



Sleipner. Source: Kjetil Alsvik/Statoil

Serving the UK's Biggest Energy Provider

As the largest supplier of energy to the United Kingdom with over 10 million customers, Centrica's demand forecasting needs are complex and wide ranging. The variety and magnitude of the company's customer base represents a welcome challenge to TESLA and its demand models.

About Centrica

Centrica is a multi-national utility company, that supplies electricity and gas to businesses and consumers in the UK and North America. Operating under the name British Gas in the UK, they are one of the "Big Six" energy providers and since being founded in 1997 have had the largest market share by customer in the industry.

TESLA's Involvement

TESLA has been meeting the demand forecasting needs of the Centrica team for over a decade. The forecasts provided to Centrica are split by geographic area and customer type, a large suite of 112 models which can then be aggregated to a country wide level. This method of forecasting leads to much higher accuracy, as the individual fluctuations found in different parts of the country as well as the differing responses to weather changes by customer type are picked up by the models. It also allows TESLA to use a much larger dataset of weather stations to comprehensively capture weather effects across the country.

Centrica makes planning decisions on a daily basis, relying on the TESLA models to perform intra-day balancing of load demand and supply, conduct commodity hedging and monitor changes in consumption

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Jason Blackmore

Forecasting and Modelling Manager
British Gas, Centrica

patterns. In order to allow Centrica to perform these tasks quickly and efficiently an onsite installation of the system was delivered. This not only allows them to produce forecasts on demand but also enables them to manipulate weather inputs to obtain load forecasts from different scenarios.

Daily load and weather updates feed back to TESLA via FTP allowing constant updates to the forecasting model history. TESLA econometricians carry out regular recalibration of the model suite to adjust to the latest trends in load and weather data.

Additionally, TESLA provide Centrica with a single model that forecasts a UK national demand series known as INDO. Centrica use the forecast of INDO to assist them with identifying Triads. These are the three highest half-hourly periods of system demand in the winter months, typically around 5-6pm when industrial demand coincides with the domestic tea-time period. By using the TESLA forecast of INDO, Centrica has prior warning of a potential triad period and can work to avoid the very high additional costs that are charged for usage at these peaks.

Further Developments

The suite of 112 models split by GSP has served Centrica well over the past decade, but with better performance and accuracy in mind a further split by business and residential customers is being developed. This will look to differentiate the distinct characteristics between the customers, allowing the models to better adapt to the profile of each and subsequently improve accuracy.

With the UK INDO model steps have been taken to capture the growing effect of embedded wind and solar generation in the UK. By definition this load is not metered so TESLA created a method of estimating total embedded generation. This complex algorithm resulted in a more accurate and reliable forecast. In the period this model was live, model error reduced by 0.4%.

These developments stem from TESLA's constant endeavour for better accuracy as well as an eagerness to be active in the market, allowing companies such as Centrica to quickly understand moving trends and identify changes in the industry.

Benefits

- **Key information** to make commodity hedging decisions
- **Lower cost** than dedicating staff to producing load forecasts
- **Minimal overhead** to trial and implement
- **Easy integration** with existing systems

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