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Power Available and High Wind Speed Shutdown

Andrew Kensley

11 September 2012

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Operating the Transmission System

As System Operator, National Grid's ability to balance generation and demand within the capability of the Transmission System is dependent upon accurate real time and forecast data

- Grid Code obligation currently requires a best estimate from generators of their output as Physical Notifications (PNs)
- The ability to manage extreme system events such as High Wind Speed Shutdown of wind turbines is also dependent on forecast and real time data
- Lack of accurate information in these areas may lead to increased balancing costs and reduced security of supply

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High Level Requirements

- An appropriately accurate measure of output
- Available power to measure:
  - Headroom capability
  - Footroom capability
  - Frequency response capability
- A measure of uncertainty in the estimate of output

Local and regional effects – ability to manage constraints

National effects – ability to manage frequency

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High Wind Speed Shutdown

David Lenaghan

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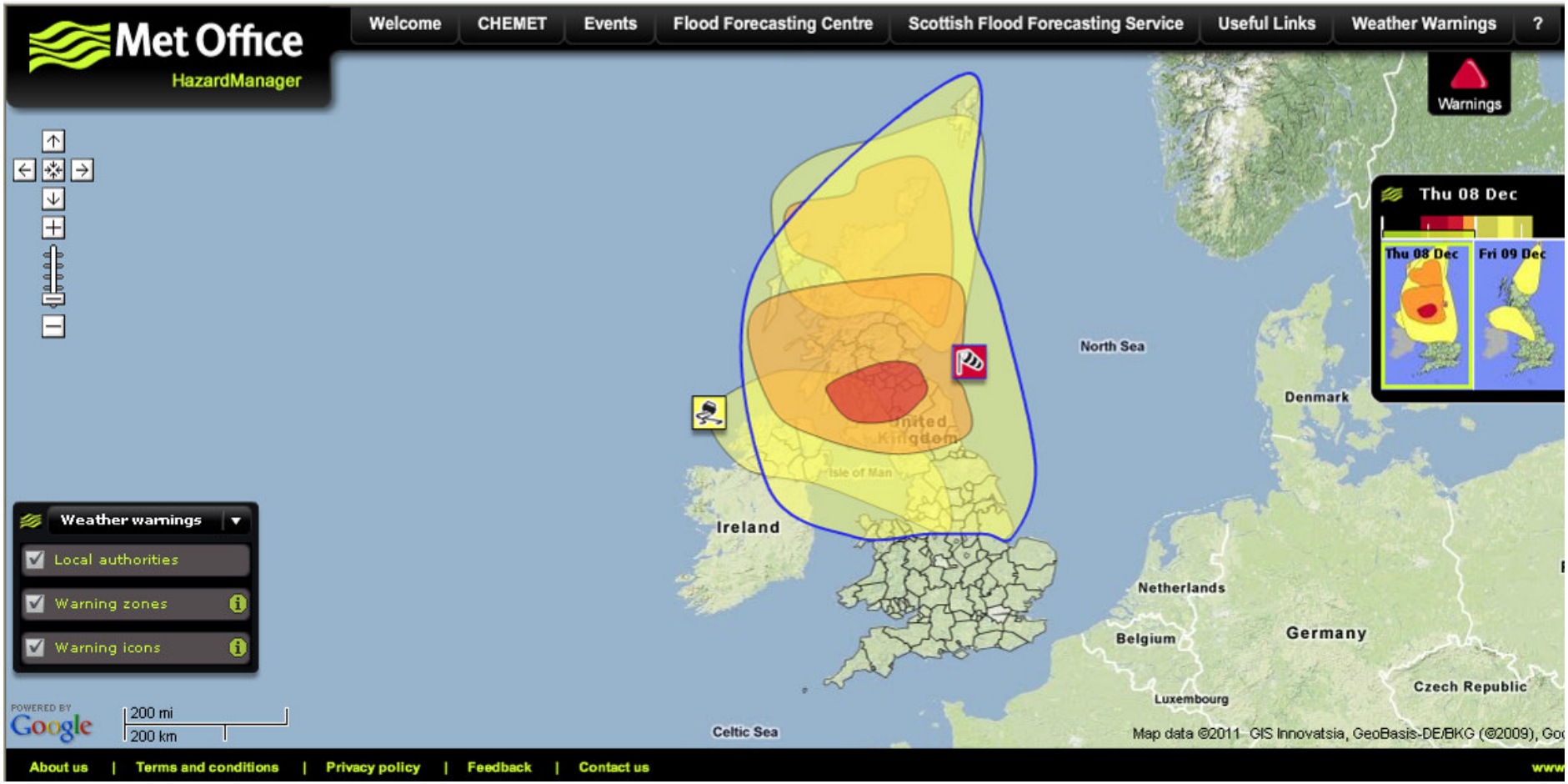
High Winds – 8th December 2011



Potential for Cut-outs – 8th December 2011

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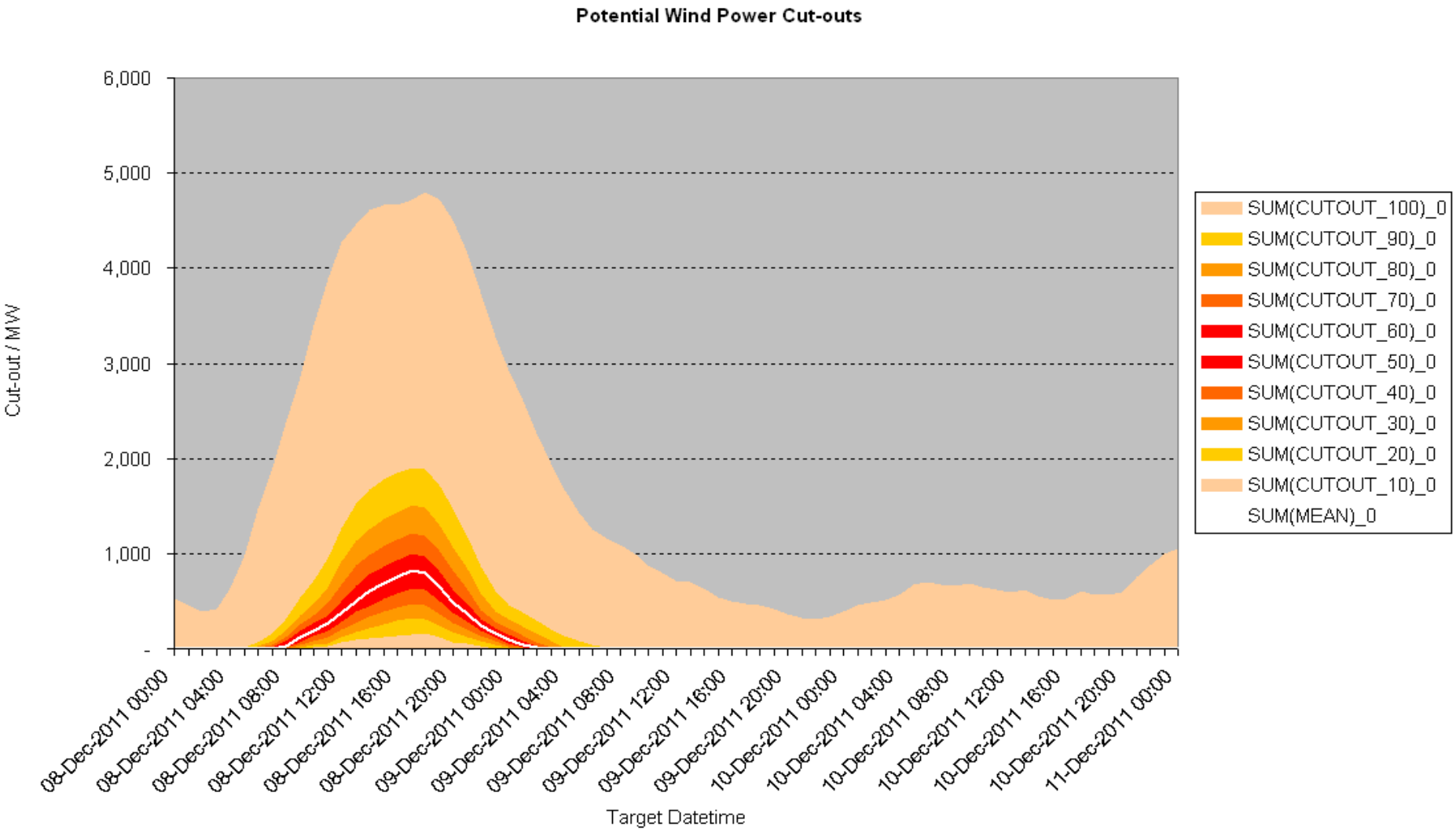

Wind Generation – Forecast and Actual

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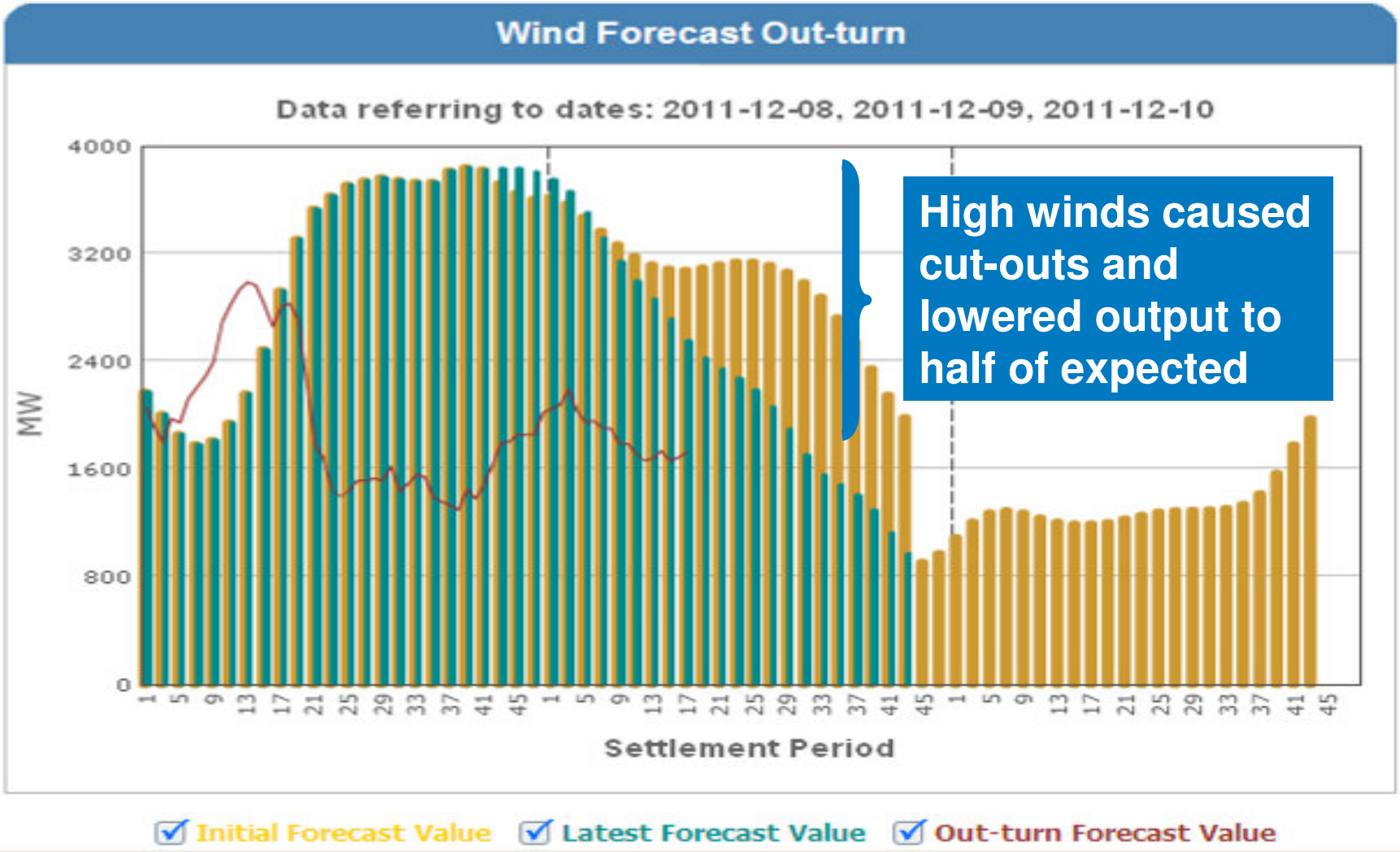

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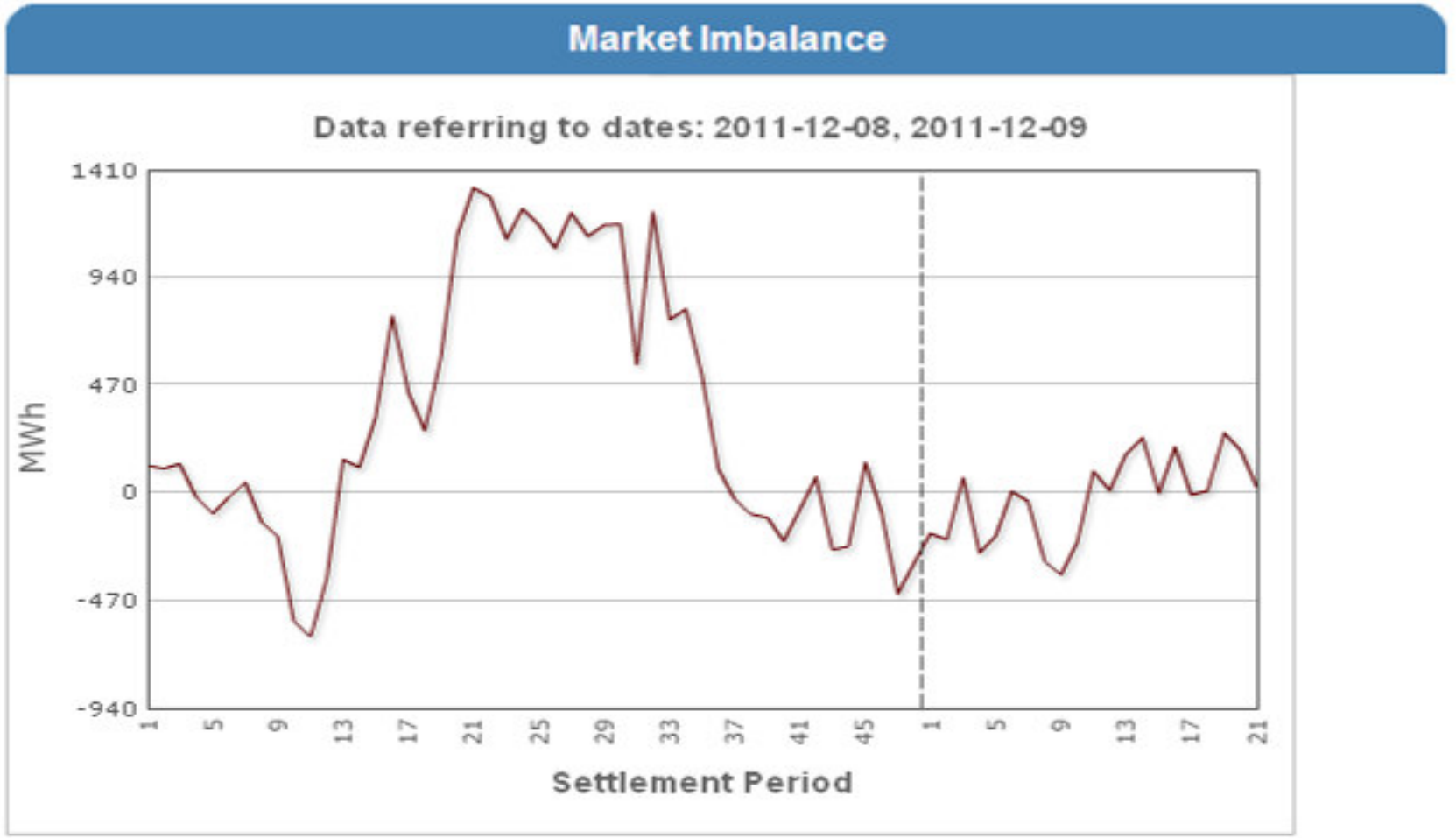
Net Imbalance Volume



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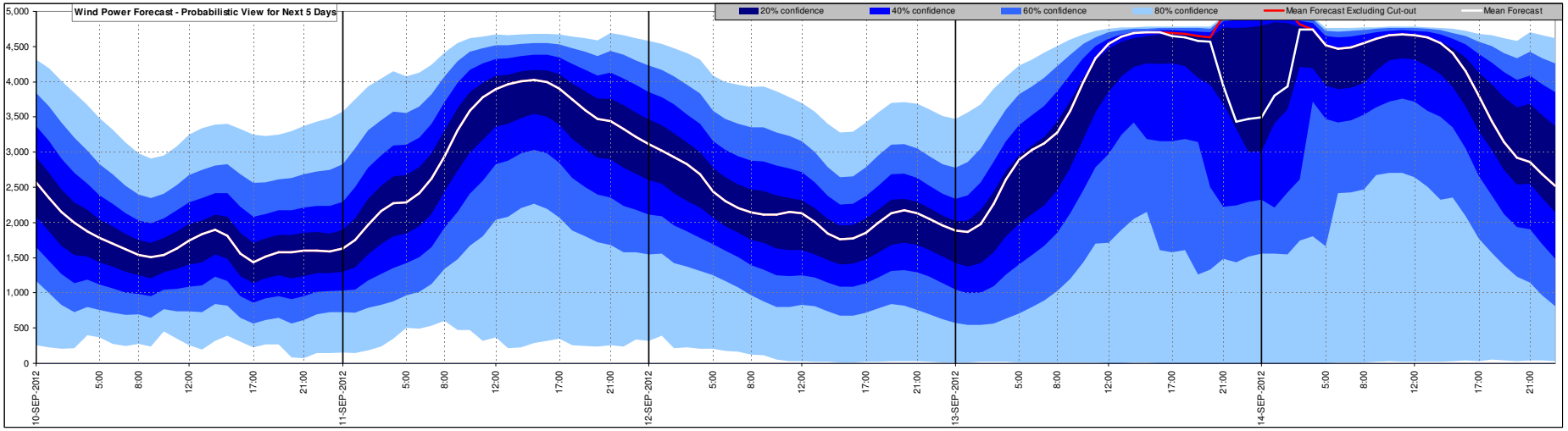
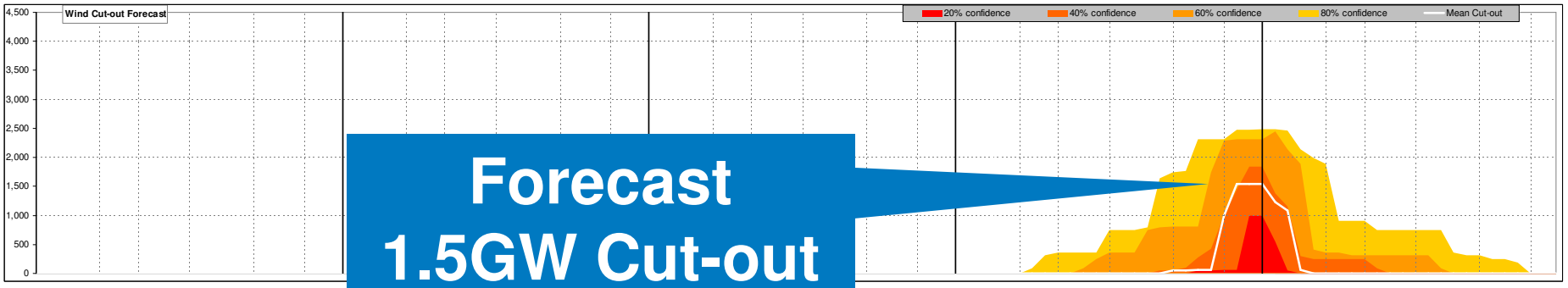
Forecast for this Thursday night…





Forecast 1.5GW Cut-out

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Physical Notification versus Metered Output

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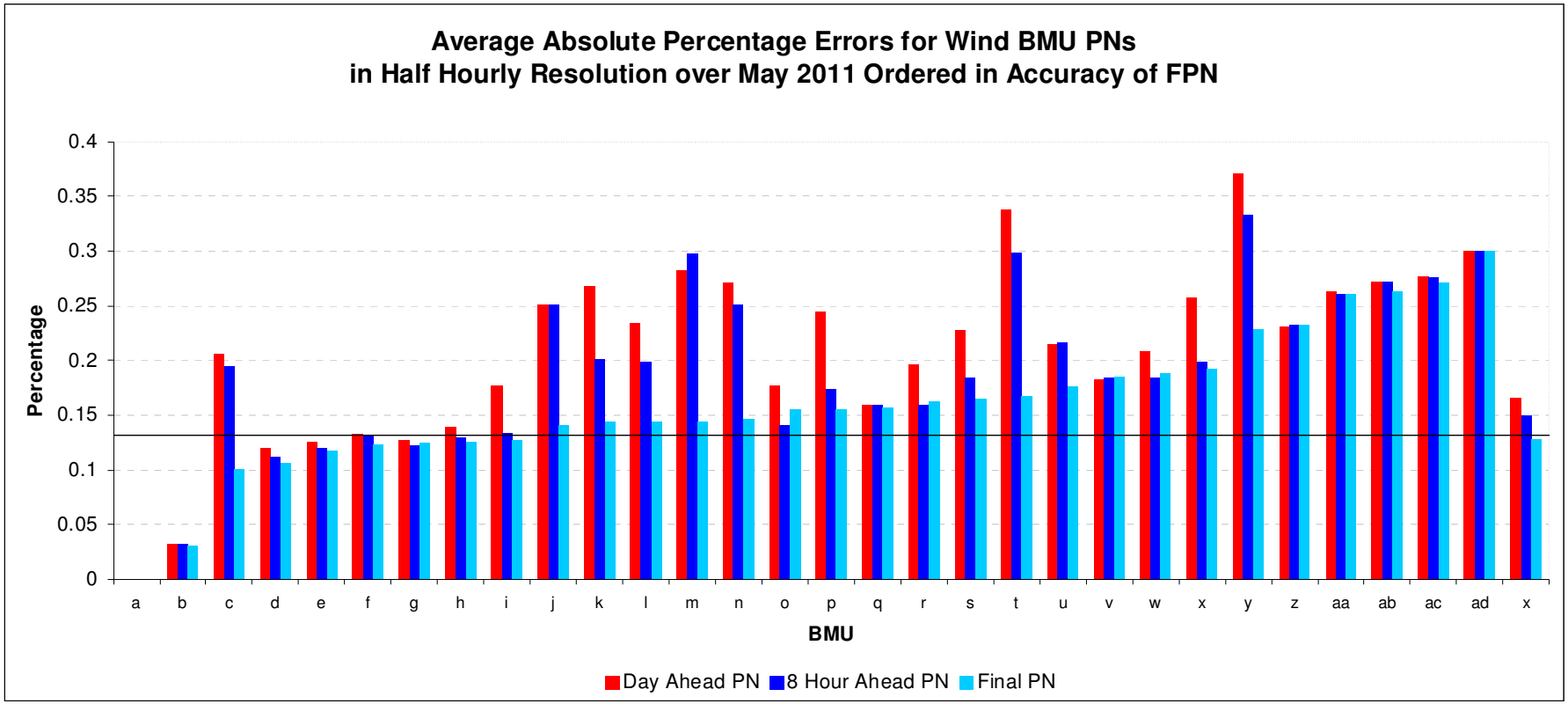
Wind BMU PN accuracy



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Comparing all Wind BMUs

Percentage error for PN following is typically around 15%

In general:

- the accuracy of PNs increases as real time approaches
- there is no bias towards either ‘under’ or ‘over’ forecasting

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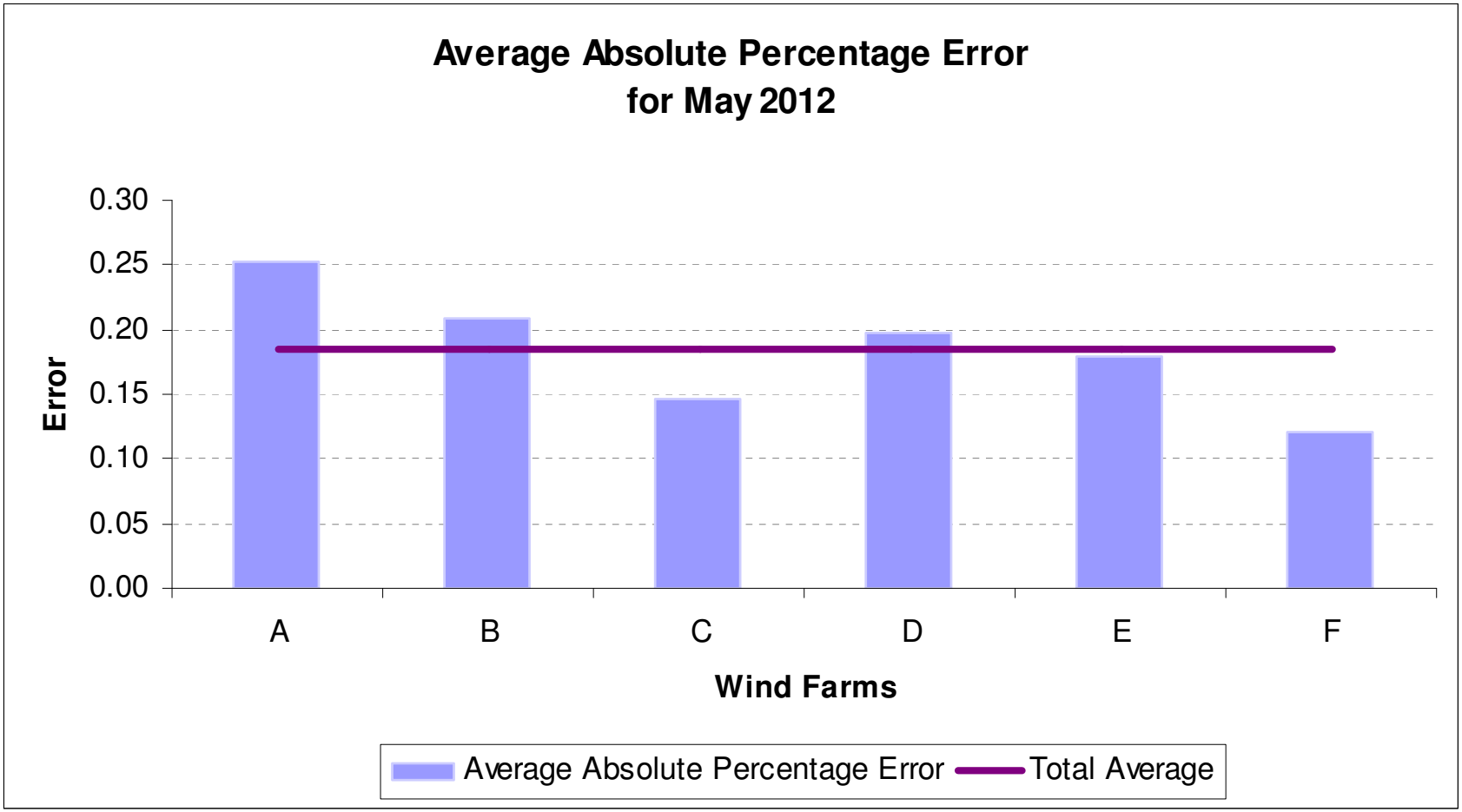
Recent analysis



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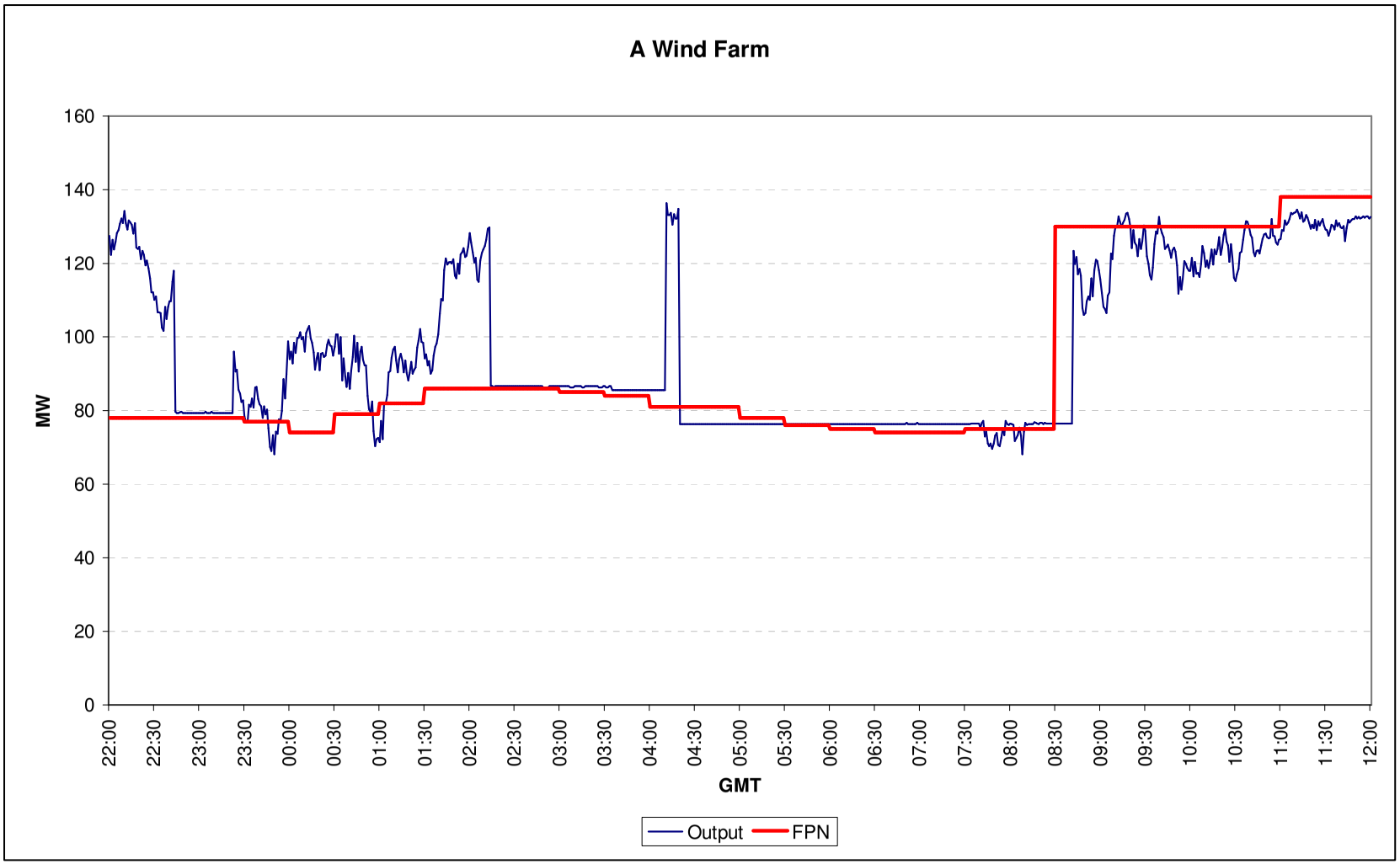
Recent Examples



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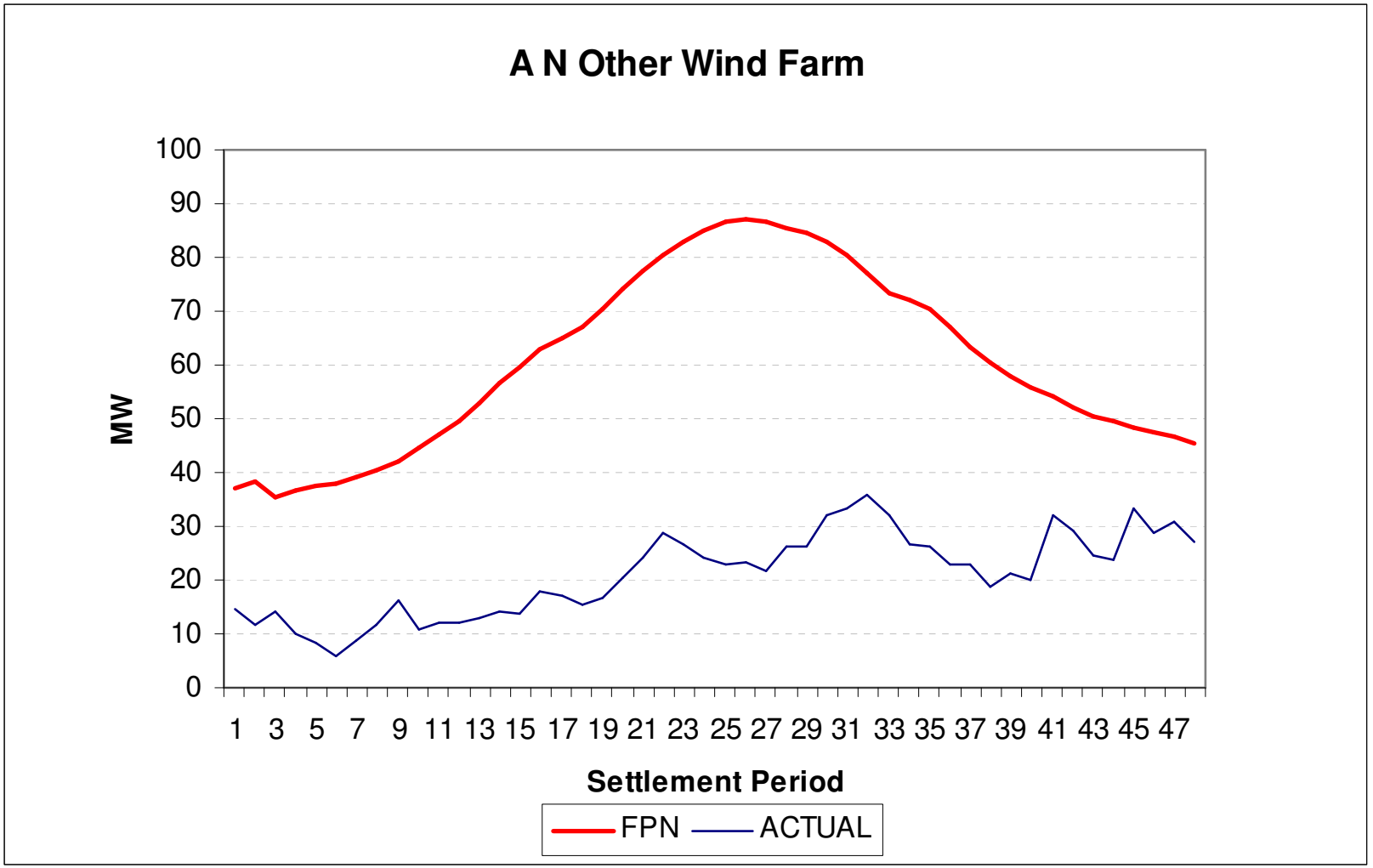
Recent Examples



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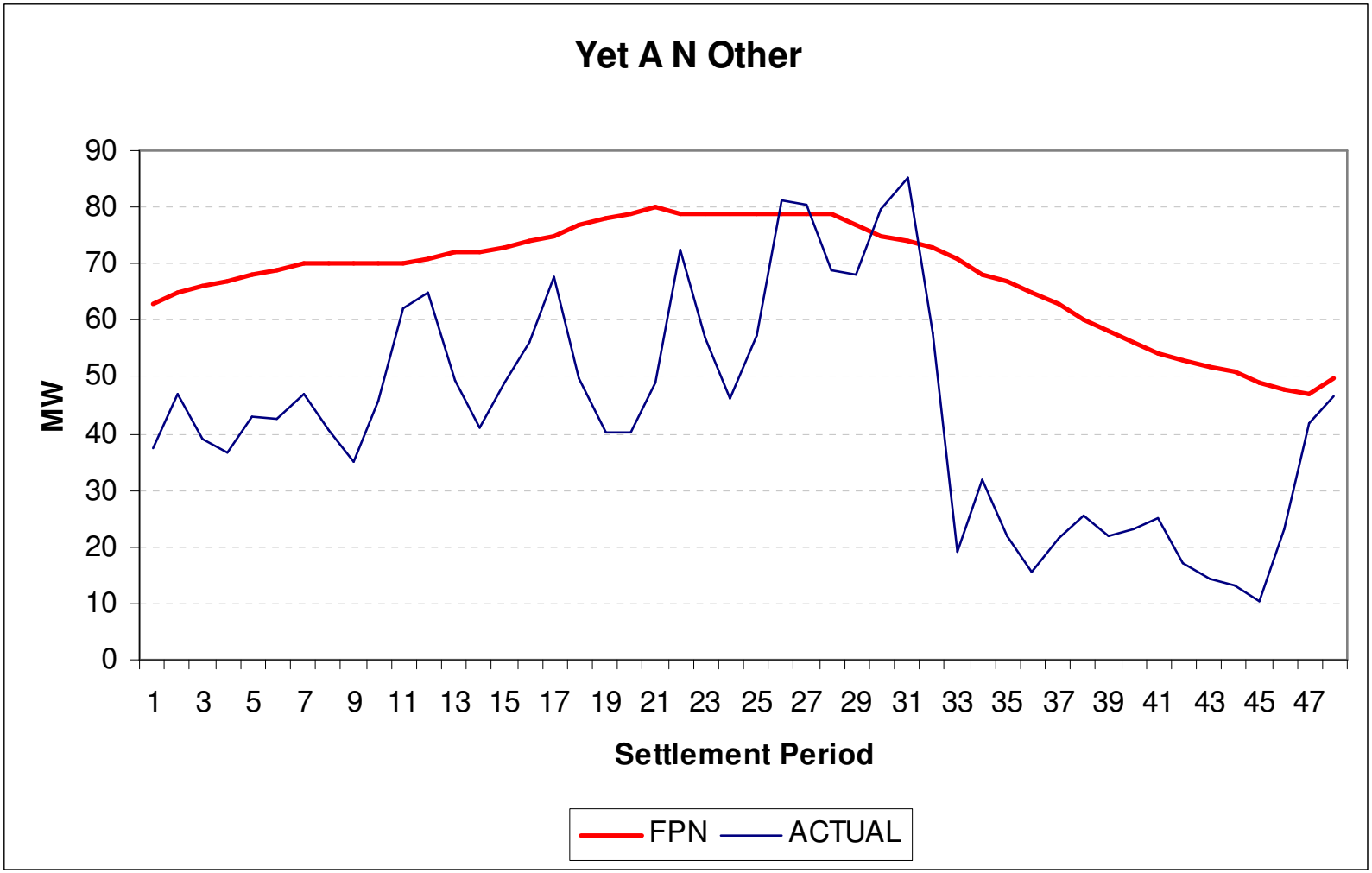
Recent Examples



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16th August 2012 NRAPM

- At 17:20 hours a Local NRAPM (Negative Reserve Active Power Margin) Warning was issued for Scotland for the period 00:30 – 06:00 hours.
- A shortfall of 600MW of available bid volume was identified
- High wind was forecast for this period
- Generation output was lower than forecast and at 00:00 hours the NRAPM Warning was cancelled

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Questions?