

Digital technology at Engie: Which organization for which business model?

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Abstract:

The digital revolution is disrupting the energy industry, like other sectors earlier. New methods for managing production, the reinvention of customer relations, the proliferation of “smart” devices... the digital revolution is radically altering business models. Systems used to be centralized, based on a few big production plants and unidimensional network; but now they are becoming horizontal and variable. The boundary between producer and consumer is disappearing. Time is speeding up: the era of long-term investments in big industry is over. The decentralization of installations and the power of software imposes a rapid pace and an iterative conception of “test and learn”. In this new world, stakeholders in the energy sector have no other choice than to invent new, agile work methods and increase the firm’s potential for innovation.

In many a branch of the economy, the passage toward a digital economy and society has upended business models and threatens established positions. The retail trade has been transformed by on-line sales; information and news, by the social media; the production of films and music, by digital platforms and streaming; the banking and insurance industry, by mobile payment systems, blockchains and the entry of newcomers (“pure players”); and so forth.¹

Will this tidal wave spare the energy sector? At first sight, the relation between energy and digital technology simply seems to be a customer/supplier relationship: without electricity, no networks, no computers, no smartphones and no data centers. According to some estimates, digital technology accounts for up to 10% of the planet’s consumption of electricity, a percentage that has not stopped rising year after year. But this is not the whole story. The digital revolution is on the march in the energy sector and has an impact on our activities all along the chain. It is completely redefining methods of production as well as relations with customers. It is creating new businesses that accelerate changes. It is orienting the energy sector toward activities downstream on the value chain: energy efficiency, decentralized production units, smart grids and infrastructures, “green mobility”, plans for “smart cities” — literally a paradigm shift. As a catalyst of the energy revolution now under way, digital technology forces us to review not only our business models but also our corporate organization and culture.

¹ This article has been translated from French by Noal Mellott (Omaha Beach, France).

The digital revolution in energy, a paradigm shift

Production: Managing complexity and optimizing industrial assets

Thanks to digital technology, we are more capable of steering and coordinating a complex system comprising thousands of scattered points of production. This management is all the more crucial given the development of renewable sources of energy, which are much more dispersed and numerous than traditional (fossil fuel or nuclear) power stations. To be competitive and improve the security of the electricity supply, it is necessary to develop predictive maintenance and achieve excellence in the operation of these assets.

In the front rank of wind and solar power in France, Engie has installed at Châlons-en-Champagne a center for monitoring renewables. This center manages 100 wind farms (825 turbines) and 17 solar powerplants (105,000 solar panels) — a vast set of industrial locations geographically dispersed over six European countries. Thanks to the power of digital technology, this recentralization in Châlons of the management of ever more numerous production units makes it possible to lower costs, bolster the security of installations, optimize the predictive maintenance of plants as well as the quality of the data transmitted to RTE (Réseau de Transport d'Électricité, the transmission system operator in France) and better predict the production of wind power.

In addition, Engie equipped itself in 2017 with Darwin, a worldwide digital platform that collects a maximum of information in real time from wind, solar and hydroelectric plants and from their environment: the rotation speed of wind turbines, the temperature of solar panels, the output of energy, weather forecasts, the market price for electricity, etc. All these data are used to optimize the operation of installations, better plan maintenance work and increase production and, thus, the company's profit-earning capacity.

Sales: Closer relations with active consumer-customers

Traditionally, customers have had intermittent relations with their energy company. Apart from a few specific occasions (receipt of the invoice, moving, maintenance of a furnace, etc.), the customer did not pay much attention to his energy consumption or relation with the supplier. This will change as smart meters and applications for managing consumption develop. Better equipped to monitor and understand their consumption, consumers will eventually change their consumption patterns or use this knowledge to plan home maintenance projects. For customers, this is an opportunity to become a fully responsible consumer active in steering their consumption. For energy companies, it is the chance to draw closer to customers and offer them new services.

Since 2017, Engie has been proposing to its customers who are equipped with smart meters (Linky or Gazpar) Mastermind, an on-line application for better understanding their electricity or gas bills, predicting the amount of their next bill, adjusting monthly payments and offering advice based on simulations for saving energy. Via a detailed invoice, the customer can assess the impact of home improvement projects or of changes in consumption patterns. Customers can thus compare their current consumption with their consumption over the past year or with the consumption of a household of the same size in the same region.

New businesses: Smart everywhere

Smart homes, smart lighting, smart (battery) charging, smart traffic, smart cities, smart (street) lighting, smart (electricity) grids... behind all of this is the Internet of Things (IoT) with its sensors, big data and algorithms for data analytics and with the objective of continuously optimizing energy consumption and operations throughout the system, from the smallest (an apartment) to the biggest (an electricity grid or a city) units. This “smarting” of things holds promises for saving energy, improving comfort, adding value and creating new jobs. Engie has acquired technology in firms for smart charging (EVBox, the European leader for recharging electric vehicle batteries), smart lighting (Flashnet), 3D-models of buildings (SXD, the Building Information System), smart micronetworks (EPS) and smart cities (Siradel). The intent is to improve the design and operation of these tools.

Engie is sufficiently mature to be able to deploy worldwide digital platforms. These platforms cover all segments of the firm’s market (industry, the building trade, retail services). For instance, we have just launched Livin, a digital platform for cities. This platform for connecting data and services will continually evolve to optimize and fluidize the operation of infrastructures, offer an optimal view of urban equipment and make forecasts thanks to predictive analytics (e.g., knowledge about the population trends in the city so as to decide where to open a school or hospital). All these data can be collected by, and centralized on, our interoperable digital platform. They will be open to other stakeholders in the urban area, in particular start-ups. The objective is to have a view as complete as possible, a possibility offered by algorithms. This platform is already active in our partnership with La Baule. It will centralize data on traffic and parking; and it should soon be able to aggregate data on street lights. The city will thus be able to supervise its installations and manage the urban area soberly and harmoniously.

Digital technology: The key to tomorrow’s energy system

How to maintain an equilibrium in an electricity system that has become complex and versatile? The characteristic of tomorrow’s system will be its dispersion. For wind power in France, there are already nearly 7000 towers erected on 1100 wind farms.² In June 2017, 391,571 solar (photovoltaic) installations were connected to the grid.³ The grid will be more versatile both on the supply side (owing to the development of intermittent renewables) and on the demand side (as a consequence of the growing number of electric vehicles and of the unforeseeable consumption of self-produced electricity). To ensure the grid’s equilibrium, it will be necessary to have sufficient computational power for processing data in real time and assisting decision-making. Thanks to the digital revolution, the energy revolution is possible.

The digital revolution radically shifts paradigms. We are switching from a centralized system based on a few big production units and unidimensional grid toward a horizontal but highly variable system managed in real time. The boundary between producer and consumer is disappearing. The job of energy companies will evolve toward offering services. Instead of trying to provide more energy to customers, they will try to help them consume better and less. Furthermore, time is undergoing an awesome acceleration. Whereas big industrial assets used to require investments over a long period, the decentralization of installations and the power of software are setting a fast pace and introducing an iterative conception based on “test and learn”.

This paradigm shift obviously has to be reflected in the organization of firms and the management of work teams.

² <http://fee.asso.fr/wp-content/uploads/2017/09/2018-03-03-Observatoire-de-lEolien-2017-VF5.01.pdf>

³ <http://www.statistiques.developpement-durable.gouv.fr/publicationweb/40?type=versionimprimable>

Creating a learning organization

Decentralizing

Engie is seeking to match the decentralization of the grid with a decentralization of its own organization. Three years ago, the company adopted a horizontal organization. In place of the five big branches of business, we created 24 geographically based operational units. The number of rungs in the hierarchy of corporate functions has been limited to four; and the level where decisions are made has been lowered. Operational units now have a wider margin for making decisions on crucial subjects, such as strategy in the middle run, their assignments and human resource management. The role of headquarters is, above all, to back up and support these units.

Facilitating decision-making

In an accelerating world, we are also speeding up decision-making. We have, for instance, set aside a budget of €1.5 billion over three years for new businesses and digital technology. The decision-making process for these investments has been designed to be more reactive, faster, than the procedure long used for the group's investments. Our motto is "A quarter is a year". This acceleration means adopting agile methods, in particular for developing digital solutions. Our objective is to make faster, smaller-sized deliveries thanks to iterative improvements due to feedback from customers and users. This formula has already been used to launch 25 products. Every year, approximately 3000 employees participate in projects of innovation based on the agile method.

Agility and "transversality"

In a world upended by the digital revolution, where tomorrow's business models are yet to be invented, we want to instill a new "corporate culture" that encourages employees to take risks and that makes the organization sufficiently supple to boost collective intelligence. To encourage in-house innovations, we have set up Innov@ENGIE, a platform where employees can file ideas for new businesses and select start-ups as partners. During the last three years, approximately a hundred employees have seen their plans receive Engie's backing. In-house innovation is celebrated during the annual ceremony "Trophies of Innovation". To free work teams from the fear of failure, we deliver an award for the "best failed idea".

Other actions see to it that Engie remains an agile organization where collaboration and collective intelligence override processes. For this, we have created a ritual "Is There a Better Way?" for asking work teams to take a fresh look at their habits and assess them without concessions. Why was such-and-such a process adopted? Is it still relevant? Can we improve it? We also encourage the formation of "transversal communities of practices", an emblematic example being the "data scientist tribe".

The digital driving force of change

Digital technology is not just a force pushing the firm to change its organization and culture. It is the driving force of change. The firm's social media, Yammer, already has 100,000 members involved in hundreds of "communities". We are rolling out in house Microsoft Office 365 and its cloud services. These tools make it easy to exchange ideas and information among employees who do not work at the same place or in the same plant or department. Digital applications also help temporary project teams to form.

Engie is developing Skill'Lib, a platform for wage-earners who want to share their skills (whether acquired from past experiences or from hobbies) with a firm that has a temporary need (from one day to twelve months). This is an alternative to temporary job placement agencies or consultants, two solutions that require a budget and entail a period of acculturation for "temps" in the group. It is also a way to let some wage-earners invest themselves in projects of interest to them and participate in the group's growth and performance by using the skills they claim to have.

A very good example of this more horizontal organization that relies on collective intelligence and digital tools is "Imagine 2030". This project, launched in April 2018, is an exercise in anticipating the group's future activities by imagining the world in 2030. Engie's 150,000 employees have been asked to take part in a decentralized debate in order to identify the key trends that will shape our world during the next decade, assess the impact of these trends on our work and imagine the new Engie that we want to build together. All employees have access to an online platform for posting views, their own and those of stakeholders. Assisted by software using artificial intelligence, a report of the major trends will be made for the executive committee, to help it discuss the strategy to adopt for the coming years.

Transformation of the energy sector, of business models and of the corporate organization: the energy sector is clearly at the center of the digital revolution.