Reserve services in the National Electricity Market

Directions paper published for reserve services rule changes

The Australian Energy Market Commission (AEMC) invites stakeholder submissions in response to a directions paper on two rule changes that relate to reserve services in the National Electricity Market (NEM). The paper sets out the issues relating to the ability of current market frameworks to address variability and uncertainty in power system conditions.

This paper accompanies the Energy Security Board's (ESB's) post-2025 market design project directions paper. That project aims to develop advice on a long-term, fit-for-purpose market framework to support reliability that could apply from the mid-2020s.

Background

This paper furthers the AEMC's consideration of rule change requests received from Infigen Energy and Delta Electricity. These projects are being progressed concurrently with the ESB's consideration of reserve services, which is part of the resource adequacy mechanisms and essential system services market design initiatives under the post 2025 market design project.

An AEMC consultation paper was published on these rule change requests, along with five others, in July 2020. The issues raised relate to the ability of current market frameworks to address variability and uncertainty in power system conditions, particularly relating to net demand. The AEMC is collaborating closely with the ESB and other market bodies on this work, with the AEMC and ESB processes dovetailing as a single overarching reform process to address the issues.

Reserves as the power system transforms

Reserves are capacity that is available to change the supply/demand balance in the near future to keep the system secure and reliable. Currently we have both 'in-market' and 'out-of-market' reserves. In-market reserves are made up of capacity that has offered itself available in the energy and FCAS markets but has not yet been dispatched or activated. Out-of-market reserves are procured for specific purposes (e.g. the Reliability Emergency Reserve Trader (RERT)).

Participants in the current market make their own commitments to keep capacity in reserve based on price signals and the risks and operational costs associated with running their plant at a point in time. To date, the need for reserves has therefore been met through:

- market arrangements that price the need for energy and frequency control
- information provided to participants in those markets (through energy market outlook reports and lack of reserve notices), and
- interventions in those markets by the market operator.

Reserves are used for a range of purposes on the power system, which fall into two main groups:

- reserves needed for events that are forecast and are therefore expected by market participants ('expected events'), such as evening ramping requirements and peak consumer demand events, and
- reserves needed for events that are not forecast and therefore not expected by market participants ('unexpected events'), such as significant uncertainty in the level of net demand

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or certain security events.

Current arrangements are likely to provide sufficient 'in-market' reserves to address expected events but may not be sufficient to address increased variability and uncertainty as the power system transitions. The specific problem this gives rise to, and which the Commission considers needs to be addressed, is the inefficiency of interventions in the market to ensure there are sufficient reserves to address:

- net demand forecast uncertainty, and
- system security, up to the level to prevent a contingency event resulting in involuntary load-shedding.

Options to address reserve needs

A number of options are available to address this issue. One approach is to pursue incremental improvements to reduce variability and uncertainty, such as improving the accuracy of forecasts, the information available to market participants, and system design and operation.

Another approach is to address the risk of insufficient reserves by explicitly valuing the provision of reserve services. This would separate the provision of this service from energy and frequency control ancillary services (FCAS) markets, where 'in-market' reserves are currently valued implicitly. This paper outlines four options:

- **Co-optimised operating reserve market**: an operating reserve market that is co-optimised with the energy and FCAS markets, for resources with the capability to produce energy in the next dispatch interval.
- **Co-optimised availability market**: a market to procure availability in the dispatch interval 30-minutes ahead, co-optimised with the energy and FCAS markets.
- **Callable operating reserve market**: an operating reserve market that sets capacity aside from the energy and FCAS markets and calls upon it if it is required to become energy in a later dispatch interval (as proposed by Infigen Energy).
- **Ramping commitment market**: a 30-minute raise and lower "ramping" services market using the existing framework for FCAS market design (as proposed by Delta Electricity).

Consultation

The AEMC invites stakeholder feedback on this paper. The Commission is particularly interested in stakeholder views on:

- the nature of the need for reserves and how meeting this need will evolve as the power system transforms
- whether there is a material need for a new reserve service to address this evolving need, and
- if so, what the appropriate high-level design of a new reserve service should be, including how this could interact with existing arrangements both in the energy spot and secondary contract markets.

Written submissions are due by **11 February 2021**. These will feed into the progression of the ESB and AEMC's work on these issues.

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