Case Study EDF (Electricite de France) July 2020

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The case explores role of strategic planning, technological evaluation and long term financial commitment in developing a successful State-owned enterprise

Abstract

Electricite de France (EDF) was founded in April 1946. It resulted from the nationalisation of around 1,700 smaller energy producers, transporters and distributors. Until November 2004, EDF was a state-owned corporation. It is now a limited-liability corporation under private law. The French government partially floated shares of the company[1] in November 2005. It retains, however, around 85% ownership. EDF has during its period of existence established a globally acknowledged expertise in the nuclear sector. This reflects the strategic commitment and investment of EDF - and the collaboration of other French industrial groups over the past 60 years – to the achievement of these goals.

The French nuclear sector is a world leader in fuel cycle management, (manufacturing, processing and recycling) and in nuclear power plant construction and maintenance. It has 2,500 companies and some 40,000 direct and indirect employees. Its investment in research and development currently stands around €1.8bn[2]. With €70bn in revenue in 2017, EDF operates a diverse portfolio of 134 gigawatts of generating capacity in Europe, South America, North America, Asia, the Middle East and Africa. It generated 616 gigwatt hours of energy in 2017 - the world's largest single generator of electricity. It also has a commitment to renewable energy. It supports an industrial incubator programme aimed at stimulating small business capacity in all relevant aspects of non fossil fuel development and energy storage. It represents an outstanding example of sustained strategic development in global energy markets. But there are issues.

1. Key points in EDF's long term energy strategy

EDF's creation

By Act of Parliament in April 1946 EDF was created as a State-Owned Enterprise according to OECD definitions. It also created a special status for the personnel of the electricity and gas industries. The law nevertheless left in existence a certain number of non-nationalised distributors and local distribution companies. In this early period EDF began a step-by-step development of its home industrial base including the construct6ion of hydro and nuclear power plants.

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[1] On the Paris Stock Exchange

[2] This represents a little under 2.6% of total revenue in 2017.

This was to supplement the coal and then fuel oil.[3] In 1963, EDF commissioned the first commercial-scale nuclear generation unit at Chinon in France (70MW), the first of a series of six generators using Uranium Natural Graphite Gas (UNGG) the construction of which continued until 1972. The oil crises of 1973 and 1979 led to accelerated use of nuclear power. In 1969, the UNGG process was abandoned in favour of the Pressurised Water Reactor (PWR) process, which was used for later power plants.

Overseas acquisitions

In the early 1990s, EDF embarked on a significant expansion outside France. This development focussed on South America and Europe. It acquired London Electricity in 1989. This was renamed EDF Energy in June 2003. Foreign expansion continued with the acquisition of 20% of the German company EnBW (a stake that was successively raised to 45.01% by 2005) and with the acquisition of equity interests in the Italian company Edison.[4] In 2002, EDF acquired EPN Distribution Plc. and Seeboard Plc., two England-based distribution companies.

A major development feature of the French electricity market has been the liberalisation of the market pursuant to European regulations. In February 1999, sites where electricity consumption exceeded 100GWh per year, (20% of the market or more), became entitled to choose their supplier. The eligibility threshold was then progressively lowered - liberalising further the market for non-household customers. Since July 2007, the market has been fully liberalised, including for residential customers. At the same time, the structures necessary for a competitive market to function effectively were set up.

2. EDF and the French economy

Nuclear energy in post war French economic development

EDF has been a major player in developing the French nuclear industry. It remains a world leader in nuclear power plant operation. AREVA, for its part, is a leading nuclear equipment manufacturer. It has been involved in the building and is involved in the maintenance of 360 reactors out of the 440 that exist worldwide. It also has a significant renewables business.Although leading groups like AREVA and EDF are heavyweights in terms of major contracts, other nuclear sector manufacturers also work on the design and maintenance of nuclear power plants throughout the world.

This is why the French public authorities have decided to structure the industry as a whole with production and processing units corresponding to each stage of the fuel cycle and to ensure proper and effective regulation at every stage. France is one of a few countries that have a comprehensive nuclear industry ranging from uranium conversion and enrichment, nuclear fuel production, spent fuel processing, and recycling. Such measures help strengthen cohesion among companies in foreign markets. It also enables SMEs and other “niche” companies to bid for important contracts. This would include initiatives such as VANATOME (nuclear valve design) and Lemer Pax (nuclear medicine).

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[3] Notably the dams at Tignes in 1952 and Serre-Ponçon in 1960.

[4] Edison is an Italian energy company in the field of electricity and natural gas. The company was established in 1884. Edison employs about 4,000 people in Europe, Africa and the Middle East. EDF agreement with ENEL the Italian generators and distributor was terminated in 2012 in the face of continuing construction difficulties with the EPR reactor in Flamanville.

Making safety and security a priority
Nuclear energy is particular as an industrial activity because it demands a special regulatory and institutional framework. It also requires key resources, skills and know-how to guarantee levels of safety and security that are essential. This is particularly the case since the Fukushima nuclear disaster in 2011. People have become aware of the fact that societies "must prepare for the unthinkable". There is no zero risk stop gap. There is an overriding need to ensure that an incident can be swiftly controlled to prevent discharge of radioactivity into the atmosphere.

In view of its long-standing know-how and expertise the French Nuclear Safety Authority (NSA) is called upon to provide advice on all aspects of nuclear safety The creation by the Japanese authorities of an independent control and safety institution, is largely modelled on the French NSA. Major reactor-building projects worldwide have firmly established EDF's position as a lead global player. Installed capacity stands at around 616,000 GWh. Europe accounts for 547,000GWh followed by the Americas with 34.000 GWh and Asia with 14,000GWh respectively.

Analysis of EDF turnover and energy source
Nuclear industry exports are sometimes mistakenly represented in terms of the building of new nuclear reactors alone. This ignores the importance of revenue from the servicing of the reactor base and reactor needs in terms of nuclear fuel and a range of other support services. By way of a perspective EDF currently exports around €2bn in electricity to near European countries. This compares with around €6bn worth of project management and fuel recycling advisory services.
With revenues currently in the region of €71.2bn (around 3% of French 2016 GDP) EDF operates a diverse portfolio of 130+ gigawatts of generation capacity worldwide. It remains the world's largest producer of electricity. It currently produces around 22% of EU electricity, primarily from nuclear power:

The breakdown in its energy output by type is as follows:
nuclear: 64.3%;

renewable energy: 12.3% (includes 4.6% hydroelectricity);

gas: 8.6%;

coal: 14.5%;

other: 0.3%.

3. Corporate governance and corporate social responsibility

Corporate governance
The EDF corporate governance structure makes no clear division between executive directors and independent directors. In practice it means that independent directors sit on the main board of EDF France but there is no clear independent supervisory board within that structure as

would be the case in Germany and other Rhineland jurisdictions.[5] The executive board does have members that represent wider interest than those of EDF Energy France. Notably the French State Shareholding Agency (APE) is represented on the executive board.[6] The executive board also has directors nominated by the main trade unions. But strikingly the significant role of the executive directors in the governance of the EDF Group is very clear.[7]

Why is this, in itself, of such significance? It is because of the exceedingly complicated nature of the EDF business and its existence as a limited liability SOE. There is a powerful case for arguing that because of the concentrations of political and economic power which surround EDF there is a need for a very strong and independent supervisory board. Only in this was can the enormous temptation at executive board level to turn CSR duties and responsibilities into "marketing opportunities" be resisted.[8] Though the APE claims, in very clear terms, that it represents the higher interests of the state and its citizens in the governance of EDF it cannot credibly assure the outside world that the very highest standards of transparency, verification and authentication will be maintained.

Making verifiable and accountable CSR claims

EDF operates within an elaborate framework of corporate responsibility. It claims that its wide ranging socio-economic objectives are supported by a strong and pluralist set of governance arrangements. These claims will be examined closely.

EDF has set out six main corporate responsibility goals for the group to deliver by 2030. They are as follows:

- To go beyond the climate change requirements of the 2◦ target set by COP[9] 21 by dramatically reducing CO2 emissions
- To adopt industrial best practice in terms of human development, health and safety, gender diversity and social advancement
- To offer all vulnerable people information about support with energy use and energy benefits
- To innovate through digital energy efficiency solutions to enable all customers to use energy better
- To systematically organise a process of transparent and open dialogue and consultation for every new project around the world

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[5] The clear distinction as between powers in Rhineland jurisdictions makes it clear that the supervisory board has the duty and the power to provide strict and focused oversight.

[6] The APE declares in its own statement that it has responsibilities for reviewing the "appropriateness" of the company. In translation from French into English some misinterpretation may have arisen. But on the face of the words used it appears that the APE might have a duty to question and challenge complicated socio-political interpretations around the progress of EDF in achieving its wider CSR goals.

[7] This must raise questions about the countervailing influence of independent directors

[8] This is a frequent criticism of unitary boards and their treatment of CSR in Anglo American jurisdictions.

[9] COP refers to Conference of the Parties – part of the UN climate change initiative

- To launch a positive approach to biodiversity, not limited to understanding and reducing the impact of our activities in the long run by having a positive impact on biodiversity.

Independent verification and authentication of progress on any and all of these fronts raise formidable challenges. They will require a robust independent structure which ensures right and proper accountability. Existing control structures do not offer wholly credible evidence that such outturns can be delivered.

4. Some serious unresolved technological challenges

Will the merger with AREVA resolve long standing problems?
A major challenge now facing EDF is the successful resolution of the problems that have afflicted the EPR power plant (European Pressurised Reactor). A major step in resolving this challenge centres on the state-approved acquisition by EDF of the nuclear manufacturing and construction elements of the AREVA business. AREVA is a nuclear power constructor owned by the French state specialising in nuclear power engineering design and manufacture and renewable energy.

In 2017 the majority of AREVA's reactor business, Framatome, (previously AREVA NP) was sold to ÉDF. Japan Nuclear Fuel Limited and Mitsubishi Heavy Industries will take a 5% stake each in another new company created called ORANO. This will run the existing and successful nuclear fuel business of AREVA. This leaves EDF with the formidable challenge of resolving difficulties with third-generation EPR plant previously built jointly by EDF and AREVA.[10] The Flamanville EPR reactor was supposed to be operational by 2012. It claims to be one of the safest reactors in the world, and the most energy efficient. But serious engineering problems have yet to be resolved.

France's nuclear renaissance and renewal programme built around EPR technology will see the country's aging nuclear plants replaced over time. However the Flamanville 3 setback in Northern France is a major setback. Similar delays have been experiences at the Olkiluoto 3 (OL3) reactor project in Finland. Concerns are now mounting in respect of the Hinckley Point C reactor project in South West England which is being constructed by EDF using EPR technology which carries the same risks. EDF have so far resisted moves by commissioning parties seeking compensation.

5. Evaluating the Case

Try to provide answers to the following questions:

1. Explain from your reading of the case what the reference "strategic commitment to and investment of EDF" means?
2. What evidence is there of EDF's commitment to "renewable"?
3. What evidence supports the claim that EDF is a world leader in fuel cycle management?
4. Given the complex and potentially catastrophic consequences of nuclear disaster how well equipped is EDF to monitor and control the behaviour of the many subcontractors in

[10] This includes the settlement of compensation claims and "guarantees" on future work.

France and outside France who might be involved in direct supervision?

5. How can the French Nuclear Safety Authority claim to have effective oversight of nuclear contractors and sub contractors and their activities outside France?

6. How does EDF by its policies support the efforts of SMEs?

7. What were the key influences which drove EDF into nuclear energy at the early stage in its development?

8. Why is the statement that "EDF gets revenue not just from building power stations but also from providing a wide range of other support services" so important? What are these other support services?

9. What in your view are the weaknesses of governance in EDF given its size and importance as a SOE?

10. Why does the case warn against unitary board structures taking a "marketing approach" to CSR?

11. What benefit does the APE (the French government shareholding agency) bring to EDF's corporate governance? What are its limitations?

12. Why are the concepts of transparency, verification and authentication so important to effective CSR?

13. Why is the caveat concerning the "complex socio political interpretation of progress around the realisation of EDF's CSR objectives" so important?

14. What particular problems will arise as a result of the merger of EDF and AREVA's nuclear power business?

15. How will the complex issues of damages from EPR plant delays be resolved?

16. How will issues of damages be even-handedly be settled by the EDF executive board?

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