Transforming the future of UK energy and lowering energy-balancing fees with Machine Learning

Elastacloud led a Data Science project with Drax, the largest renewable power generator in the UK, to create and productionise a Machine Learning model which predicts the National Grid's BSUoS charge.

Elastacloud built the Energy BSUoS Forecast Service, an AI-powered web service that helps energy providers reduce incurring energy-balancing fees imposed by national energy authorities.

Balancing Services Use of System Charge (BSUoS) is a charge applied to every MWh which flows from a generator or to a supplier of electricity on the Transmission System. It arises from the cost incurred by the System Operator in balancing supply and demand and purchasing system services such as reserve, frequency control, voltage management etc.

Volatility in the price is driven by a number of factors but weather is becoming the most important influence. It is difficult to forecast with any accuracy, even the System Operator who manages the costs struggles and the growth of intermittent generation is likely to increase that volatility. If Drax generates around 18TWh, its annual BSUoS charge will be £54m, so any saving is significant.

The solution: The BSUoS Forecast

The BSUoS Forecast Service was built using Microsoft Azure Machine Learning services. Our Data Scientists used historical BSUoS, demand, and generation data to build the machine learning model for the forecast that generates automated reports for the user. These reports provide a prediction of the BSUoS charge for the customer with significantly greater accuracy than other industry standard models.

The service enables energy companies to reduce costs by avoiding generation during the high price periods, and a reduced error risk. The proficiency and accuracy of the model not only provides advanced, industry-leading predictive reports, but makes it understandable and intuitive. As for the wider energy sector, the Forecast is a market-leading data science service, allowing generation companies to more profitably diversify their energy mix through improved optimisation of their own generation profile.

"The business outcomes from the solution Elastacloud provided us with are twofold, firstly we can now reduce costs by not generating in the high price periods, and secondly, we now have pricing advantage over our competitors due to the reduced error risk. We are now better positioned to manage this volatility and optimise the generation portfolio."

Alex Nancolas, IT Programme Manager at Drax Power