Energy and the Winter Capacity Margins

Presentation to the Security and Reliability Council

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Agenda

- Background
- Winter Energy Margin
- Winter Capacity Margin
- Next Steps

Background

- The Electricity Act 1992 and Government Policy Statement required the Electricity Commission (Commission) to develop energy and capacity adequacy standards (margins)
- Expected material breaches of these standards were intended to be triggers for interventions by the Commission to procure reserve energy and capacity
  - The Commission will procure Reserve Energy if the Winter Energy Margin is forecast to fall below 17% for New Zealand as a whole, or below 30% for the South Island, over the next 3 years
  - The Commission will procure Reserve Capacity if the Winter Capacity Margin is forecast to fall below 780 MW over the next 2 years
  - Procurement will balance the costs, benefits and risks of Reserve Energy/Capacity and focus on options which maximise overall welfare

Background

- The Electricity Industry Act 2010:
  - transferred the responsibility to System Operator to provide information of security of supply for short and medium term which apply the margins in the assessing security of supply
  - Required that the Electricity Industry Participation Code (Code) specified the functions of the System Operator
  - The Authority remains responsible for setting the margins
  - No requirement on any entity to procure reserve energy or capacity
- Sale of Whirinaki

Background

- Part 7 of the Code set out the System Operator's:
  - Performance obligations with respect to common quality and dispatch
  - Functions in relation to security of supply and supply emergencies
  - Performance review conditions

Functions in relation to security of supply

- Part 7.3 sets out the functions of the System Operator in respect of providing information on security of supply –
  - Publish at least annually a 5 yr+ security of supply assessment (ASA) which assist parties assess whether the 'security of supply standards' (margins) are likely to be met
  - Consult with those parties prior to the publishing the ASA
  - There are two energy security of supply standards:
    - Winter energy margin of 17% for New Zealand
    - Winter energy margin of 30% for the South Island
  - There is one capacity security of supply standard:
    - Winter energy margin of 780MW for the North Island

Standard for energy adequacy - Winter Energy Margin

- Published in 2008 - Winter energy margin of 17% for New Zealand and winter energy margin of 30% for the South Island. The difference between the expected amount of energy that can be supplied during the winter and expected demand during the winter, expressed as a percentage of expected demand
- Expected Supply/Expected Demand – 1 (ES/ED -1)
- Expected Supply (ES) will be determined by the following formula (all units in GWh):
  - ES = T + W + B + H
  - T = Maximum expected thermal generation available to meet winter (1 April to 30 September) energy demand allowing for forced and scheduled outages, available fuel supply and transmission constraints
  - W = Expected winter (1 April to 30 September) wind generation based on long-run average supply
  - B = Expected winter (1 April to 30 September) generation available from geothermal and cogeneration plants based on long-run average supply
  - H = Expected winter (1 April to 30 September) hydro generation based on mean inflows and including expected 1 April start storage of 2750 (2400) GWh for New Zealand (South Island).
- Expected Demand (ED) will be determined by forecasting the demand for electricity generation during the period 1 April to 30 September, allowing for demand response to electricity prices

Standard for capacity adequacy - Winter Capacity Margin

- Published late 2008 - expressed as a minimum 780MW margin of de-rated North Island supply over the average of the highest 200 half hour of winter North Island daytime demands
- North Island supply includes the contribution of supply from the South Island
- The Winter Capacity Margin will be determined by subtracting a measure of North Island expected demand from North Island expected capacity.
- Basis for 780MW
  - Economic standard – balance between the cost of reserve capacity (back-up peaking) against the cost of shortfall - rejected applying international norms or assessments based on good practice
  - Load Duration Curve (LDC) convolution approach - captures the interaction between supply and demand on a probabilistic basis

Next steps

- Further consideration of:
  - Summer capacity margin
  - Update winter energy and capacity margins given changes since they were set:
    - Pole 3
    - New generation
    - Decisions about existing generation