
ENGIE: Powering the Energy Transition With Data



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What does it take for a utility company to develop a data- and AI-driven software business?

In Robert Heinlein’s 1940 science fiction story “Let There Be Light”, the discovery of light panels allows anyone to tap on energy from the sun at almost no cost. While the group of energy companies known as the ‘Power Syndicate’ attempts to preserve its monopoly by stopping dissemination of the technology, its failure eventually leads to the disruption of the energy business.

This short story may have been written more than 80 years ago, but with the ongoing energy transition, it is a timely reminder of impending “disruptions”. Globally, electricity generated by wind and solar energy multiplied more than 50 times between 2000 and 2019, and in 2020, renewable sources accounted for **29 percent of global electricity generation**. The use of distributed energy generation (including solar) and storage systems in homes and other facilities is set to increase rapidly. All this will fundamentally change the power system.

In fact, the shift from fossil-based fuels to carbon-free renewable sources is shaping our world – not only on the technological front, but socio-economically as well. Beyond how energy is produced, distributed and consumed, the shift disrupts the way utility providers traditionally operate. It also pushes energy companies to develop new business models and products.

One such emerging concept is the development of innovative technology-enabled services that can transform the way we manage and consume energy. The software-as-a-service (SaaS) subscription model, which has disrupted the software industry and reinvented its operation and revenue models, can be adapted to the delivery of new services in the energy sector. The end-to-end management of a customer's energy assets and services opens opportunities to improve energy efficiency and ultimately, lower carbon emissions. The possibilities are endless.

The future of energy is digital

In April 2017, the Ohio State University's board of trustees approved a 50-year concession to reduce the carbon footprint of its 485-building campus, one of the largest in the United States. The two-year process saw students, faculty and staff reviewing 40 different bids. The winning bid, valued at US\$1.165 billion, was made by the ENGIE-Axium consortium, with a commitment to increase energy efficiency by at least 25 percent in the first ten years (equivalent to US\$250 million in energy savings).

"Today, thanks to our experience with previous projects and digitalised tools, we can model exactly how much energy we can save. This puts us in a better bidding position compared to our competitors," said Olivier Sala, Group Vice President of Research and Innovation at ENGIE.

At that time, Sala was CEO of ENGIE Digital, which produces energy and carbon emission management products that employ artificial intelligence (AI) to optimise campus energy consumption. These digital solutions are not only used by ENGIE's global business units, but have also been commercialised and made available to external clients.

This riff on the SaaS model is radically different from the traditional business model whereby utility companies produce, distribute and sell fossil fuels through a centralised network, in which data flow from the producer to consumers. Such a model, along with the transformation of the energy

sector, is made possible with data and technologies such as AI.

Trading coal for data: The birth of ENGIE Digital

In early 2016, ENGIE announced that it would invest heavily in low-carbon, distributed-energy assets and energy services such as heating and cooling networks. Digitalisation was seen as an opportunity to support the new strategy.

ENGIE Digital was born to provide digital services at the group level, with two key strategic thrusts: to improve customer relationships and create new value for them through digital applications; and to transform the company in an industry 4.0 model by digitalising ENGIE's industrial assets and activities. The creation of this new subsidiary not only impacted organisational structure, but signalled the beginning of a new corporate approach – how the leadership perceived digitalisation – loud and clear.

Change is almost never without challenges. From experimentation of digital solutions to the implementation of digital projects in various business units, strategic decisions and trade-offs must be made. In our [case study on the evolution of ENGIE](#), current and former senior management discuss how the successful transformation of the entire group hinges on multiple factors such as the motivation, technical competencies, risk-taking behaviours and leadership of individual business units.

Road to digital transformation

The case discusses ENGIE's transformation as a journey, whereby the focus changed over time as the organisation's digital maturity grew. In the early stages, the company developed hundreds of digital and data proofs-of-concept (POCs), but with limited success in transitioning from POCs to commercial products. While this may seem unproductive, it was a necessary step in this bottom-up digitalisation process.

Core to this transformation was a review of the organisational, governance and financial elements to support a new operating model. Structurally, each digital platform ("product") is governed by a board that oversees strategy and budget, and an operational committee focused on developing features and managing operational matters. The introduction of SaaS-style licensing as part of the new financial model was instrumental in encouraging risk taking, which is necessary for exploration and eventually value creation.

Moreover, the transformation from a project-based to a product-based approach requires a rethinking of people, processes and practices. It requires new skills such as data science, more expertise in product management and change management, as well as the creation of new units. Keeping a balance between a business-oriented culture and a collaborative culture between ENGIE Digital and the rest of the organisation was key.

Sala explained, “We wanted to avoid being similar to a software company with a classic customer-supplier model, the business units being customers and ENGIE Digital being the supplier. Instead, we tried to build the best collaboration process possible, involving the people who knew the business.”

Data leads the way

With digitalisation, the availability, access and quality of data is put in the spotlight. In parallel with the introduction of ENGIE Digital’s new operating model, a new entity called Data@ENGIE was established in 2018 to drive the data transformation of the group.

While facilitating data transformation at a local level, Data@ENGIE also centrally managed a corporate data lake that contained all data sources used by the business units. This “common data hub” was a centralised way to solve the increasingly complex issues around data, although tackling data quality at a scalable centralised level is a challenge in itself.

Data@ENGIE started out like ENGIE Digital. Both started in an “experiment-learn-scale” mode and provided support services for the whole organisation. Initially, they were centrally financed.

Since then, the company has progressed in three key areas towards being a truly data- and AI-driven company over time. First, it created a “group performance cockpit”, leveraging operational data from the common data hub to help pilot the business at every level – from top management to operational entities. Second, it designed an operating model where ENGIE’s global business units drive the digital and data roadmap of the company in collaboration with ENGIE Digital. Finally, it set up strategic research and innovation programmes at the group-level on critical topics like AI and energy management systems.

ENGIE has come a long way in its data and digital transformation journey. As an early mover in the energy transition, it has paved the way to new

opportunities from the perspectives of energy transition, environmental sustainability and value creation. As the transformation unfolds, it continues to seek answers to questions like, “How can AI be AI for good?” The journey is far from over.

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