

The background image shows two utility workers in high-visibility vests and hard hats standing at night next to a large metal power transmission tower. The scene is illuminated by a bright light source, possibly a flashlight, creating a strong contrast against the dark night sky. A white, curved line graphic is overlaid on the image, starting from the bottom left and curving upwards towards the right.

ESO provides British electricity customers with flexibility service

The Electricity System Operator (ESO) partnered with Capgemini to rapidly design and launch the Demand Flexibility Service to respond to the drastic disruption to global supplies of energy caused by external factors such as the war in Ukraine.

Disruption is a constant across every industry and the ability to adapt has always been a defining trait of leaders. The utilities sector has seen a particularly high degree of volatility in recent years as demand and innovation have introduced both new challenges and opportunities.

The war in Ukraine presented the most recent and substantial of these disruptions. When access to energy imports from Russia ended, countries around Europe faced potential energy shortfalls. Electricity System Operator (ESO), the organization responsible for maintaining supply and demand of electricity in Great Britain, realized the threat of this disruption. It wanted to get ahead of the challenge to ensure the lights would stay on for households and businesses.

Client: Electricity System Operator

Region: United Kingdom

Industry: Energy Transition and Utilities

Client Challenge:

As the global energy system was disrupted, ESO set out to expand and further develop a first of its kind balancing service that enabled businesses and individual households to voluntarily moderate their electricity usage during peak periods.

Solution:

ESO partnered with Capgemini to rapidly scale and deploy the Demand Flexibility Service, agree on its use within the industry, and deliver a change management campaign to launch the service in time for winter.

Benefits:

- More effective management of limited electricity during peak winter periods
- Rapid development, approval, and deployment of new service
- Empowerment of individual households and businesses to decrease electricity demand
- Reduced carbon intensity of GB electricity



“Power is always essential, but even more so during the winter season. Given the heightened unpredictability of the 2022/23 winter we required additional tools to manage both supply and demand” explains **Jon Wisdom, Head of Market Change Delivery, ESO**. “As we were looking for solutions to add to existing market options, consumer flexibility offered a clear solution as a potential way of managing demand.”

To more effectively support its customers and meet demand, ESO decided to create a service that would allow different businesses and individual households to voluntarily adjust their energy usage during peak periods. By incentivizing consumers appropriately, the service would lower demand when needed in order to provide continuous service without interrupting power unexpectedly due to a potential supply shortage.

“With a system that would allow volunteers to pitch in, everyone could do their part to help with the situation,” says Jon. “That meant building a system that would enable volunteers to reduce their usage during designated times and, of course, be properly compensated for their effort.”

Clarifying usage and system requirements

As ESO began to build the service, the team realized that it needed a partner to fully define the work that would need to be done in order to take the scheme live as quickly as possible. This led the company to partner with Capgemini to manage a team drawn from across ESO to design the service, secure regulatory approval, and build the processes and tools to run the service and get the ESO and industry ready for launch.

“To move at the kind of speed that was needed, we needed to do more than just develop as quickly as possible,” explains

Jon. “We had to make sure that we were ready to clear every potential hurdle in our path. We adopted a ‘progress over perfection’ mantra to ensure the complexity of the project wouldn’t prevent us from realizing our vision and delivering the service as needed. And that’s where Capgemini came in.”

Working together, the ESO and Capgemini teams performed a thorough review of the technical requirements of the service and designed the end-to-end process that dictated how it would be used. In doing so, the organizations determined how ESO would sign up new providers, decide when to use the service, run an auction based on when the service would be needed, assess delivery of demand flexibility, and pay providers for the amount of electricity flexed post-event.

During this process, 12 different teams from across ESO and a working group of industry subject matter experts came together to co-create the detailed process steps, which were supported by an iteratively developed Microsoft Power Platforms-based suite of tools, and ensure they would be fit for purpose. The collaboration between the project and IT department teams accelerated the tool’s development, resulting in a delivery time of just four weeks. Through these activities, ESO and Capgemini defined how the service would operate and be used while establishing a foundation for continuous improvement that would extend beyond the launch.

“Obviously one of our top priorities was assisting with the initial launch, but no project really ends with a scheduled release,” says **Tom Carr-Lidström, Senior Manager at Capgemini**. “We had to ensure that once everything was in place and the scheme was operating, it could be updated and improved as needed. In this industry, disruptions can happen at any time and come from so many sources that major providers need to be ready to adjust, so we really wanted to leave ESO with the ability to transition as needed.”

Preparing for a rapid scheme launch

In addition, the project team developed a change management programme that would fully prepare the organization for the launch. Detailed change impact assessments for individual teams helped with the development of end-to-end guidance and the delivery of tailored communication and training to help ESO stakeholders through the process of getting up to speed with the new demand flexibility service.

By doing so, the organizations ensured that ESO would be prepared on day one to incorporate demand reduction into the control room's operation of the British electricity system. In addition, the teams were educated regarding how system conditions would be analyzed, how the service would be used alongside other emergency actions (such as winter contingency coal contracts), and the governance for decision-making.

"Working with Capgemini, we were able to get everything developed, all regulatory requirements met, and an entire educational program in place within four months," describes Jon. "That timeline was incredibly intense but essential for us to properly manage the winter season and avoid any service disruption. Capgemini was essential throughout this process. Without both of us working together, it would have been incredibly difficult to move at enough speed to accomplish the service that we needed."

Preparing for future peak periods

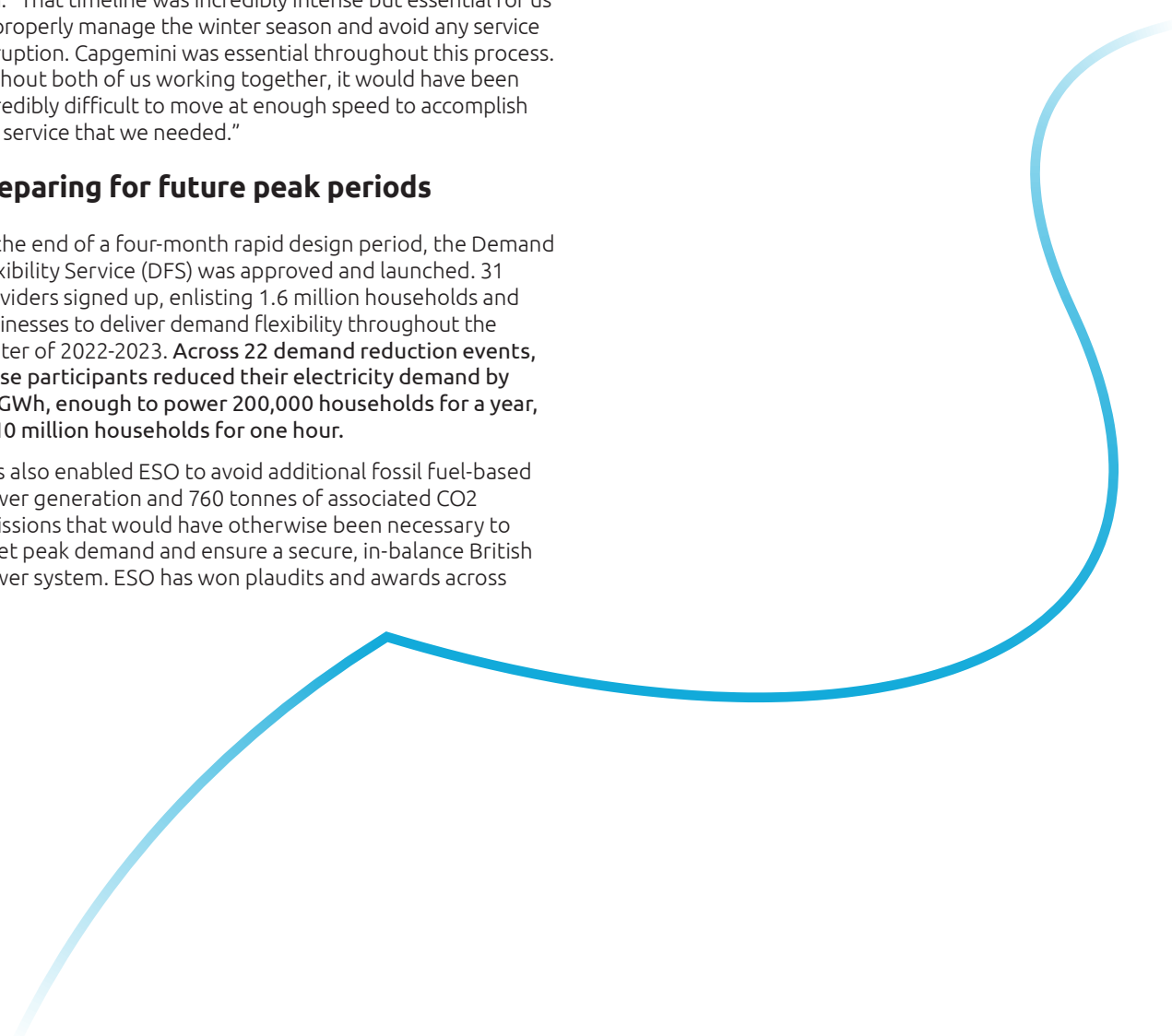
At the end of a four-month rapid design period, the Demand Flexibility Service (DFS) was approved and launched. 31 providers signed up, enlisting 1.6 million households and businesses to deliver demand flexibility throughout the winter of 2022-2023. **Across 22 demand reduction events, these participants reduced their electricity demand by 3.3GWh, enough to power 200,000 households for a year, or 10 million households for one hour.**

This also enabled ESO to avoid additional fossil fuel-based power generation and 760 tonnes of associated CO2 emissions that would have otherwise been necessary to meet peak demand and ensure a secure, in-balance British power system. ESO has won plaudits and awards across

industry for the project, including the Net Zero Engagement award at the Utility Week Awards in December 2023.

"We have continued to use the Demand Flexibility Service as an additional tool to support our control room in managing the energy system", says Jon. "But while the future is obviously critical, it's also important to reflect on how quickly our collaboration was able to bring the DFS together and how many people pitched in to help get through the last two winters. We feel incredibly confident about the future of flexible demand in Great Britain."

Following the success of the DFS' launch, ESO and Capgemini have since supported the design, launch, and operation of an expanded service for the winter of 2023-2024. This further expanded the scale of the service, securing demand flexibility from >2.6 million homes & businesses and experimenting with closer to real-time activation and competitive pricing. This reiterated our commitment to continuing to evolve and improve the service as an enduring tool in the British energy sector and an important step towards establishing an active role for homes and businesses in helping our net zero grid to operate.





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