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2021 Annual Market Performance Review: Final Report July 2020 – June 2021

The Reliability Panel's Annual Market Performance Review (AMPR) provides observations and commentary on the security, reliability and safety of the power system. This review is required under the National Electricity Rules. The annual review is becoming increasingly relevant as the power system faces a period of rapid transition, with the impacts of this transition already becoming apparent.

Purpose of the review

The final report sets out the Panel's findings for its annual market performance review for 2020-21. The review is conducted in accordance with the requirements of the NER and standing terms of reference issued by the AEMC. The purpose of the report is to:

- Provide stakeholders with consolidated information and expert commentary about the performance of the power system and market in a single publication.
- Highlight emerging trends to help inform the policy and investment decisions of governments, policymakers, market institutions and market participants.
- Identify the issues for attention relevant to the frameworks or mechanisms used to deliver reliability, security and safety.

The final report compiles information collected from a number of public sources including the Australian Energy Market Operator, the Australian Energy Regulator, jurisdictional regulators and market participants. The value of the report comes from the Panel, with its diverse membership, collating and interpreting the data to make sense of what is happening across the power system and market.

The final report builds on the key issues identified in the Panel's Market performance update published in December 2021.

Key findings

The power system is undergoing a fundamental transformation in terms of how electricity is consumed and in how and where it is supplied. Thermal generators are retiring faster than expected, corresponding with significant growth in inverter-based resources (IBR). These changes result in evolving

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market and price outcomes and create a challenging environment for maintaining a reliable and secure power system.

Reliability

Reliability outcomes in the NEM in 2020-21 were satisfactory. There were some signs of strain on reliability, however, the reliability framework was robust in dealing with these events. Key reliability outcomes in 2020-21 include:

- The reliability standard and interim reliability measure (IRM) of 0.002% and 0.0006% unserved energy (USE) respectively were not breached
- AEMO forecast no breach of the reliability standard in the 2021 ESOO until 2028-29 in Victoria and 2029-30 in NSW. Additionally, no breach of the interim reliability measure is currently forecast, however AEMO is updating this forecast following the announcement of the early retirement of Eraring power station.
- There were no reliability events where supply was interrupted due to a shortfall of available capacity and reserves.
- AEMO issued 53 actual lack of reserves notices, a large increase from 17 in the previous period.
- RERT was activated on two occasions (in NSW and Queensland). However, one of these occasions was to manage security outcomes. The total cost of these activations was $0.66m.
- The cumulative price threshold (CPT) was not breached for energy. The CPT was breached for frequency control ancillary services (FCAS) on 5 June 2021 in the fast contingency raise service in Queensland. The administered price cap was consequently applied until 10 June 2021.
- Load forecasting accuracy was marginally worse in 2020-21 than in 2019-20. Wind energy forecast accuracy improved, and solar energy forecast accuracy was flat compared to the previous year.
- The number of participants producing self-forecasts for renewable energy generators has increased substantially, with the accuracy of these forecasts exceeding AEMO's wind and solar energy forecasting systems.
- Transmission unsupplied minutes decreased in NSW, Victoria, and South Australia, and increased in SA and Tasmania.

Security

While overall security outcomes were good in 2020-21, security continues to remain a challenge for the sector. This is particularly driven by the effects of climate change as well as the decreasing reliability and retirement of ageing thermal generators. Key security outcomes for 2020-21 include:

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- There were no events where the power system, was not in a secure operating state for more than 30 minutes, down from three in 2019-20.
- Reviewable operating incident numbers were similar to 2019-20.
- The upward trend in the number of power system directions continued. These directions were almost exclusively used to manage system strength in South Australia.
- Frequency performance improved notably in both the mainland and Tasmania following the implementation of mandatory primary frequency response from September 2020.
- FCAS costs trended down, however, localised FCAS requirements in Queensland and concurrent coal unit outages resulted in higher costs in the second quarter of 2021.
- The number of changes to constraints in NEMDE was more than 2019-20 but less than 2018-19.
- There was a large increase in the number of market notices issued by AEMO in 2020-21, driven by automated dispatch price reviews and lack of reserve notices.

Implications

While the frameworks are adequate to manage reliability and security challenges in the present, looking forward and extrapolating current trends suggests that changes to existing reliability and security frameworks and the introduction of new ones will be necessary. A key example is the exit of thermal plant, the schedule of which is accelerating. This is leading to increased pressure on reliability as well as security challenges, including issues related to minimum system load, system strength, inertia, and voltage control.

There is an extensive work program underway to address these reliability and security challenges. The ESB, AEMC and Panel are collaborating with market bodies and industry to progress this work program.

Who is the Reliability Panel?

The Reliability Panel is a specialist body within the Australian Energy Market Commission (AEMC). The Panel is comprised of members who represent a range of participants in the national electricity market, including consumer groups, generators, network businesses, retailers and the AEMO. It is chaired by an AEMC commissioner.

The National Electricity Law sets out the key responsibilities of the Panel. These include:

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- Monitoring, reviewing and reporting on the safety, security and reliability of the national electricity system
- Providing advice in relation to the safety, security and reliability of the national electricity system, at the request of the AEMC

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