Artificial Forecasting

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The Challenge

- Distribution networks are evolving rapidly.

- We are expanding our options for network management and our capabilities as system operators - Flexibility is a key solution.

- We currently tender for flexibility services 6-12 months ahead. Volumes and dispatch windows are identified at candidate sites in a data-intensive exercise.

- Most service providers optimise their flexibility capabilities, the day, week or month ahead, this leaves much of the flex capacity idle, limiting market liquidity and optionality for DSOs.

- Established annual load forecasting methods are not sufficiently granular or scalable to enable procurement on these timescales. We need solutions that can keep pace with the rate of change, and the increasing complexity of load and generation connected to the network.

- Operational load forecasting is needed to determine flexibility service windows and to enable us to provided key information to stakeholders in flexibility service provision.

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The Solution

What is it?

A deployable AI forecasting solution providing operational forecasting capability at scale across primary secondary substations.

Capability

The ability to refine flexibility service dispatch windows (hours, volume), closer to time of dispatch (a day, a week-ahead), increasing deliverability and market liquidity.

Benefits

Evolution of the Flexibility Service Provider (FSP) market and DSO function, deferring reinforcement and enabling wider environmental benefits.

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The Solution

Where Artificial Forecasting fits within Northern Powergrid's processes

Impact

- Improvement to forecasting performance is one outcome from the work to date.

- The improvement in the AI forecast allows us to apply a smaller risk factor to the central forecast.

- This means that the volume of unneeded flexibility is reduced.

■ Actual load
■ Forecast
■ Risk aware forecast
■ Capacity limit
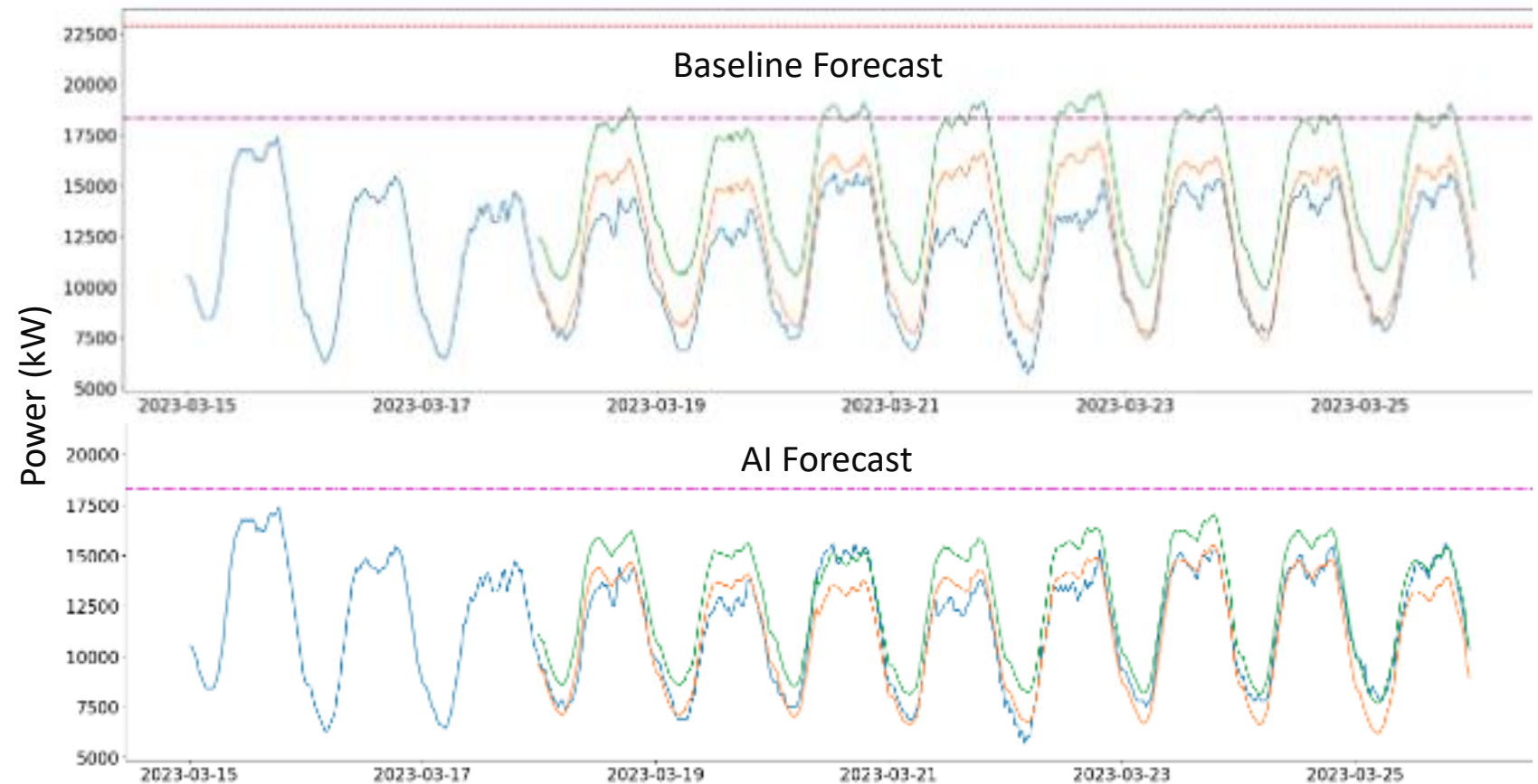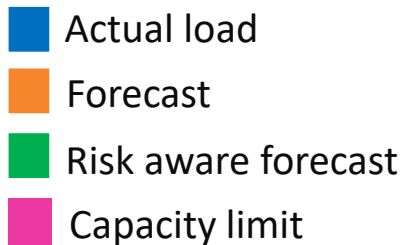
Future

- Completion of the Discovery and Alpha project phases has enabled the project's aims to develop and evolve.
  - Proof of concept using up to five years of historical half-hourly data at 1,215 substations.
  - Partnership with flexibility service providers has built our understanding of the value of sharing the detail of forecasting methods and outputs.

- Next steps
  - Targeted technical refinement building on proof of concept.
  - Transition the operational forecasting capability into business-as-usual system and people development.
  - Make the forecasting parameters, assumptions and results available to flexibility services providers and other relevant stakeholders.

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