Embracing Uncertainty in Operational Forecasting

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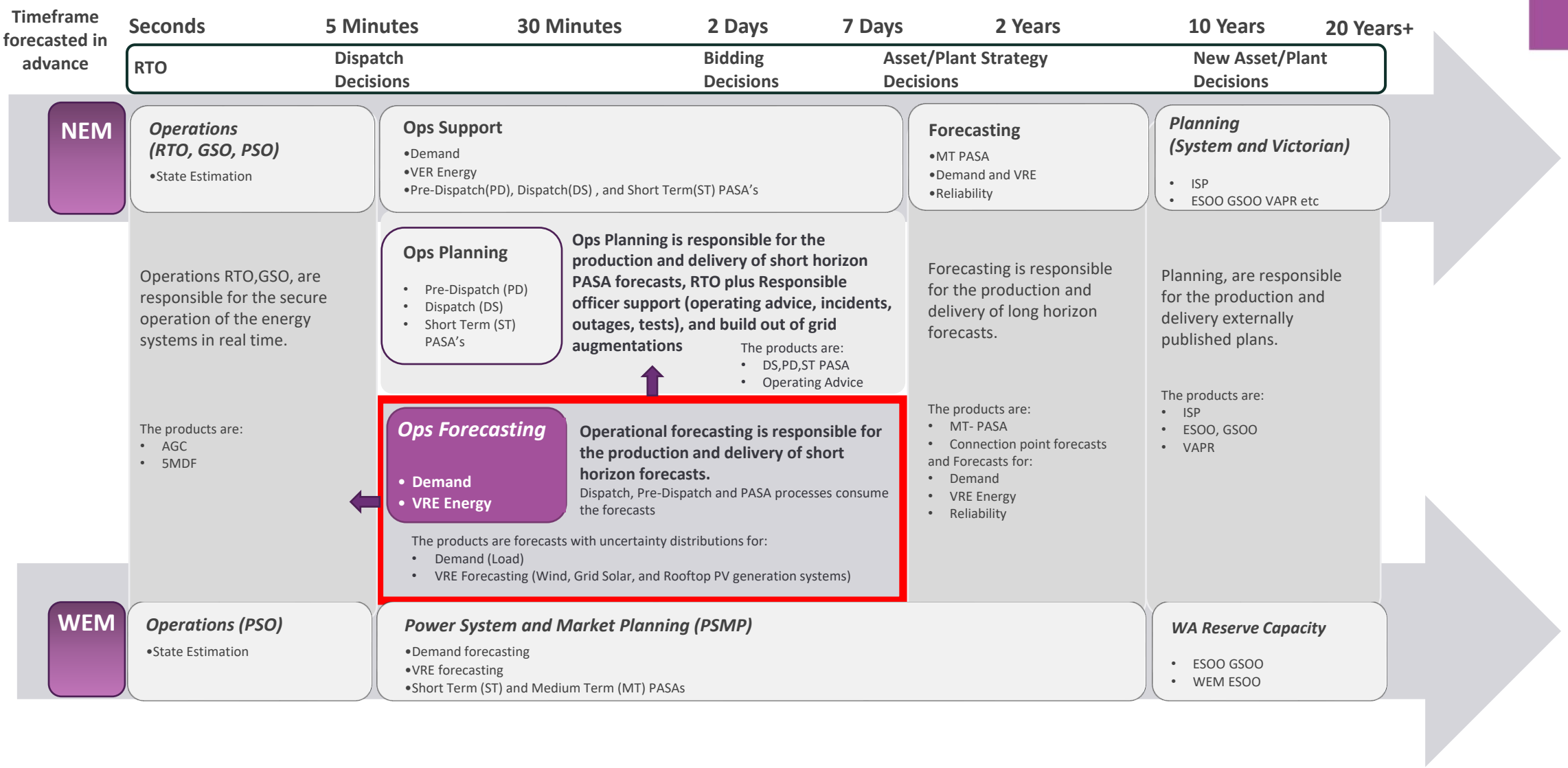
June 2023

Themes & Topics

1. Operational Forecasting at AEMO
2. Evolving Landscape of Operational Forecasting
3. A Probabilistic Approach to Forecasting Uncertainty of Reserves
4. Future of Operational Forecasting

Operational Forecasting at AEMO

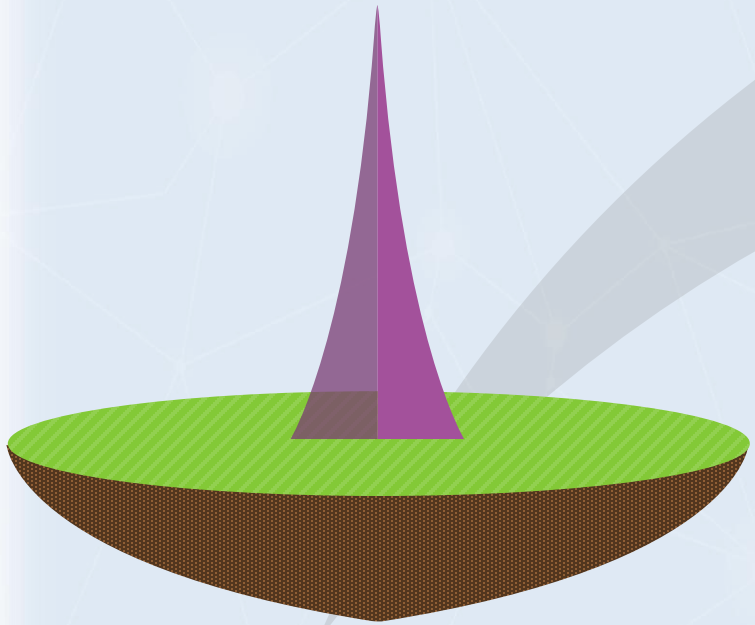
The Role of Operational Forecasting

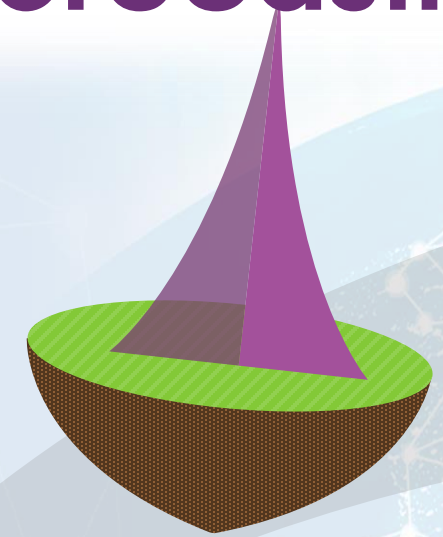


The Evolving Landscape of Operational Forecasting

1998

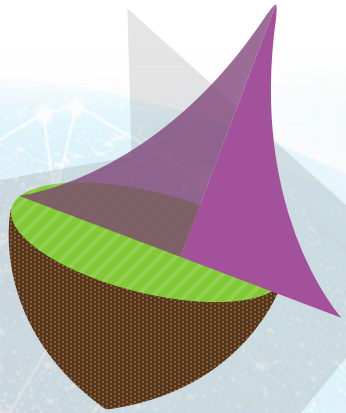
At the start of the NEM the operating envelope for a stable grid state was large compared to the uncertainty of the forecasts used to operate it.





2023

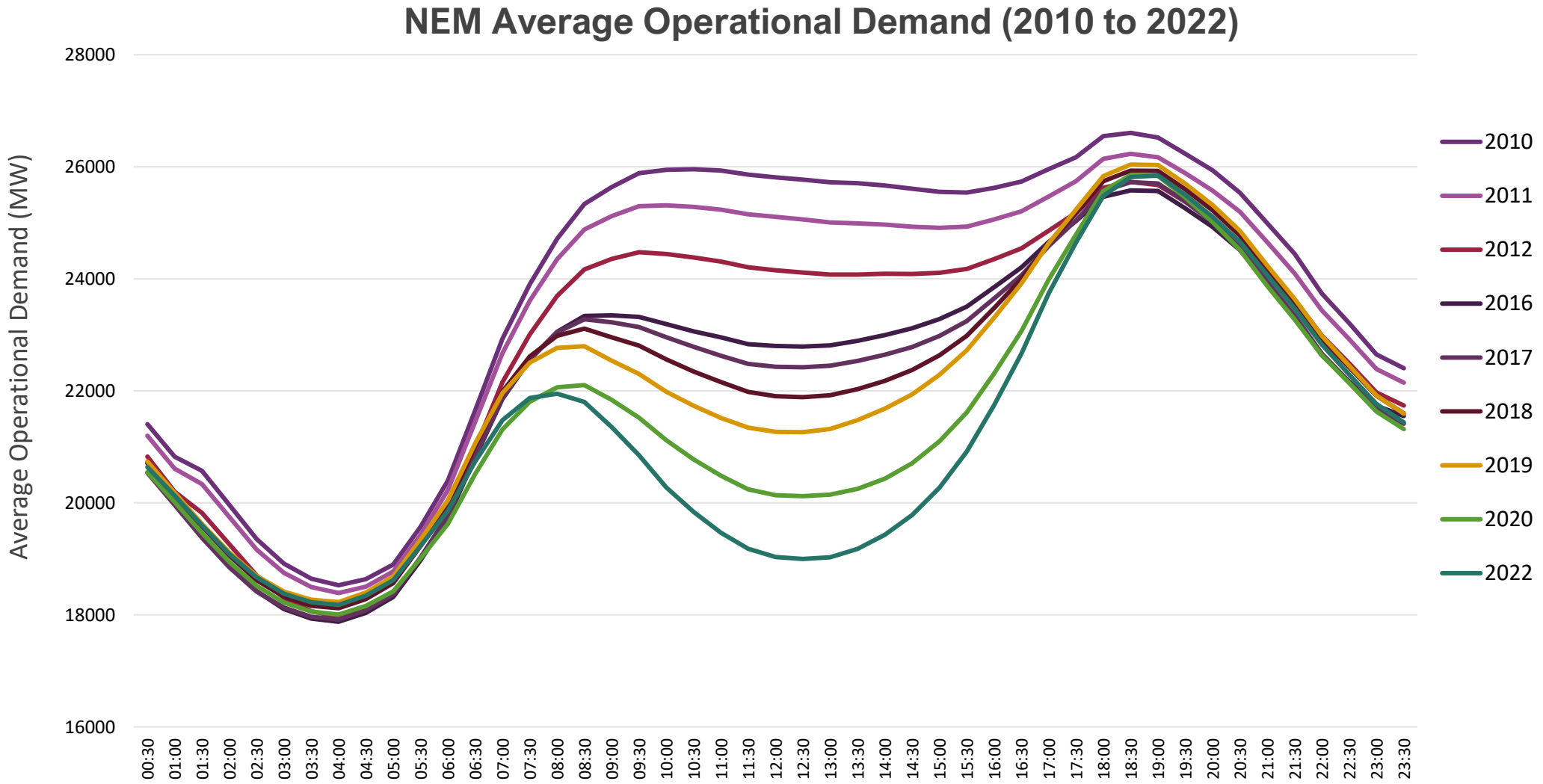
Today the balance between uncertainty and control is becoming challenging



Undesirable Future State

Where the level of uncertainty and variability exceeds the span of control of the system operators.

Evolving Shape of the Demand Profile

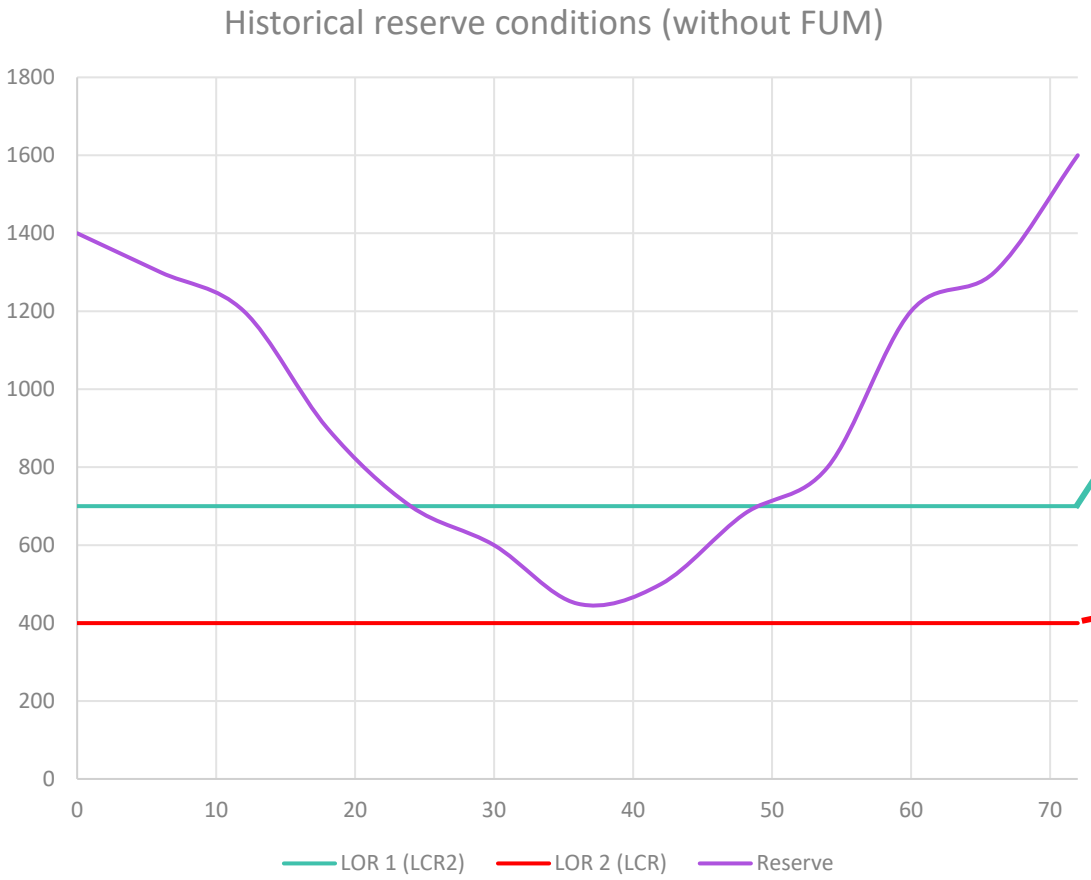


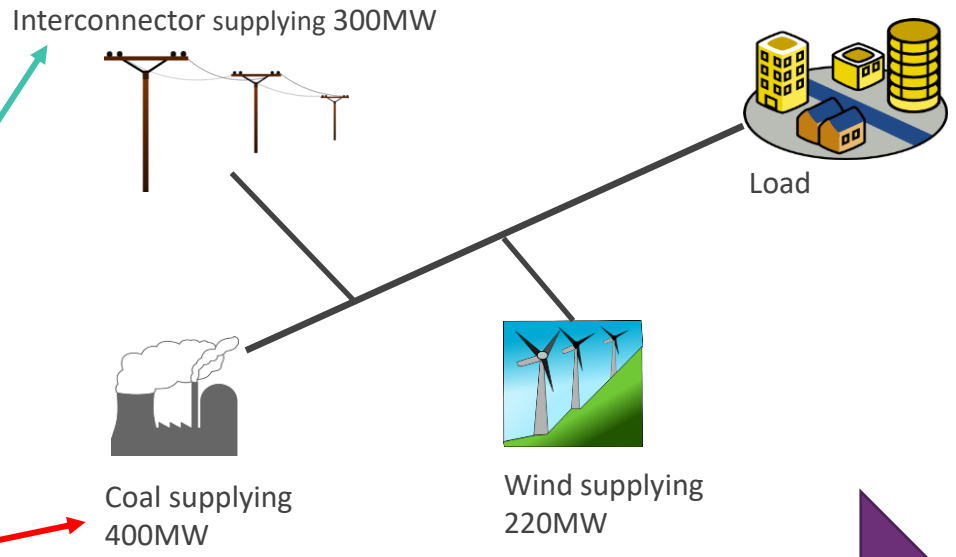
A Probabilistic Approach to Forecasting Uncertainty of Reserves

Where we've been, where we are, and where we are going

Reserve levels in the NEM

Reserve levels were historically set based on the largest supply to the system.



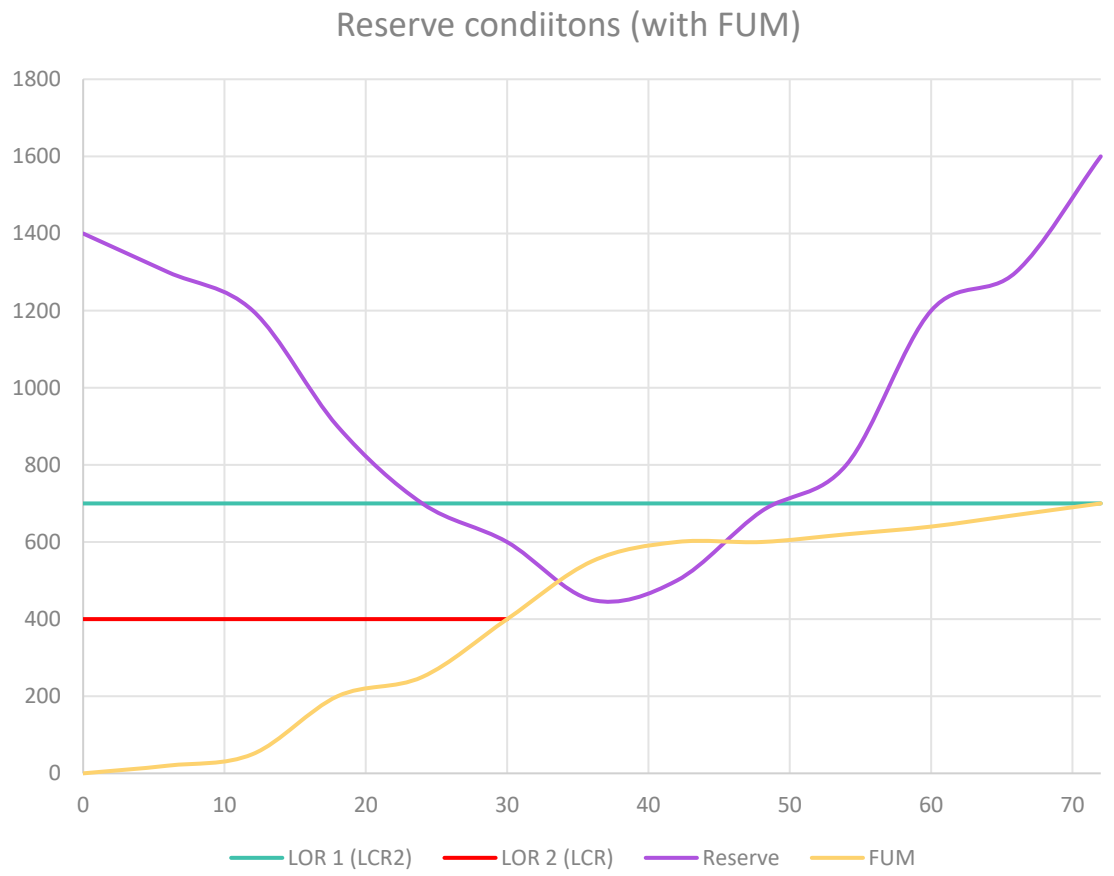


To address dynamically evolving reserves in the NEM, AEMO introduced the FUM

The FUM (Forecast Uncertainty Measure)

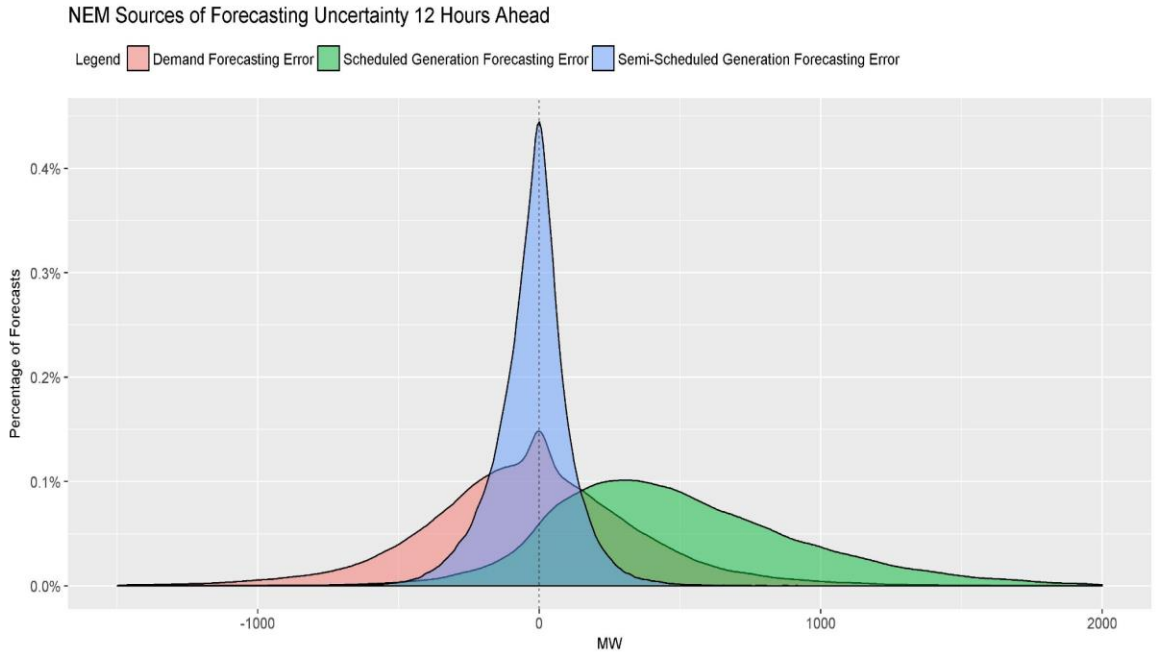
The FUM Model is trained on historical forecasting errors and situational conditions present at time forecast was produced. These can include weather and time of day.

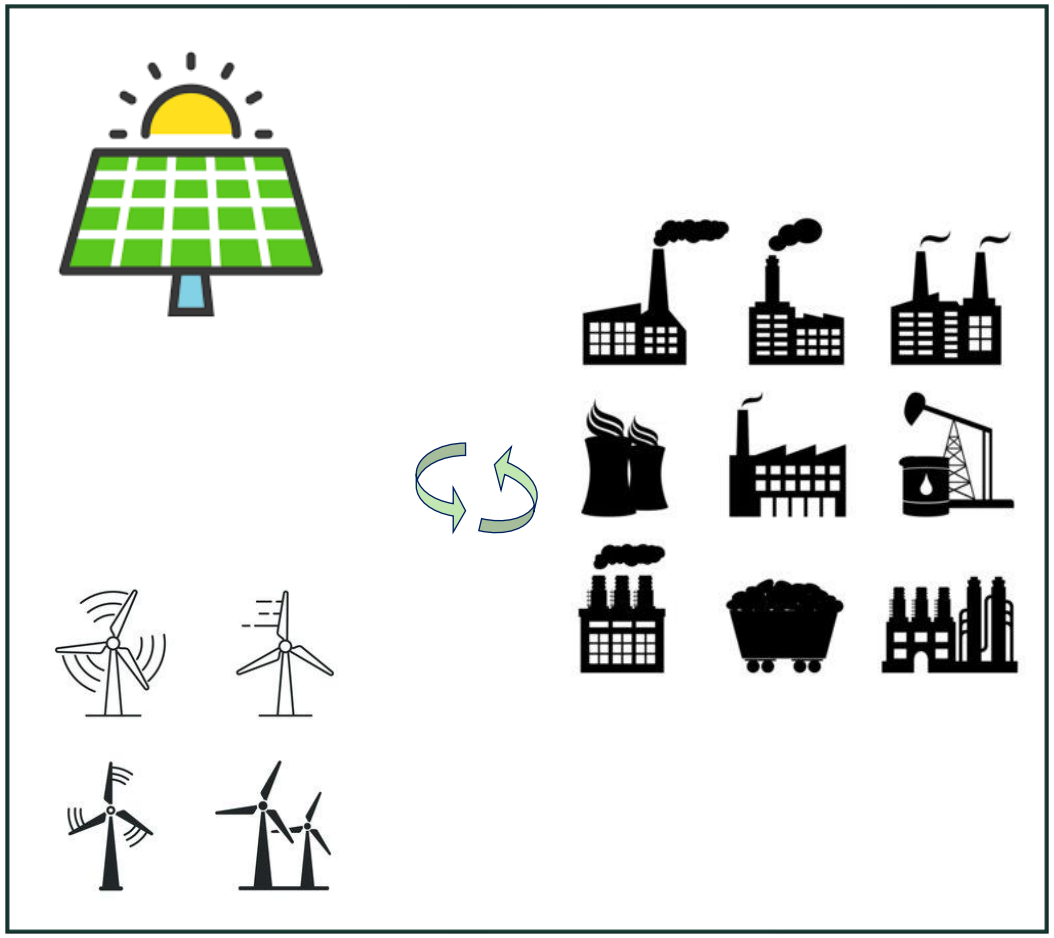
- Deployed in 2017
- This forecasts reserve levels using sophisticated Bayesian Belief Networks.
- Acts as a mechanism to address supply uncertainty.
- Over 1 billion forecasts are used to train the network using advanced AI techniques
- Retrained quarterly



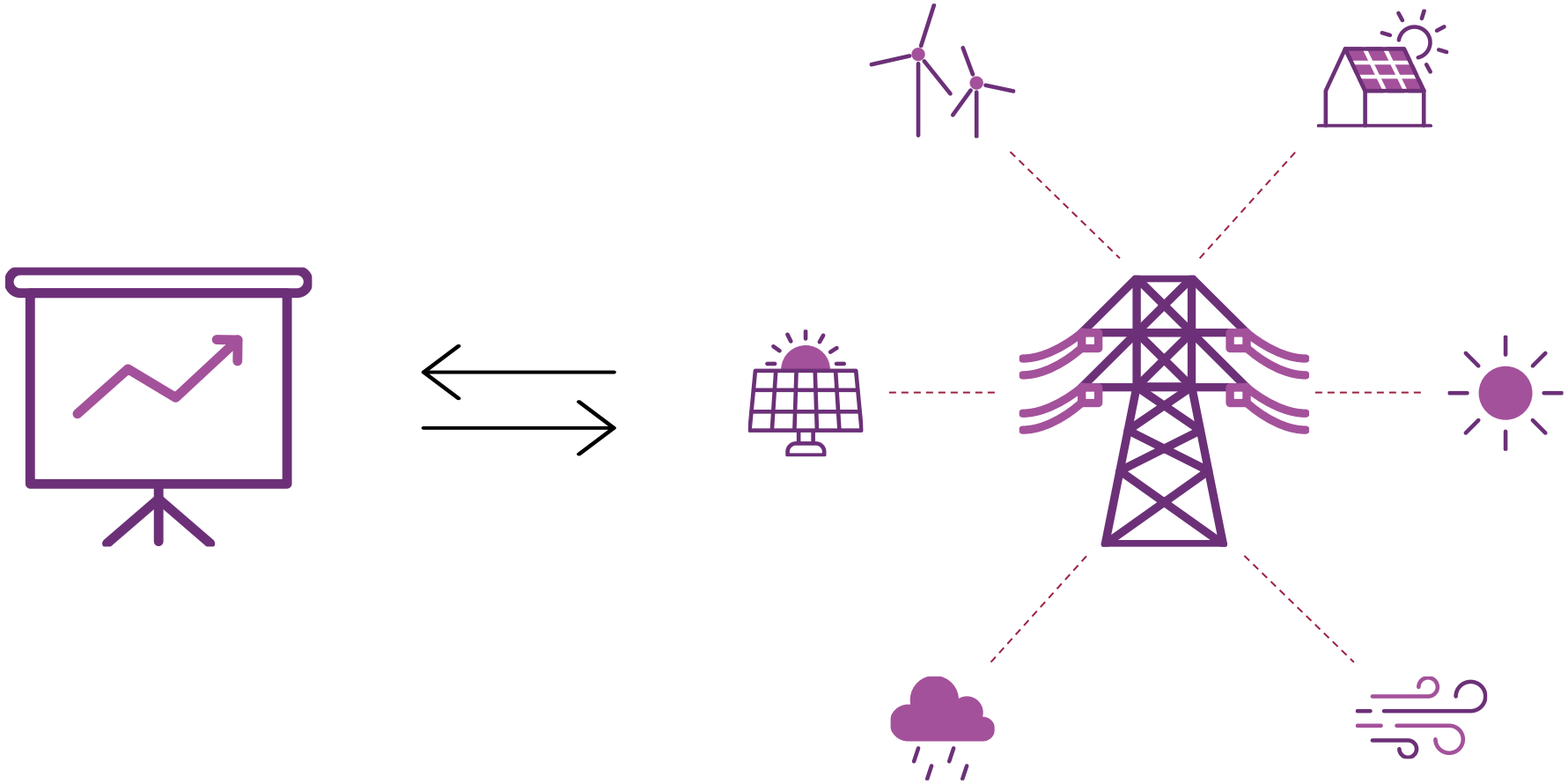
How to Improve the FUM Approach

Disaggregate FUM & Sources of Uncertainty for more intuitive and improved decision making





Probabilistic Forecasting for the future



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