



# Forecasting Stakeholder Working Group

17<sup>th</sup> May 2023

# Agenda

Content	Presenter
Introduction to Forecasting Stakeholder Working Group <ul style="list-style-type: none"><li>• Purpose of the working group</li><li>• Review Terms of Reference</li></ul>	Sumit Gumber
Forecasting Roadmap – Overview	Sumit Gumber
Forecasting Problem – National Demand (Re-Cap)	Owen Huxley
Forecasting Improvements	Ryan Carson
Q&A / Open Forum	Sumit Gumber /All
Agenda Items for Next meeting	

# 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

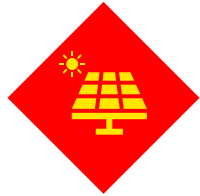
# Stakeholder Collaboration & Engagement Process

- Learn from stakeholders' experiences and understand their current pain points in forecasting
- Plan and implement improvements for the future of forecasting in line with the balancing programmes forecasting roadmap and the evolve initiative
- Engage with stakeholders bi-monthly\* on an ongoing basis, both remotely and in person.
- Encourage stakeholder input to ensure plans are ambitious, achievable, and in alignment with industry priorities

## Logistics & Deliverables

- The working group will operate as an open forum, allowing for new attendees to join at any point during the process.
- Sign-up details will be available through MS Forms, with the information shared on the website and via email.
- Meeting details, as well as any changes, will be communicated through email and posted on the website.
- The outcome of each working group meeting, from the first meeting onwards, will be shared, along with related questions and answers, on the ESO website
- A continuous review of forecasting strategy , current energy forecasting data, focused on the aspects of transparency and accessibility
- Actionable recommendations to improve the overall accuracy of energy forecasts
- Exploration and evaluation of innovative methods and data-driven modelling techniques for forecasting
- A roadmap detailing plans for implementing improvements with input from industry stakeholders

# Forecasting Product Roadmap



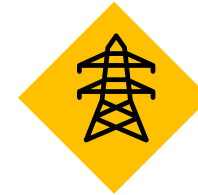
Solar Power Generation



Wind Power Generation



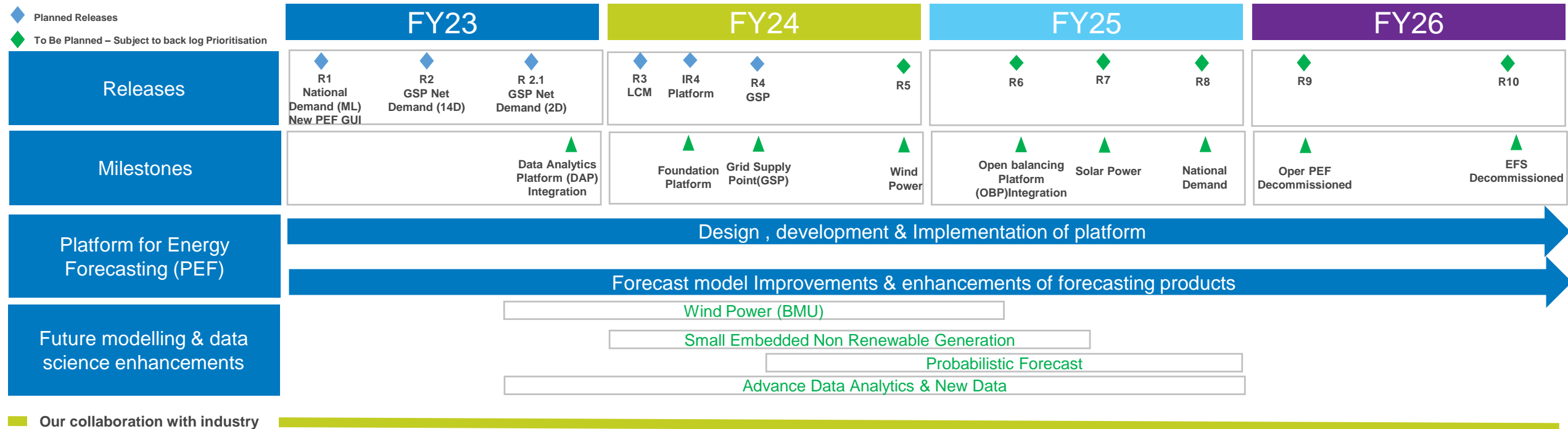
National Demand



Grid Supply Point (GSP)



Real Time Predictions (New)



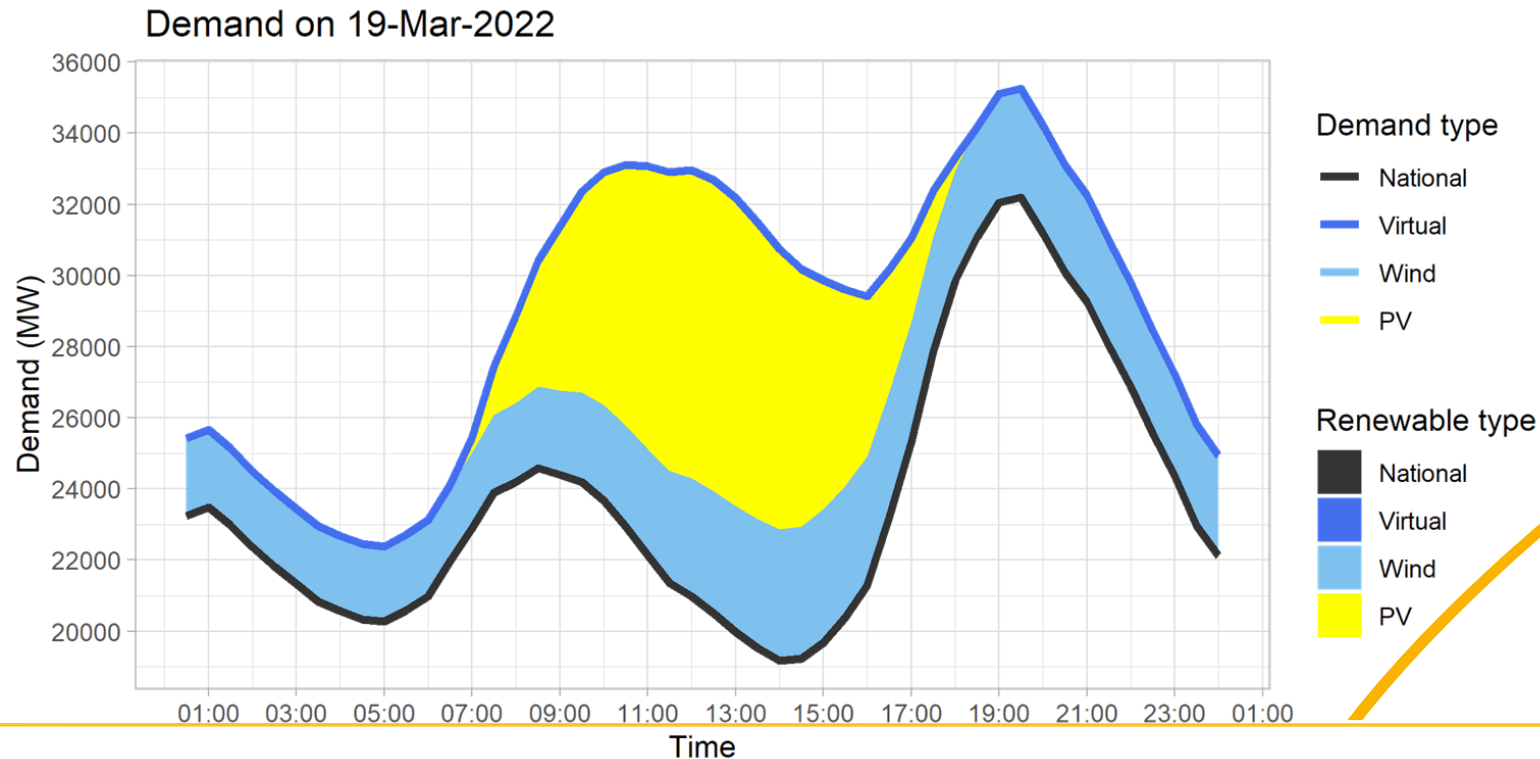
Join our Forecasting Stakeholder Focus Group

A landscape photograph of a field at sunset. The sun is low on the horizon, casting a warm glow. The field is green and yellow, with some dark trees in the background. Several bright green, glowing light trails curve across the middle of the image, suggesting movement or data flow. The overall mood is serene and futuristic.

# Forecasting Problem – Re-Cap

# How we forecast

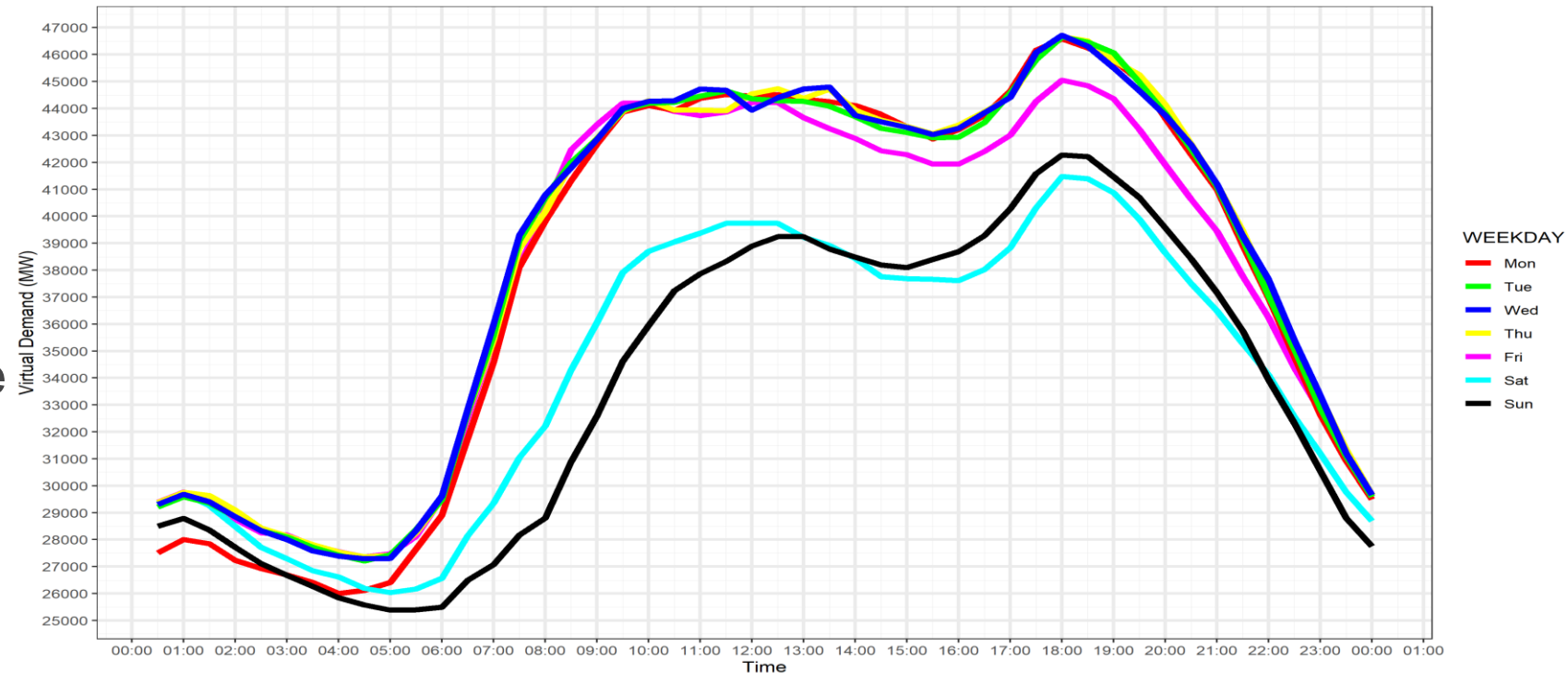
- Day ahead forecast at 9am
- As agreed with Ofgem and industry the ESO forecasts Initial National Demand Outturn (INDO)
- To do this, we forecast 'virtual' demand and subtract embedded wind/solar estimates
- Where virtual demand is the total underlying customer demand
- Permitted inputs: weather data, historical demand and time variables





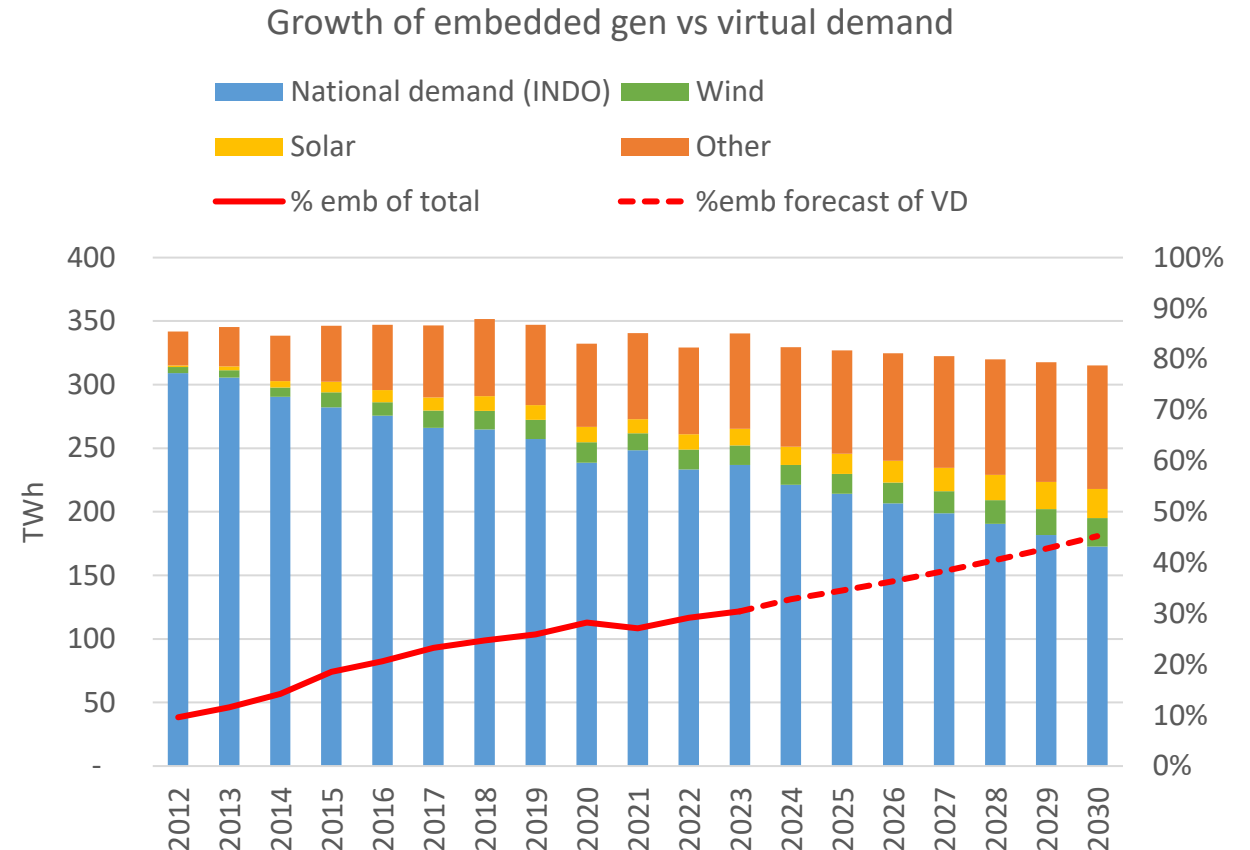
# Why do we forecast virtual demand?

- Virtual demand is relatively “predictable”
- Forecasting virtual demand and subtracting embedded generation forecasts has provided the most accurate forecasts for national demand
- Interpretable results
- Unified approach for all time-horizons



# Visibility of embedded generation

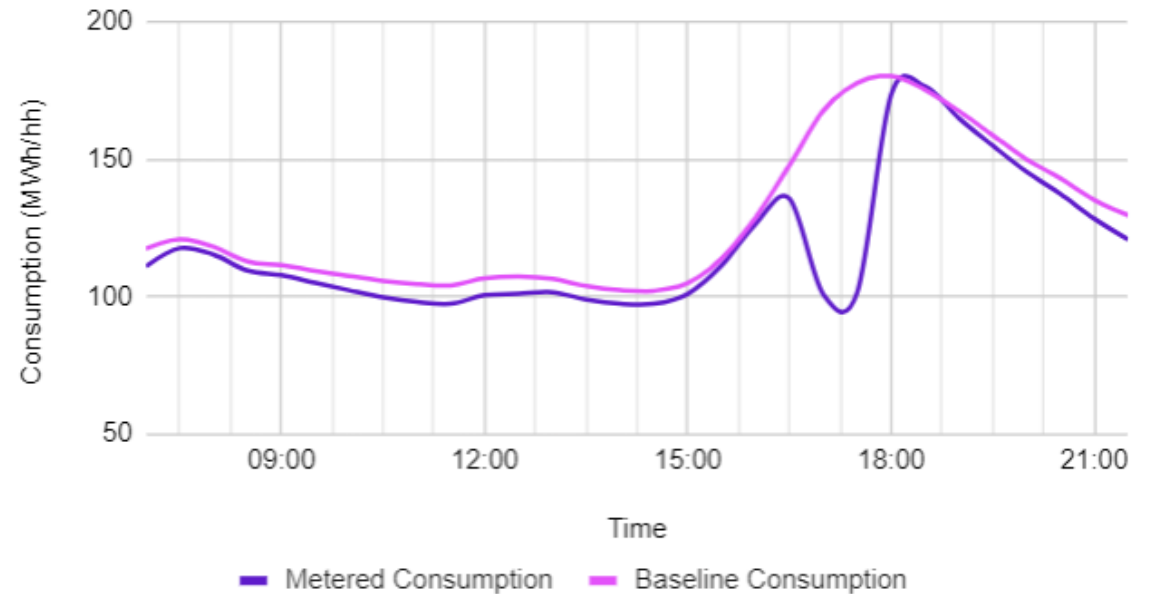
- To improve our virtual and national demand forecasts we need more data on embedded generation
- For day-ahead forecasting we need historic data on embedded generators (especially non-wind/solar)
- For real-time forecasting we need near real-time metering of embedded generators
- We also need to keep track of assets as they partake in ancillary services (e.g. response, reserve, and Local Constraint Market (LCM))
  - Minimise “double counting” of embedded assets in ancillary service markets
  - E.g. a solar farm selling reserve in the quick reserve market



# Forecasting time of use tariffs and demand flexibility

- Virtual demand profile is becoming less predictable
- We must develop a forecasting system which helps us manage demand flex
- We think we need to migrate to probabilistic forecasting

Saving Sessions Event - 23 January, 17:00-18:00



Source: from Twitter @DrSimEvans @OctopusEnergy

# Forecasting Improvements



# Wind forecasting improvements from the Energy Forecasting Team

The Energy Forecasting team is working on several “quick win” improvements we can make to the wind power forecasts currently delivered by EFS:

- Explore training models using settlement data rather than operational metering (or both)
- Improved weather NWP inputs (e.g., more locations, ensembles)
- Improve short-term (0 - 6hr) forecasts with auto-regressive techniques and improved model blending
- Build a new lightweight framework for rapid agile testing of novel wind power forecasting techniques in a PEF pre-production environment

Wind forecasting experiments currently in progress:

- Dynamically adjusted operational capacity estimates for wind BMUs
- (S)ARIMAX for short term forecasting



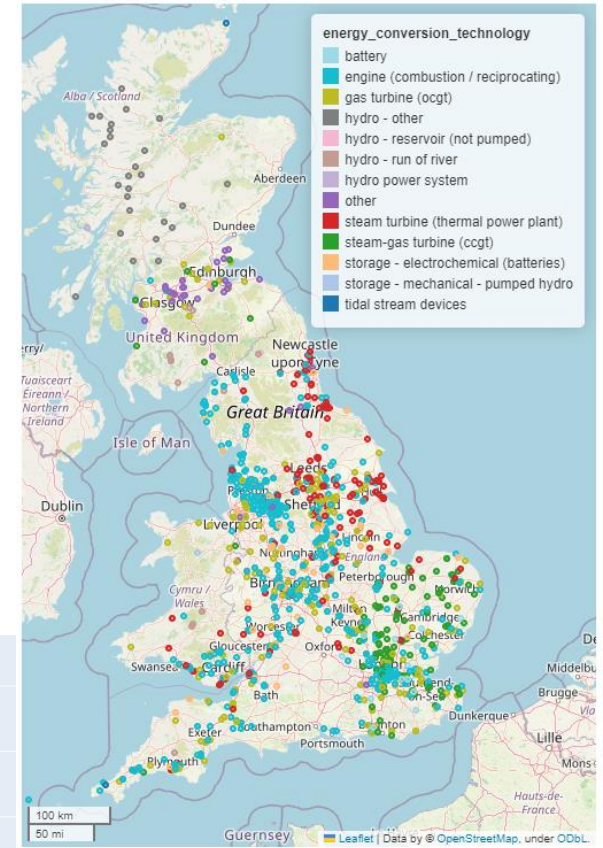
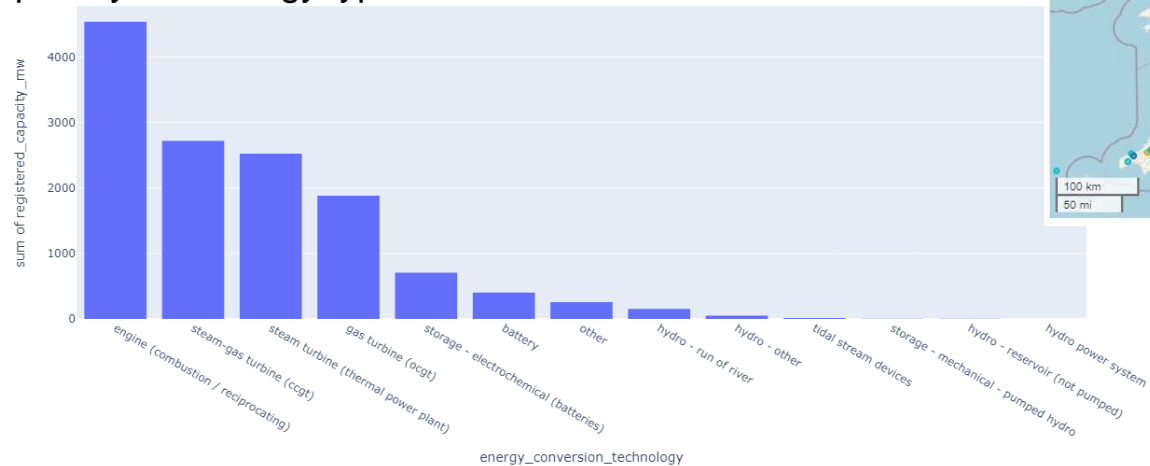
# Steps towards modelling non-renewable embedded generation

Non-renewable embedded generators (e.g. CHP, diesel, batteries) pose a challenge for demand forecasters because they:

- appear as an invisible reduction in national demand
- are not trivial to model using proxies (e.g. weather observations, sample data)
- are not well tracked in terms of deployment

Work is underway in the Energy Forecasting team to:

- Extract historical generation/export data for embedded non-renewable generators using ElectraLink data
- Match the time series data to system metadata in the Embedded Capacity Registers (ECRs)
- Carry out exploratory analysis of the historical behaviour of these generators and identify explanatory features
- Publish a dataset of historical generation/export by technology type to enable external research
- Develop model(s) to forecast operationally



# Open Forum / Q&A



# Questions From last Balancing Quarterly event

How do you think we should we forecast national demand in future?

How do we ensure that Time of Use forecasts are coherent across different suppliers and aggregators?

Can you share data that will help us forecast demand flexibility?



# Questions From last Balancing Quarterly event

What data on embedded generation and demand can you share us with?

Could you share historical generation and demand data aggregated by Grid Supply Point and by asset type?