Research Update:

France-Based EDF Outlook Revised To Negative On Operating Woes

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Rating Action Overview

- Electricite de France S.A. (EDF) has announced cost overruns of £1.9 billion-£2.9 billion on the new Hinkley Point C (HPC) nuclear plant in the U.K., with the overall budget now expected to be £21.5 billion-£22.5 billion.
- This comes on top of €1.5 billion of cost overruns on the Flamanville (FLA-3) EPR, which has been postponed by three years following the French nuclear safety authority's (ASN's) June decision to require repairs on eight faulty welds, with the total budget rising to €12.4 billion.
- Although the incidents are not related, we believe that execution risks in new nuclear projects and operating issues at existing reactors will heighten pressure on the group's credit quality, translating to increasing capital expenditure (capex), an upward debt trajectory, and reduced financial flexibility.
- We are revising the outlook on EDF to negative, reflecting increased operational risks related to evidence of weak management of complex new nuclear projects, and the potential reduction of financial headroom if further risks materialize.

Rating Action Rationale

Our negative outlook on EDF highlights increased operational risks related to new nuclear projects, which results in lower cash flow predictability, and our belief the group is less likely to fulfill strategic projects. We believe the ongoing complex new nuclear builds contribute to the group's deeply negative free operating cash flow (FOCF) and that associated costs overruns exacerbate the company's rising debt trajectory. In addition, the cash flow contribution from these assets remains some way off, and we still have uncertainties regarding their value creation potential in case of further woes during the construction life.

Material cost and delay overruns for HPC and FLA-3 highlight operating risks related to new nuclear buildings.

On Sept. 25, 2019, the group announced higher estimated completion costs on HPC in the U.K., now estimated at £21.5 billion-£22.5 billion. This comes on top of an increase in the group's possible commissioning delay risk, possibly entailing a further £0.7 billion in costs. This is the second time EDF is revising up the HPC budget, and represents a 25% deviation from the initial budget of £18 billion in 2016. The overall return on investment will decrease subsequently to 7.6%-7.8%, a level closer to the company's weighted-average cost of capital. We think this is low in light of the project's construction risks, with a limited risk-sharing pass-through feature. The range provided depends on the effectiveness of action plans to be delivered in partnership with contractors.

The higher costs at HPC come on top of the commissioning delay at FLA-3 announced in July, with the reactor now postponed to year-end 2022 at the earliest. This followed ASN's June 19, 2019, announcement that welds would need to be repaired at the site. On Oct. 9, EDF announced a remedy plan, with associated cost overruns of €1.5 billion and the final schedule confirmed for year-end 2022. The total cost of the project amounts to €12.4 billion.

Although not correlated, we view the accumulation of issues at EDF's large nuclear projects as evidence of project management issues. In our view, this may be detrimental to the future of the group's strategic plan in nuclear power, notably regarding any additional domestic or international projects. We also note that the French economy minister has launched an independent audit on the French nuclear industry and on the decision-making around the EPR reactor technology, with the conclusions to be submitted on Oct. 31, 2019. That said, we believe that the French government still supports EDF's strategy (see section below on potential market reform).

Potential technical issues with six French reactors' steam generators increase EDF's operating risk.

EDF is also facing technical issues with the steam generators at six French reactors. The company and its nuclear reactor engineering division Framatome informed ASN on Sept. 9, 2019, of deviations from technical standards regarding the manufacturing of some steam generators installed in French power plants. EDF has identified the reactors potentially affected (six out of its fleet of 58) and discerned the nature of the technical issue--a quality deviation from a post-weld detensioning heat-treatment process on the steam generators. Nevertheless, the potential implications of any remedial work remain uncertain. Although EDF reiterated in its Sept. 18 press release that the reactors are safe to operate and require no immediate action, we believe this situation signals increased operating risk for EDF, and that its materiality will need to be assessed following ASN's further review.

We understand that ASN will provide a preliminary opinion in about a month. In the event of severe safety issues that require a shutdown of up to six reactors, nuclear output would be significantly lower than currently forecast and the financial impact could be material (see "Technical issues Signal Increased Operating Risks for French Power Company EDF," published Sept. 16, 2019, on RatingsDirect).

EDF's sizable capex puts pressure on cash flows and increases the debt trajectory.

Furthermore, EDF's sizable investment plans are leading to negative cash flows and rising debt. The plans include very high maintenance and upgrade expenditure on the existing nuclear fleet and construction of nuclear power plants in France and the U.K. This comes on top of ambitious investments in renewables and sizable investments in networks, leading to about €15 billion of spending each year. We believe this investment plan has very low flexibility. We anticipate that, under our power price assumptions (see below), these high investments will translate into large negative FOCF over 2019-2020 of €2 billion-€3 billion, with low visibility on working capital swings.

Our assessment of EDF's financial risk profile is underpinned by its high, adjusted debt, as a result of these sizeable negative cash flows and increases in nuclear/pension provisions in a lower-for-longer interest rate environment. Notably we forecast an increase in nuclear provisions in 2019-2020 of about €2 billion from a revision of the discount rate by 0.2%, and a potential risk that our adjusted credit metrics may weaken.

This effectively results in adjusted debt increasing by at least €3 billion per year, from about €70 billion in 2018 to above €78 billion in 2021, despite the credit supportive measures in the form of scrip dividends consented to by the French government (for a combined effect of about €1.5 billion) and asset disposals (€2 billion-€3 billion over 2019-2021).

However, we also expect EBITDA growth to accelerate over the forecast period, supported by power prices, resulting in adjusted funds from operations (FFO) to debt remaining above 19% (19.4% in 2018, under our new ratios and adjustments calculation) and debt to EBITDA remaining close to 4.5x over 2019-2021. Nevertheless, we expect management will remain committed to its financial policy and maintain its willingness to take further remedial measures to protect the group's credit quality over the coming years.

A potential change in regulation for French nuclear operations in 2020-2021 could support the rating.

Since EDF presented its 2018 results, we view positively management's clear and stated focus over the past few months on two structural pillars for the group's credit quality. These include potential changes to the regulation of its French nuclear activities in 2020-2021 and, if it materializes, the ensuing organizational changes. We note a strong alignment of interests on the regulatory need for these changes between the French government and EDF.

In our view, profound structural changes in the French market are needed to eventually reposition the economics of EDF's French nuclear fleet. Specifically, this means the recognition that sustainable remuneration is needed for baseload energy (the minimum amount of power needed to be provided to the grid), and a potential departure from Regulated Access to Incumbent Nuclear Electricity's pricing mechanism, which currently sets a partial cap on prices for the output of the existing nuclear fleet.

We understand a structural regulatory reform that is positive for EDF's nuclear operations will take time and will need to be agreed with the European Commission. Furthermore, we understand any proposal of group reorganization, as requested by the French state, would be linked to progress on the regulation and would most likely be delayed to first-semester 2020, as opposed to year-end 2019 initially.

The high likelihood of extraordinary state support continues to enhance EDF's credit quality.

The French state's recent decision (announced in February 2019) to elect for scrip the balance of its 2018 dividends as well as those in fiscals 2019 and 2020 supports our assessment of a high likelihood of extraordinary government support for EDF, if needed. This confirms a supportive stance from the French government, which was also shown in 2017 in the form of a capital increase and scrip dividends.

What's more, EDF is at the core of the government national energy policy Programmation pluriannuelle de l'énergie (PPE). The new energy roadmap over 2019-2028 highlights France's pro-nuclear stance and nuclear power's key place in the French energy mix for the next decade. PPE also sets ambitious targets to significantly increase the share of renewables in the generation mix, spurred by a push for new solar and wind capacity (see "France's New Energy Plan: Implications For The Power Market And EDF's Credit Quality," published Dec. 5, 2018).

Outlook

The negative outlook on EDF reflects our view of increased operational risks materialized through significant cost deviations and commissioning delays at new nuclear projects, namely FLA-3 and HPC.

We expect an increasing debt trajectory over 2019-2021 due to negative discretionary cash flows. We anticipate that the group's S&P Global Ratings-adjusted FFO to debt will stay at about 19%, and debt to EBITDA will remain close to 4.5x, in the context of a supportive power price environment.

Downside scenario

We could consider a negative rating action if we see no clear progress toward positively changing regulation for its existing French nuclear fleet (or on changes in market design). This would result in the persistent and high structural exposure of the group's cash flows to market volatility given its still-material investment phase.

Rating pressure would also stem from FFO to debt falling below 17% and debt to EBITDA failing to stay below 4.5x, levels we do not deem commensurate with our 'A-' rating. This could notably arise from further deviations in nuclear operations, a material upward revaluation of the group's nuclear provisions, or a sharp deteriorating price environment, although with a lag of two-to-three years due to hedges in place.

Upside scenario

A stable outlook depends heavily on the group's reorganization as well as the nature and effective implementation of EU-backed regulation, allowing the group to better cover the economic cost of its existing French nuclear fleet. Additionally, we would view favorably the implementation of remedy measures designed to reinstate financial flexibility.

Company Description

EDF is an integrated energy company operating in a wide range of electricity-related businesses: Generation, distribution, supply, and energy trading. It is France's dominant electricity operator and has strong positions in the U.K. through EDF Energy, and in Italy through fully-owned Edison, making it the world's leading electricity player. The company also manages the low- and medium-voltage public distribution network in France through its subsidiary Enedis, with a regulated asset base of about €51 billion at year-end 2018. French regulated activities accounted for 32% of 2018 EBITDA (versus 36% in 2017).

With worldwide installed capacity of 127 gigawatts (GW) as of Dec. 31, 2018, and global energy generation of 584 terawatt hours (TWh), EDF has the largest generating capacity of all the major

European utilities. The EDF group supplies electricity, gas, and associated services to almost 40 million customer accounts worldwide (of which more than two-thirds are in France). It has a significant proportion of nuclear and hydroelectric power in its generation mix, which represented 78% and 9% of electricity output respectively in 2018. Notably, EDF operates 58 nuclear reactors in France and 15 in the U.K., with a total capacity of 73 GW. French generation and supply activities accounted for 41% of 2018 EBITDA (versus 35% in 2017) while the U.K. and Italy each accounted for 5% (versus 8% and 7% respectively in 2017.

EDF Renewables, which develops the international new renewables activities (total net installed capacity of 8.3 GW; mostly wind) represents 6% of 2018 EBITDA. The other activities segment represents 11% of EDITDA. It includes Dalkia, which focuses on energy services as well as heating and cooling networks; and EDF Trading, which provides market, optimization, and risk management services via wholesale energy market operations.

At year-end 2018, EDF reported revenue of €69 billion, EBITDA of €15.3 billion, and adjusted financial debt of €70 billion. The group is listed on Euronext, with a market capitalization of €31.9 billion as of June 30, 2019. The French government is the main shareholder with 83.7% of EDF shares as of Dec. 31, 2018.

Our Base-Case Scenario

- Power prices of €43 per megawatt hour (/MWh) in France in 2019, rising to €45/MWh by 2020. In the U.K. climbing from £45/MWh in 2019 to £50/MWh in 2020.
- Assumed French nuclear fleet availability in 2019 to remain at or below 395TWh due to planned outages for maintenance and upgrades. However, we expect a drop to below 390TWh in 2021, reflective of the decoupling of the Fessenheim reactors' closure from the FLA-3 commissioning. We have not factored in any outages related to technical quality deviations on steam generators.
- Pressure on EBITDA in French supply activities because of increased competition and loss of market share.
- Further pressure on EBITDA in the U.K., due to extended nuclear outages, the introduction of a cap on supply margin, and the shutdown of the capacity market (with no revenue accounted in first-half 2019).
- Regulated activities to benefit from a tariff increase, mainly from second-half 2019, with 3.04% increase announced at the beginning of June 2019, including 1.61% for inflation and 1.45% to account for differences between estimated and actual tariff changes during the previous period (CRCP mechanism).
- A dividend payout ratio of 45%-50%, with the French state electing scrip dividends for the rest of fiscal 2018 and the whole of fiscal 2019 and 2020.
- Asset disposals of €2 billion-€3 billion in 2019-2021.
- Net investments of about €15 billion per year over 2019-2020, including capex linked to HPC in the U.K. and the deployment of smart meters Linky in France.
- An increase in nuclear obligations in 2019 of about €2 billion to reflect the expected lowering of the discount rate by 0.2% and actuarial effect. We expect this upward trend to continue in the lower-rate environment.

Based on these assumptions, we arrive at the following S&P Global Ratings-adjusted credit measures:

- Reported EBITDA rising to about €16.1 billion in 2019, with a faster pick-up from 2020 due to the progressive maturing of low hedges in place and due to favorable market prices for its generation earnings.
- FFO to debt remaining above 18% and debt to EBITDA remaining at about 4.4x-4.5x by 2021.
- Debt trending up on the back of continuous negative discretionary cash flows combined with expected increases in asset retirement obligations (dedicated assets contribution). Planned asset disposals and scrip dividends (elected by French government) mitigate only partly the cash outflows over the period.

Liquidity

We assess EDF's liquidity as strong because we project that its liquidity sources will exceed uses by more than 1.5x over the next 12-24 months. Our assessment is further supported by EDF's consistently substantial cash balances, solid relationships with banks, and ample and proven access to capital markets, even under dire conditions.

Principal liquidity sources as of July 31, 2019, include:

- About €23.6 billion cash and highly liquid marketable securities.
- €9.8 billion in available committed credit lines, out of which €0.8 billion is maturing in 2020 and €1.6 billion in 2021.
- Estimated FFO of about €13.1 billion in the next 12 months.
- About €660 million from the disposal of exploration and production activities.

Principal liquidity uses as of July 31, 2019, include:

- Short-term debt of about €3 billion and commercial papers of about €2 billion.
- Long-term debt of about €4.0 billion.
- Estimated capex of about €15 billion.
- Annual cash dividends of about €920 million, including €560 million dividends on hybrids and about €200 million dividends to minorities.

Debt maturities are well staggered at about €3 billion in 2019, and about €2.5 billion in 2020.

Environmental, Social, And Governance

We see EDF's management and governance as fair but weaker than peers. The major area of governance risk relates to EDF's board oversight and ability to manage risks and avoid cost overruns at multi-billion-pound EPR new-build nuclear projects. The company has embarked on two new EPR projects worth about £21.5 billion-£22.5 billion in the U.K. (HPC), for which total cost revisions of £3.4 billion-£4.4 billion have been announced.

Additionally, cost overruns for its first-in-kind EPR project in France FLA-3 currently amount to €9.5 billion, while we

expect further inflation of these investments following the ASN's decision on the eight welds inside the containment building. EDF may also suffer from legacy issues at Framatome, as seen with ASN's investigation of steam generators manufactured by the former Areva. Positively, we would highlight the supportive financial stance of the French government through capital injections and scrip dividends options.

Having one of the largest nuclear generation fleets (73GW capacity and 76% of output), EDF's carbon footprint is

markedly low. Profound structural changes are needed, however, to eventually reposition the economics of EDF's French nuclear fleet. We see positive signals starting with the recognition of a necessary sustainable remuneration for the carbon-free baseload energy and the key role that nuclear generation plays to meet the energy transition targets in Europe.

This advantage, linked to zero-carbon emissions and potential favorable regulation, is offset, however, by concerns about environmental (and social) risks relating to the future long-term storage of nuclear waste and the advanced age of the fleet. We capture EDF's large end-of-cycle liabilities (€50 billion), of both decommissioning and nuclear waste storage, in our asset retirement obligation debt adjustment, but the amount continues to be subject to a degree of uncertainty.

Social factors are important to our assessment of EDF's standing vis-à-vis the French state. We believe there remains support for the nuclear industry in France, given its economic and social stakes. France's updated energy policy, defined by the PPE proposals over 2019-2028, has the key objective of reducing the share of nuclear in the power mix to 50% by 2035 (from 75% today). This would require EDF to start decommissioning its plants as per the currently approved 50-year lifetime, partly from 2027 and progressively until 2035. At the same time, it could require sizable investments in renewables. This strategy will not alleviate pressure on the group's FOCF from sizable investments planned over an extended period.

Issue Ratings - Subordination Risk Analysis

Capital structure

At year-end 2018, EDF's capital structure consisted of about €69 billion of senior unsecured debt and about €10.7 billion of hybrid securities unsecured debt issued by EDF and its financing subsidiaries. The group also has debt of about €10 billion at subsidiaries.

Analytical conclusions

As a result, we do not see any material structural subordination risk on the senior unsecured debt instruments issued by the group and rate them 'A-', in line with the issuer credit rating on EDF.

In our analysis, we do not expect the French state to provide extraordinary support on the hybrid instruments. We therefore rate them 'BB', two notches below our analysis of EDF's 'bbb-' SACP, reflecting the subordinated nature of these instruments and the optionality to defer the coupon. If we revised our assessment of the SACP (down or up), we would not expect to change our approach related to the notching differentiation to assessing the hybrid's equity content. This is because the issuer credit rating would remain investment grade, all else being equal.

Ratings Score Snapshot

Issuer Credit Rating: A-/Negative/A-2

Business risk: Strong

- Country risk: Low
- Industry risk: Intermediate
- Competitive position: Strong

Financial risk: Significant

- Cash flow/Leverage: Significant

Anchor: bbb

Modifiers

- Diversification/Portfolio effect: Neutral (no impact)
- Capital structure: Neutral (no impact)
- Financial policy: Neutral (no impact)
- Liquidity: Strong (no impact)
- Management and governance: Fair (no impact)
- Comparable rating analysis: Negative (-1 notch)

Stand-alone credit profile: bbb-

- Group credit profile: a-
- Related government rating: AA
- Likelihood of government support: High (+3 notches from SACP)

Related Criteria

- General Criteria: Hybrid Capital: Methodology And Assumptions, July 1, 2019
- General Criteria: Group Rating Methodology, July 1, 2019
- Criteria | Corporates | General: Corporate Methodology: Ratios And Adjustments, April 1, 2019
- Criteria | Corporates | General: Reflecting Subordination Risk In Corporate Issue Ratings, March 28, 2018
- General Criteria: Methodology For Linking Long-Term And Short-Term Ratings, April 7, 2017
- General Criteria: Guarantee Criteria, Oct. 21, 2016
- General Criteria: Rating Government-Related Entities: Methodology And Assumptions, March 25, 2015
- Criteria | Corporates | General: Methodology And Assumptions: Liquidity Descriptors For Global Corporate Issuers, Dec. 16, 2014

- Criteria | Corporates | Industrials: Key Credit Factors For The Unregulated Power And Gas Industry, March 28, 2014
- General Criteria: Methodology: Industry Risk, Nov. 19, 2013
- General Criteria: Country Risk Assessment Methodology And Assumptions, Nov. 19, 2013
- Criteria | Corporates | Utilities: Key Credit Factors For The Regulated Utilities Industry, Nov. 19, 2013
- Criteria | Corporates | General: Corporate Methodology, Nov. 19, 2013
- General Criteria: Methodology: Management And Governance Credit Factors For Corporate Entities, Nov. 13, 2012
- General Criteria: Stand-Alone Credit Profiles: One Component Of A Rating, Oct. 1, 2010
- General Criteria: Use Of CreditWatch And Outlooks, Sept. 14, 2009

Ratings List

Ratings Affirmed; Outlook Action

	To	From
Electricite de France S.A.		
Issuer Credit Rating	A-/Negative/A-2	A-/Stable/A-2
Senior Unsecured	A-	A-
Junior Subordinated	BB	BB
Commercial Paper	A-2	A-2
EDF Energy Customers PLC		
Issuer Credit Rating	BBB-/Negative/--	BBB-/Stable/--
EDF Energy Limited		
Issuer Credit Rating	BBB-/Negative/A-3	BBB-/Stable/A-3