

# Forecasting Stakeholder Working Group

1<sup>st</sup> Nov 2023

# Agenda

- Introductions
- Purpose of Forecasting Stakeholder Group
- ESO's Forecasting Roadmap Update
- ESO's Forecasting Improvements
- Open Forum / Q&A

# Forecasting Stakeholder Working Group

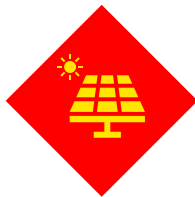
The purpose of this forum is to establish a working group focused on improving the transparency and accessibility of energy forecasting data, increasing the accuracy of energy forecasts, and exploring innovative methods of forecasting through the use of new data and modelling techniques.

The group will collaborate with industry stakeholders to align ESO's forecasting enhancements with their expectations, and continuously engage with them to develop plans that are ambitious and feasible

## Objectives

- Improve the transparency and accessibility of energy forecasting data
- Improve the accuracy of Energy forecasts (Demand & Generation)
- Explore innovative methods of forecasting using new data and modelling techniques.
- Collaborate with stakeholders to align forecasting enhancements with their expectations

# Forecasting Products & Roadmap



Solar Power Generation



Wind Power Generation

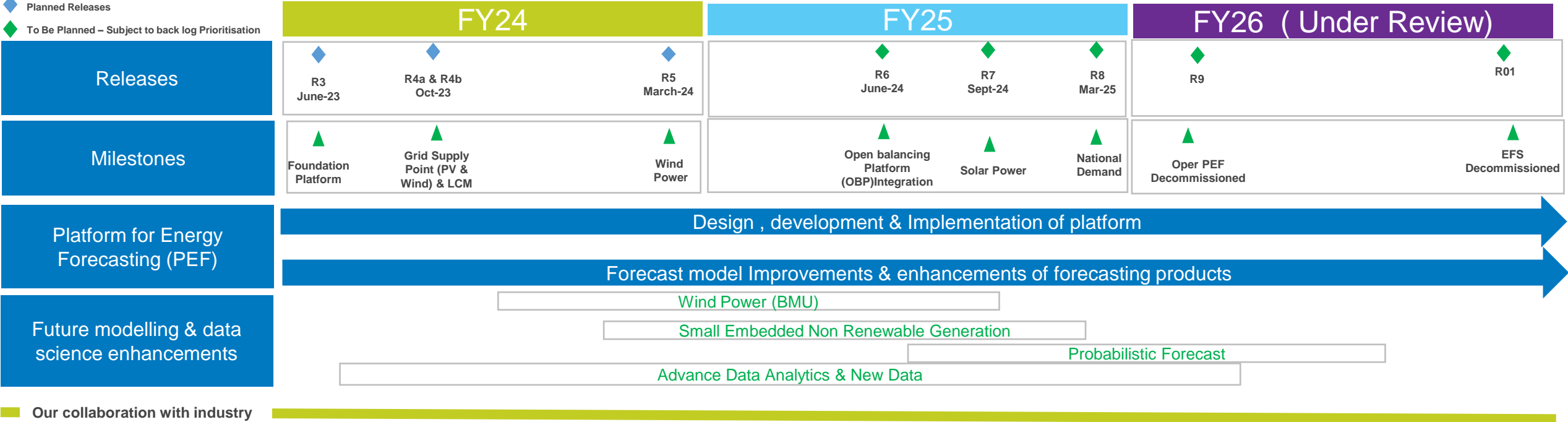


National Demand



Grid Supply Point (GSP)

◆ Planned Releases  
◆ To Be Planned – Subject to back log Prioritisation



Join our Forecasting Stakeholder Focus Group



A landscape photograph of a field at sunset. The sun is low on the horizon, casting a warm glow. In the foreground, there are several bright, glowing green lines that curve across the field, suggesting energy or data flow. The field is a mix of green and yellow, indicating it might be a crop field. The sky is a mix of orange, yellow, and blue.

# ESO's Energy Forecasting

# Wind Forecasting Improvements from the Energy Forecasting Team

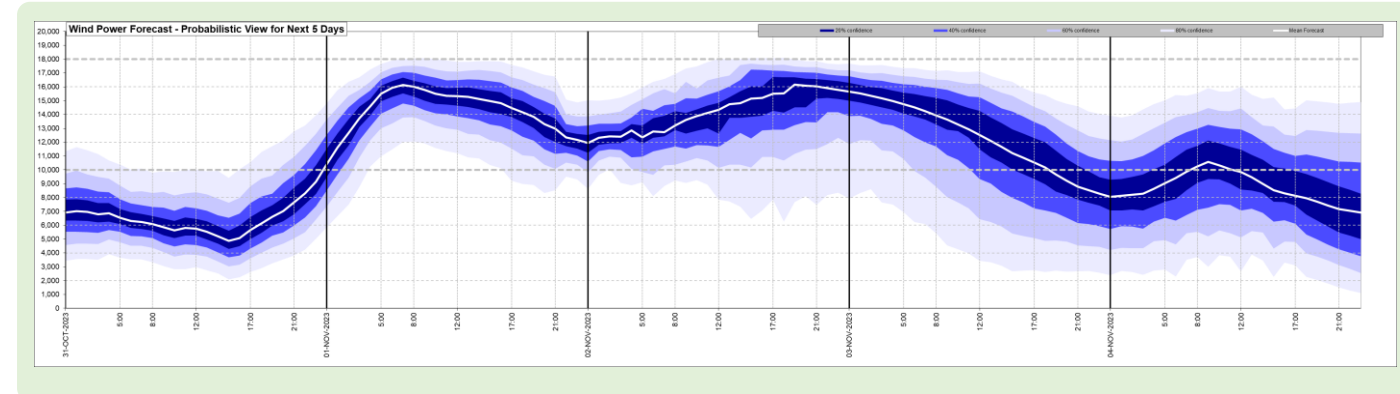
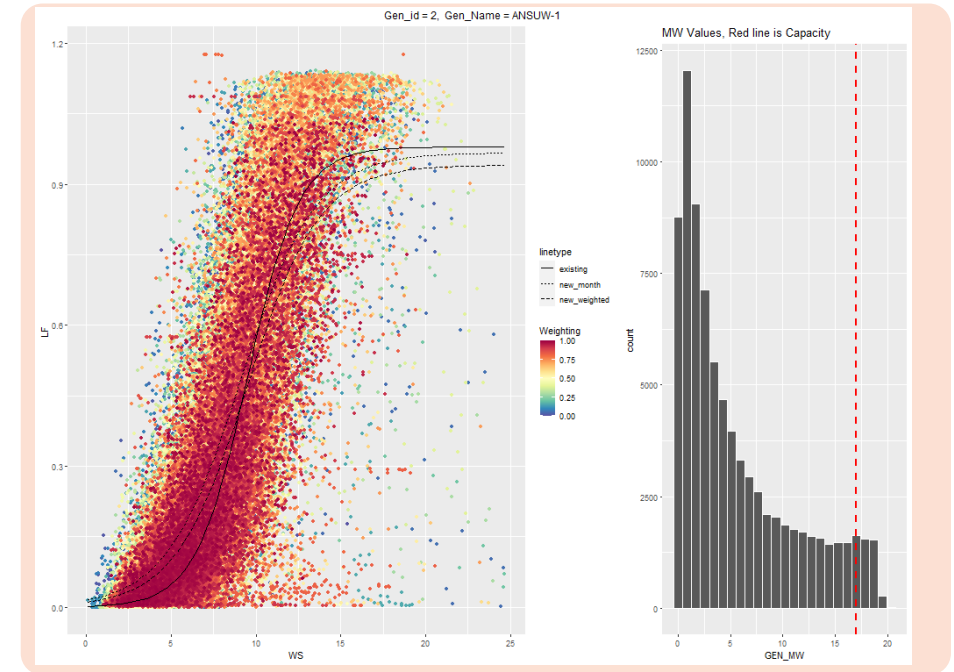
The Energy Forecasting team have been implementing several “quick win” improvements to the wind power forecasts currently delivered by EFS:

- Updated *Operational Capacity* levels for all Wind BMUs (~230)
- Updated training models using most recent operational metering
- Remapped weather stations – to align the windfarm to the closest weather source we currently receive data for
- Re-align systems to correctly record KPIs (Incentives)
- Recruited extra Data Scientists

External publication of Wind BMU forecasts on the *ESO Data Portal* (currently anonymised)


## Next steps

- Improved cut-off (High Speed Shutdown) modelling
- Instigate windfarm-outage modelling
  - Initial observations suggests ESO are receiving poor quality outage data, via eGAMA or REMIT



# Wind BMU Forecasts – ESO Data Portal

## 14 Day Ahead Wind BMU Forecast (Anonymised)

[Download \(CSV\)](#) 

[API](#)

This resource contains the BMU-level 0-14 day ahead wind forecasts for all the windfarms which are used to produce ESO's national 14 day ahead incentive wind forecasts. This is not a complete list of BMU's within ESO systems and excludes license exempt windfarms.

Total rows: 122,431

Date

[Add a filter](#) [Submit](#) [Reset](#) [Query Builder](#)

**Table** [Chart](#)

Datetime	Date	Settlement_period	GEN_NAME	CAPACITY
2023-10-31T14:30:00	2023-10-31	30	WINDFARM_1	70
2023-10-31T14:30:00	2023-10-31	30	WINDFARM_2	397



Note: *Capacity* is the Operational Capacity, which is a deterministic and dynamic value; calculated from recent operational metering telemetry

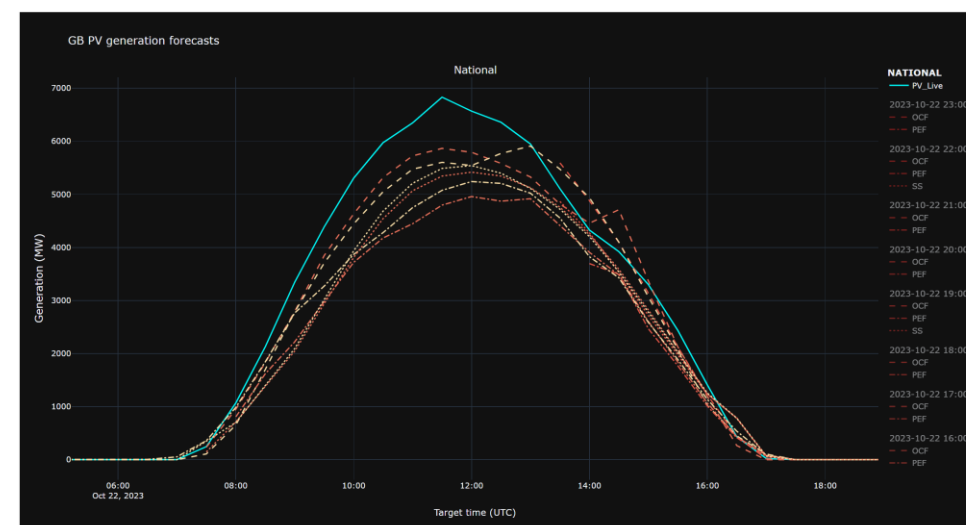
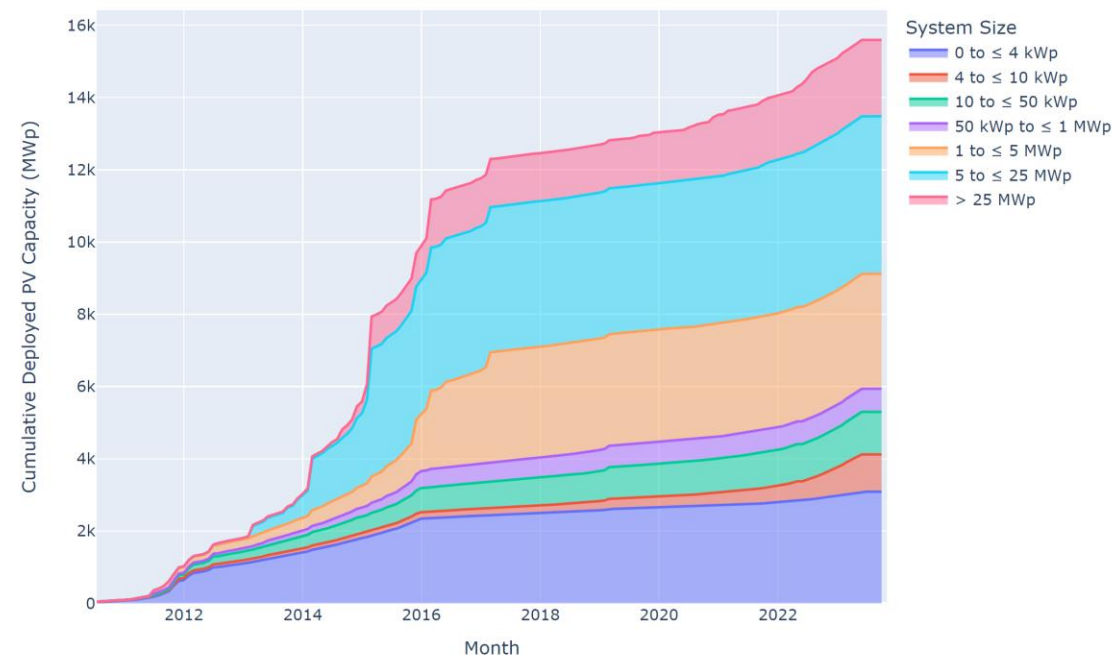
# Solar Forecasting Improvements

## Recent wins in the energy forecasting team

- More frequent PV capacity updates (~quarterly)
  - Capacity update process has been streamlined
- A new dashboard tool to download and visualise PV forecasts from various sources, operationally and post-event
  - Python modules to interface with APIs
  - Currently supports PEF, OCF, Sheffield Solar

## Next steps

- Incorporate latest NWP data (including ensembles)
- Refine modelling approach
  - Support for arbitrary aggregation entities (GSP, Gnode etc) to improve compatibility with other ESO systems
  - Support for forecasting individual solar BMUs
- Standardised forecast engine
  - Same engine for wind and solar forecasting
  - Improves product stability and sustainability
  - Paves the way for forecasting other technologies in a similar way (e.g. embedded non-renewables)





# Numerical Weather Prediction (NWP) Data

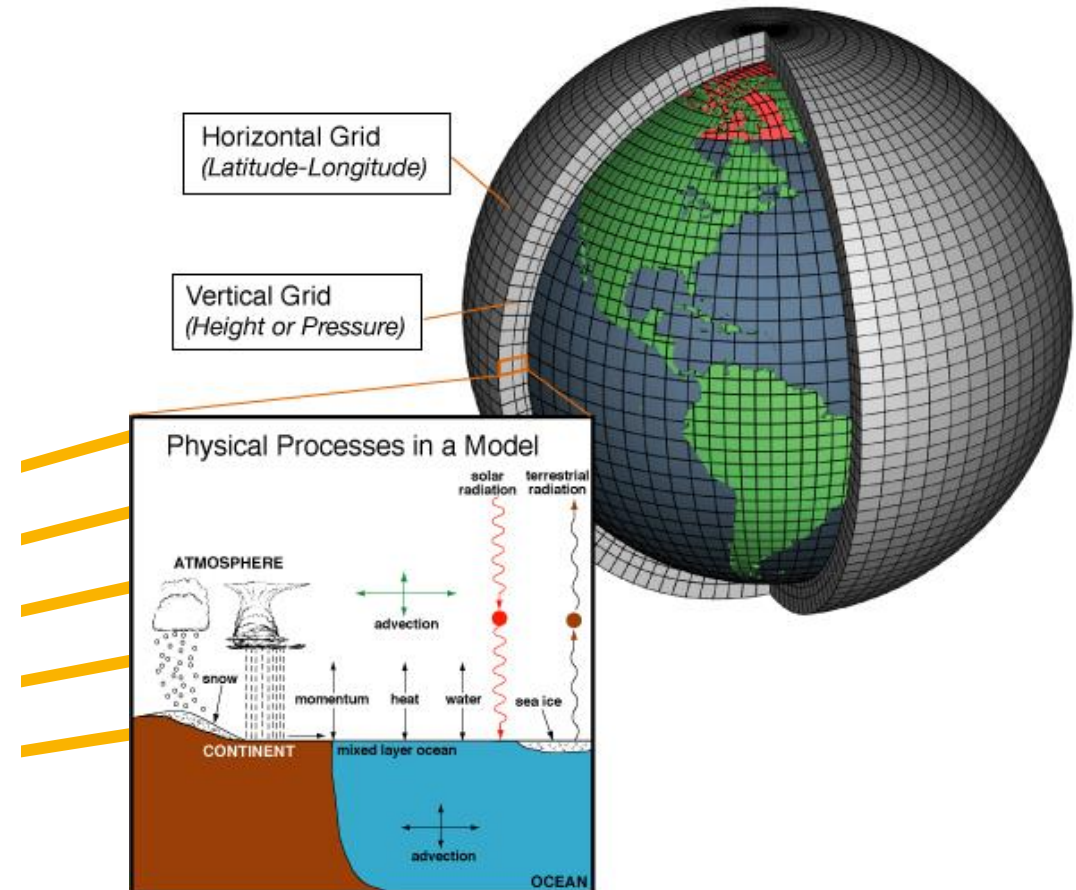
Currently, ESO receive custom weather forecasts:

- at approx. **260** GB locations, including large population centres, clusters of solar capacity, and large wind farms
- updated 8 times per day – can take up to 2hrs to process

However, even these locations represents only a tiny sample of the underlying NWP data available

Modern NWP based forecasts provide:

- A spatial grid covering approximately **300,000** surface locations over the UK
- Dozens of possible weather scenarios, from different underlying NWP models and configurations
- Updated hourly



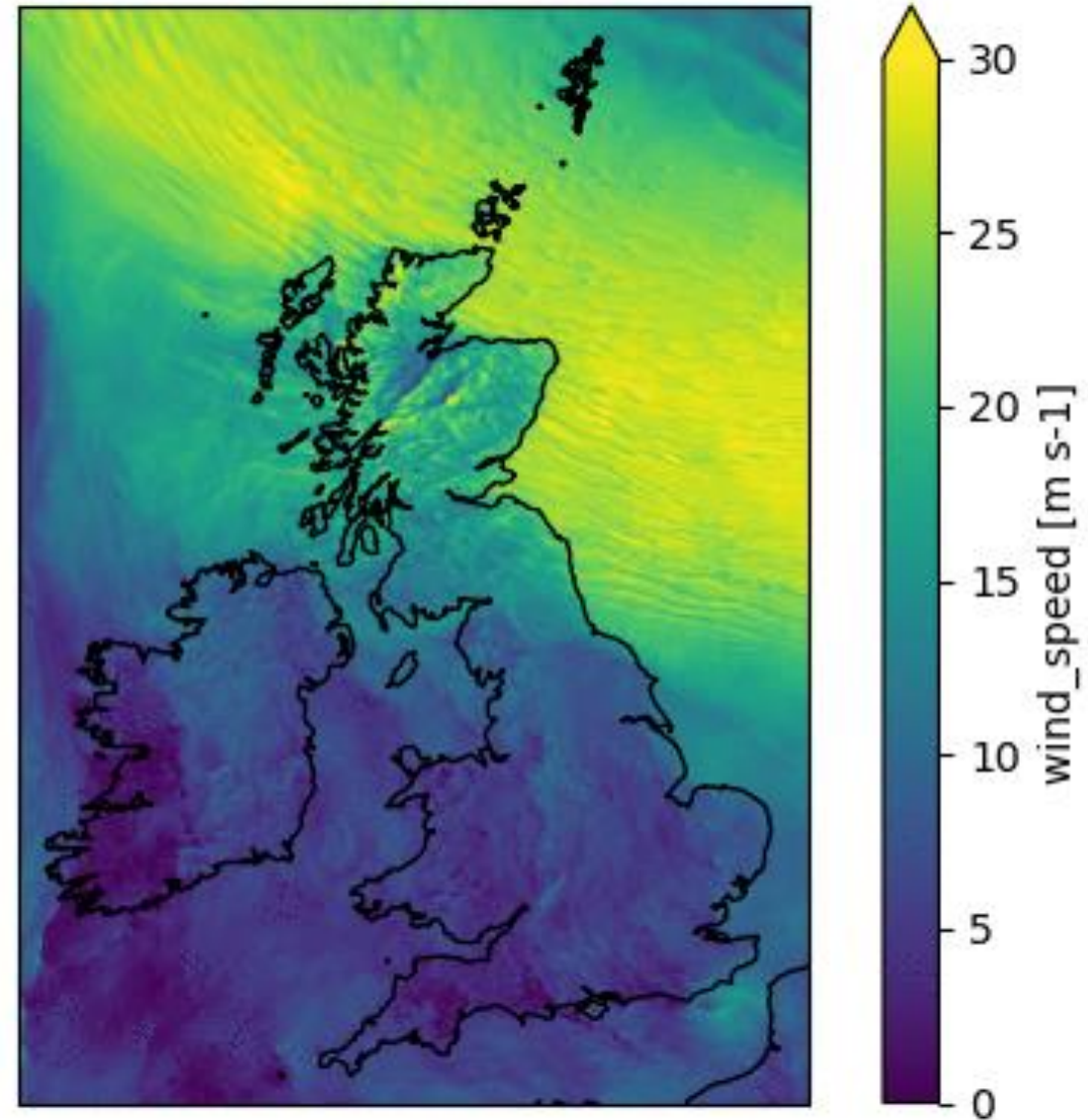
Note: Existing ESO systems cannot use Numerical Weather Prediction (NWP) data – expected implementation from Apr-24. But will explore tactical weather-mapping options in the meantime

# A New Generation of Energy Forecasting Models

Starting with our wind power forecasts, we are rebuilding our energy forecasting models to make full use of modern NWP datasets

The models will be built using the new platform for energy forecasting. This will:

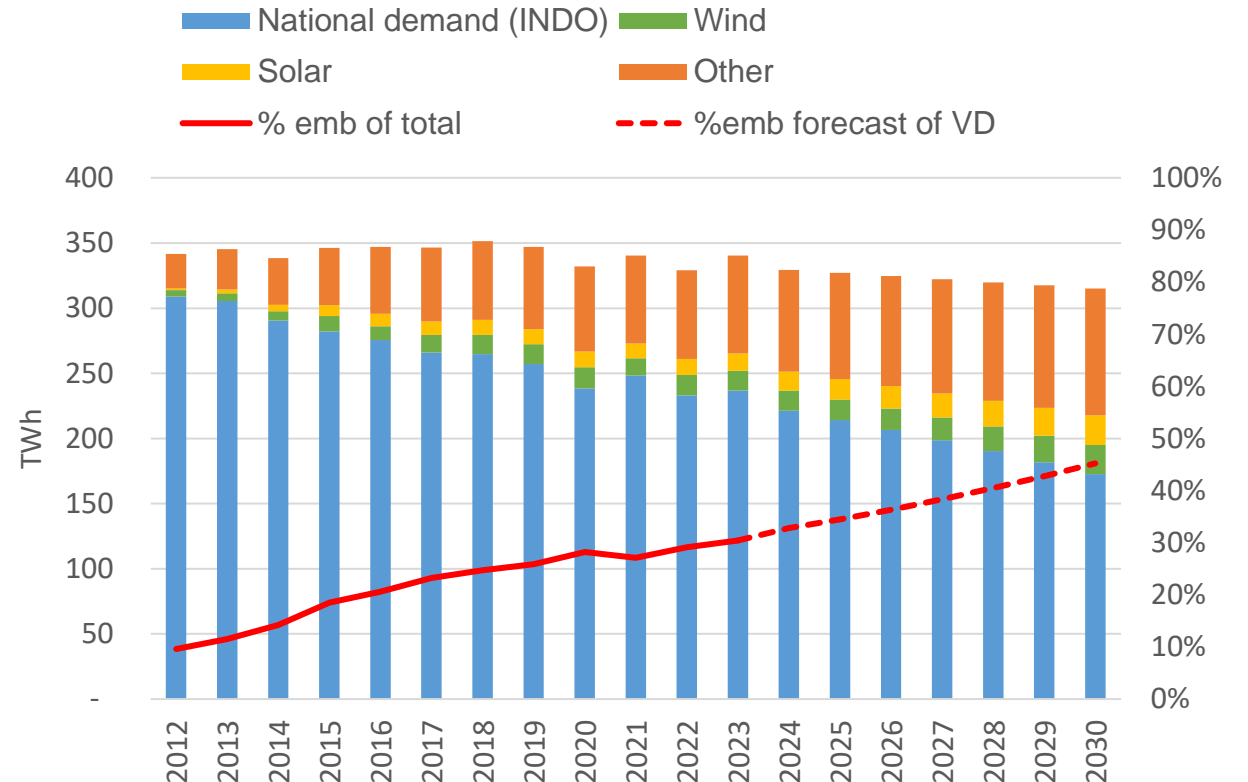
- Provide a more scalable cloud-based IT infrastructure
- Enable more advanced statistical and machine learning methods to be adopted



# Demand Forecast Improvements

- To improve our demand forecasts we need more data on embedded generation outturn and activity
  - We have noticed significant movements of demand, coincident with Interconnector transfer changes – suggesting embedded generation sources are active.
- In discussions with DNOs, to acquire commercial solar farm outturn data.
- In discussions (POC) with additional *weather* providers and third-party *forecast* providers, to complement our own forecasts
- We are exploring options on how best to model additional fuel-type (e.g. Batteries) generation sources

Growth of embedded gen vs virtual demand



# Open Forum / Q&A

