of debt instruments, have not yet been rated by CRA. For a list of all currently valid ratings and additional information, please consult the website of Creditreform Rating AG. For the time being, other emission classes or programs (such as the Commercial Paper Program) and issues that do not denominate in euro will not be assessed.

Financial ratio analysis

Table 5: Financial key ratios | Source: consolidated financial statements 2019, structured by CRA

Asset structure	2016	2017	2018	2019
Fixed asset intensity (%)	67.46	73.68	72.60	74.23
Asset turnover	0.26	0.24	0.25	0.25
Asset coverage ratio (%)	78.79	77.14	78.77	79.08
Liquid funds to total assets	1.04	1.39	8.54	7.65
Capital structure				
Equity ratio (%)	14.12	16.97	18.07	17.89
Short-term debt ratio (%)	22.91	17.62	18.93	18.43
Long-term debt ratio (%)	39.04	39.87	39.11	40.81
Capital lock-up period (in days)	66.80	78.71	71.47	65.85
Trade-accounts payable ratio (%)	4.70	5.26	4.81	4.31
Short-term capital lock-up (%)	63.52	42.19	48.70	51.35
Gearing	6.01	4.81	4.06	4.16
Leverage	7.06	6.45	5.70	5.56
Financial stability				
Cash flow margin (%)	14.88	20.38	15.66	35.08
Cash flow ROI (%)	3.82	4.97	3.85	8.38
Total debt / EBITDA adj.	14.88	15.19	15.69	13.98
Net total debt / EBITDA adj.	14.70	14.93	14.05	12.68
ROCE (%)	8.70	6.53	6.41	7.29
Total debt repayment period	13.01	10.16	101.08	9.84
Profitability				
Gross profit margin (%)	36.87	35.83	38.26	38.71
EBIT interest coverage	1.44	1.17	0.84	1.32
EBITDA interest coverage	2.96	2.94	2.21	3.34
Ratio of personnel costs to total costs (%)	17.62	19.19	19.90	19.34
Ratio of material costs to total costs (%)	63.13	64.17	61.74	61.29
Cost income ratio (%)	90.46	92.22	92.74	91.53
Ratio of interest expenses to total debt (%)	2.19	2.19	2.88	2.10
Return on investment (%)	2.56	2.09	2.34	2.17
Return on equity (%)	7.72	7.81	2.49	9.98
Net profit margin (%)	4.23	5.07	1.74	7.27
Operating margin (%)	10.51	8.72	8.02	9.55
Liquidity				
Cash ratio (%)	4.56	7.88	6.23	7.15
Quick ratio (%)	116.27	114.57	113.69	109.99
Current ratio (%)	142.05	149.37	144.73	139.79

Appendix

Rating history

The rating history is available under <https://www.creditreform-rating.de/de/ratings/published-ratings/>.

Table 6: Corporate Issuer Rating of Électricité de France S.A.

Event	Rating created	Publication date	Monitoring until	Result
Initial rating	09.12.2016	16.12.2017	23.04.2017	A- / stable
Update	24.12.2016	25.04.2017	28.04.2010	A- / stable
Update	29.04.2020	www.creditreform-rating.de	Withdrawal of the rating	A- / negative

Table 7: LT LC Senior Unsecured Issues Issued of Électricité de France S.A.

Event	Rating created	Publication date	Monitoring until	Result
Initial rating	04.10.2018	11.10.2018	28.04.2020	A- / stable
Update	29.04.2020	www.creditreform-rating.de	Withdrawal of the rating	A- / negative

Regulatory requirements

The present rating is an unsolicited rating in the regulatory sense. The analysis was carried out on a voluntary basis by Creditreform Rating AG, which was not commissioned by the Issuer or any other third party to prepare the present rating.

The rating is based on the analysis of published information and on internal evaluation methods for the assessment of companies and issues. The rating object was informed of the intention of creating or updating an unsolicited rating before the rating was determined.

The rating object participated in the creation of the rating as follows:

Unsolicited Corporate Issuer / Issue Rating	
With rated entity or related third party participation	No
With access to internal documents	No
With access to management	No

The rating was conducted based on the following information:

List of documents
Accounting and controlling
<ul style="list-style-type: none"> EDF's Universal registration document 2019 2019 Annual results appendices
Finance
<ul style="list-style-type: none"> EUR 45.0 billion EMTN Program Base prospectus from 14 September 2018 Final terms of the issues EDF Green Bond Framework from 20 January 2020
Additional documents
<ul style="list-style-type: none"> EDF's Annual results 2019 presentation Press releases EDF 2018 Performance Market researches and press artikles regarding energy markets development

A management meeting did not take place within the framework of the rating process.

The documents and information gathered were sufficient to meet the requirements of Creditreform Rating AG's rating methodologies.

The rating was conducted based on the following rating methodologies and the basic document.

Rating methodology	Version number	Date	Website
Corporate Ratings	2.3	29.05.2019	https://www.creditreform-rating.de/pub/media/global/page_document/Rating_Methodology_Corporate_Ratings_2.3.pdf
Government-related Companies	1.0	19.04.2017	https://www.creditreform-rating.de/pub/media/global/page_document/Rating_Methodology_Government-Related_Companies.pdf
Non-financial Corporate Issue Ratings	1.0	October 2016	https://www.creditreform-rating.de/pub/media/global/page_document/Rating%20Methodology%20Non-Financial%20Corporate%20Issue%20Ratings.pdf
Rating Criteria and Definitions	1.3	January 2018	https://www.creditreform-rating.de/pub/media/global/page_document/CRAG_Rating_Criteria_and_Definitions_v1_3_01-2018.pdf

The documents contain a description of the rating categories and a definition of default.

The rating was carried out by the following analysts:

Name	Function	Email-Address
Elena Damijan	Lead analyst	E.Damijan@creditreform-rating.de
Rudger van Mook	Analyst	R.vanMook@creditreform-rating.de

The rating was approved by the following person (person approving credit ratings, PAC):

Name	Function	Email-Address
Artur Kapica	PAC	A.Kapica@creditreform-rating.de

On 29 April 2020, the analysts presented the rating to the rating committee and the rating was determined. The rating result was communicated to the company on 4 May 2020. There has not been a subsequent change to the rating.

The rating will be monitored until Creditreform Rating AG withdraws the rating. The rating can be adjusted as part of the monitoring, if crucial assessment parameters change.

In 2011, Creditreform Rating AG was registered within the European Union according to EU Regulation 1060/2009 (CRA-Regulation). Based on this registration, Creditreform Rating AG is allowed to issue credit ratings within the EU and is bound to comply with the provisions of the CRA-Regulation.

ESG-factors

You can find out whether ESG factors were relevant to the rating in the upper section of this rating report "Relevant rating factors".

A general valid description for Creditreform Rating AG, as well as a valid description of corporate ratings for understanding and assessing ESG factors in the context of the credit rating process, can be found here:

https://www.creditreform-rating.de/pub/media/global/page_document/The_Impact_of_ESG_Factors_on_Credit_Ratings.pdf

Conflict of interests

No conflicts of interest were identified during the rating process that might influence the analyses and judgements of the rating analysts involved or any other natural person whose services are placed at the disposal or under the control of Creditreform Rating AG and who are directly involved in credit rating activities or in approving credit ratings and rating outlooks.

In the event of providing ancillary services to the rated entity, Creditreform Rating AG will disclose all ancillary services in the credit rating report.

Rules on the presentation of credit ratings and rating outlooks

The approval of credit ratings and rating outlooks follows our internal policies and procedures. In line with our "Rating Committee Policy", all credit ratings and rating outlooks are approved by a rating committee based on the principle of unanimity.

To prepare this credit rating, Creditreform Rating AG has used following substantially material sources:

Corporate issuer rating:

1. Annual report
2. Website
3. Internet research

Corporate issue rating:

1. Corporate issuer rating incl. information used for the corporate issuer rating
2. Documents on issues / instruments

There are no other attributes and limitations of the credit rating or rating outlook other than those displayed on the Creditreform Rating AG website. Furthermore, Creditreform Rating AG considers as satisfactory the quality and extent of information available on the rated entity. With

respect to the rated entity, Creditreform Rating AG regarded available historical data as sufficient.

Between the time of disclosure of the credit rating to the rated entity and the public disclosure, no amendments were made to the credit rating.

The Basic Data Information Card indicates the principal methodology or version of methodology that was used in determining the rating, with a reference to its comprehensive description.

In cases where the credit rating is based on more than one methodology or where reference only to the principal methodology might cause investors to overlook other important aspects of the credit rating, including any significant adjustments and deviations, Creditreform Rating AG explains this fact in the credit rating report and indicates how the different methodologies or other aspects are taken into account in the credit rating. This information is integrated in the credit rating report.

The meaning of each rating category, the definition of default or recovery and any appropriate risk warning, including a sensitivity analysis of the relevant key rating assumptions such as mathematical or correlation assumptions, accompanied by worst-case scenario credit ratings and best-case scenario credit ratings are explained.

The date at which the credit rating was initially released for distribution and the date when it was last updated, including any rating outlooks, is indicated clearly and prominently in the Basic Data Information Card as a "rating action"; initial release is indicated as "initial rating", other updates are indicated as an "update", "upgrade" or "downgrade", "not rated", "confirmed", "selective default" or "default".

In the case of a rating outlook, the time horizon is provided during which a change in the credit rating is expected. This information is available within the Basic Data Information Card.

In accordance with Article 11 (2) EU-Regulation (EC) No 1060/2009, a registered or certified credit rating agency shall make available, in a central repository established by ESMA, information on its historical performance data including the rating transition frequency and information about credit ratings issued in the past and on their changes. Requested data are available at the ESMA website: <https://cerep.esma.europa.eu/cerep-web/statistics/defaults.xhtml>.

An explanatory statement of the meaning of Creditreform Rating AG's default rates are available in the credit rating methodologies disclosed on the website.

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Creditreform Rating AG

Contact information

Creditreform Rating AG

Hellersbergstraße 11
D-41460 Neuss

Phone: +49 (0) 2131 / 109-626
Telefax: +49 (0) 2131 / 109-627

E-Mail: info@creditreform-rating.de
Web: www.creditreform-rating.de

CEO: Dr. Michael Munsch
Chairman of the Board: Prof. Dr. Helmut Rödl

HR Neuss B 10522