National Grid ESO and Smith Institute begin industry-pioneering Dynamic Reserve Setting (DRS) project

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- **Network Innovation Allowance (NIA)-funded project to explore moving to dynamic day-ahead reserve setting**
- **Machine learning algorithms will be developed to more accurately predict reserve requirements**
- **Project could improve efficiency of system operation and value for consumers**

National Grid Electricity System Operator (ESO) and the Smith Institute are collaborating on a new project to develop an innovative approach to forecasting day-ahead reserve requirements.

Through the Dynamic Reserve Setting (DRS) project ESO aims to adopt a new, fully dynamic day-ahead approach to scheduling reserve – the back-up power it keeps in readiness in case it's needed – to boost the efficiency of balancing actions and improve value for consumers.

Currently ESO sets reserve levels that vary according to electricity demand seen at different times of the day and week – with levels informed by historical generation and forecasting errors, and adjusted by forecast renewable generation output.

These reserve levels could potentially be optimised to take better account of the effect on the system of forecast weather conditions, by linking generation and forecasting errors to weather driven effects or other variables, and buying reserve in day-ahead timescales.

The Smith Institute were chosen as partners by ESO to develop a proof-of-concept Machine Learning model which will use predictor variables, such as temperature and wind forecast data, to create more accurate predictions of forecast errors to account for the variability in weather day-to-day.

The model will help ESO better understand where there are uncertainties in its forecasting data, and set reserve levels more accurately – potentially limiting the need to keep fossil fuel plants running as back-up, reducing emissions and saving costs.

The work marks a key step in supporting ESO's wider ambition to be able to operate the electricity system with zero carbon by 2025.

Rachael Warrington, Executive Mathematical Consultant at the Smith Institute said:

> "I'm really excited to be part of creating a new approach that could make a big difference in the energy industry. The way it could help ESO move towards carbon net-zero is also a real motivation."

Isabelle Haigh, head of national control for National Grid ESO, said:

> “As more clean energy connects to Britain’s electricity system, the network is becoming more challenging to operate. The more confidence and certainty we have in our forecasts, the more efficiently and securely we’ll be able to balance the country’s supply and demand day to day, minute by minute.
>
> “Innovative developments like this are crucial if we’re to realise our zero carbon ambition. Collaboration is key and we look forward to working with the Smith Institute to develop our processes.”

The project – part of ESO’s innovation portfolio – is funded by Ofgem’s NIA, which provides an annual allowance to fund innovation projects that create value for consumers.

If the initial proof-of-concept proves successful, the algorithm will be integrated into ESO’s systems for a live trial.

The project is set to last for approximately twelve months, with the initial proof-of-concept expected in November 2021.

ENDS

Notes to editors

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