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Ms Nicola Cusworth
Chair
Economic Regulation Authority (ERA)
Perth

Submitted online

Dear Ms Cusworth

2019 WHOLESALE ELECTRICITY MARKET REPORT FOR THE MINISTER

AEMO welcomes the opportunity to provide this submission in response to the ERA's Issues Paper for its Report to the Minister for Energy on the Effectiveness of the Wholesale Electricity Market (WEM) 2019.

AEMO supports the ERA's approach to the 2019 review. The Issues Paper recognises the growing challenges to maintaining power system reliability and security in the WEM; acknowledges the many issues that are to be addressed by the WA Government's Energy Transformation Strategy (ETS); and emphasises that the ETS is part of a longer journey of market transition that will continue for many years as the power system continues to evolve. In this context, AEMO welcomes the focus in the Issues Paper on matters that may sit outside the ETS scope, or that can be addressed in a shorter timeframe.

AEMO is playing an important support role in the development and implementation of the ETS reforms, consistent with its obligations in the WEM Rules. The large scope of the ETS reforms will require significant resource commitments from AEMO and other industry participants, and may constrain the availability of resources for other market changes outside of the ETS reforms. It will be important that any changes to the WEM that are made prior to the ETS reforms are small in scope, will endure post-reform and/or have a high benefit-to-cost ratio.

While AEMO is working on the implementation of the ETS reforms, as relevant to AEMO's functions, it will continue to operate and settle the WEM, and manage the reliability and security of the power system as efficiently and transparently as possible under the existing framework.

Growing power system variability

AEMO agrees with the discussion in the Issues Paper on the growth of variable generation, including large-scale wind and solar facilities and uncontrollable, limited visibility, rooftop PV, and the challenges that this presents. AEMO has discussed this topic in various public reports

and submissions, including the report titled *Integrating Utility-scale Renewables and Distributed Energy Resources in the SWIS*[1].

In addition to the increasing variability, the growth of non-synchronous generation is highlighting that some essential system services that are needed to keep the power system secure, such as inertia and system strength, are not currently recognised in the WEM Rules[2].

Under the current market and network access arrangements, the growing variability requires AEMO to make trade-off decisions on a manual basis at increasing frequency, with technical and commercial implications. For example:

- AEMO remains responsible for scheduling and dispatching Synergy's generation facilities in accordance with Synergy's portfolio-level bids, with the bulk of the Ancillary Service requirements still provided by Synergy's generation. Intra-day volatility is increasing the complexity of unit commitment, de-commitment and ramping decisions. This can lead to the physical operation of Synergy's generation diverging more often from the assumptions that underpinned Synergy's Balancing Submissions, which must be lodged hours in advance[3]. This can result in inefficient market outcomes and/or detrimental financial outcomes for Synergy.
- For periods when high variability is forecast, AEMO must consider whether additional Load Following Ancillary Service (LFAS) capacity should be pre-emptively procured ahead of time (if AEMO can reasonably foresee the higher variability prior to LFAS market gate closure). While it is preferable to utilise competitive market arrangements and determine a competitive price for LFAS, AEMO must weigh this against the risk of imposing unnecessary costs on customers if the additional LFAS was not needed. AEMO notes that Backup LFAS from Synergy can be utilised where higher variability was not reasonably foreseen, but that prices for Backup LFAS are not competitively determined.
- As described in the Issues Paper, the connection of new generation in the North Country region, via the Generator Interim Access (GIA) solution, is expected to result in contingencies that are larger than the largest individual generating unit on the network[4]. Contingency management will require choices between dispatch options, including

[1] Available at https://aemo.com.au/Electricity/Wholesale-Electricity-Market-WEM/Security-and-reliability/Integrating-utility-scale-renewables, accessed 10 December 2019.

[2] AEMO discussed these system security requirements in its *Power System Requirements Reference Paper*, March 2018, available at https://www.aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Power-system-requirements.pdf, accessed 16 December 2019.

[3] AEMO is not necessarily aware of the assumptions underpinning Synergy's Balancing Submissions.

[4] The Issues Paper (p22) indicates that the outage of a single 330 kV transmission line could isolate the Yandin and Warradarge wind farms as well as the NewGen Neerabup gas-fired power station. Western Power has indicated to AEMO that NewGen Neerabup will only form part of this network contingency on rare occasions.

procurement of additional Spinning Reserve Service to cover the larger contingency and curtailment of this low-cost generation to cap the size of the largest contingency[5].

- The continuing growth of variable renewable energy will require AEMO to make trade-off decisions between procurement of additional Ancillary Services (which would be communicated through the annual Ancillary Services report to the extent possible) and the curtailment of large-scale[6] wind and solar facilities to limit volatility, especially in stormy conditions.

AEMO notes that the ETS reforms include measures that will seek to automate and optimise many of these trade-off decisions, allowing more transparent decision-making to occur closer to real time. AEMO considers that these measures are essential for efficient management of an increasingly variable power system.

Crucial ETS reforms for an increasingly variable and non-synchronous power system include:

- Re-design of the essential system services framework to better manage the security and stability of the changing power system, maximising the various capabilities of plant connected to the power system, and recognising and procuring the full suite of essential system services that are required.
- The introduction of security-constrained economic dispatch, to combine technical and commercial considerations into a common, automated market and dispatch process.
- Co-optimisation of energy and essential system services, to allow the market to determine the most efficient and economical dispatch outcome.
- Shortening (or removal) of gate closure provisions, to shift decision-making closer to real time, so that better information can support better decisions.
- The Distributed Energy Resources (DER) Roadmap, to guide the integration of DER into the power system, which is expected to enable incentives for DER owners to contribute to power system reliability and security, and to lower total system costs by doing so.
- The Whole of System Plan (WoSP), to identify the best investments in the power system to maintain security and reliability at the lowest sustainable cost, which will assist in the transition to a lower-emissions power system.

Harnessing the capabilities of all available technologies

The goals of efficiency, reliability and security can be advanced by minimising barriers to the integration of new technologies. The flexibility of some of these technologies offers opportunities for managing the increasing variability of the power system.

The Issues Paper specifically references the barriers to the uptake of storage technologies, including batteries. AEMO agrees that the current arrangements do not allow storage facilities

[5] The GIA solution provides for curtailment of GIA generators to protect network thermal limits. It does not consider other system security limits or requirements, including Ancillary Service requirements.
[6] Importantly, AEMO has no ability to limit the variability of behind-the-meter PV.

to offer the full range of services that they are capable of providing, which reduces the commercial viability of investment in storage capacity.

As part of the ETS reforms, AEMO is supporting a review of the registration and participation framework, which aims to facilitate the participation of new and emerging technologies (including storage facilities and DER) in energy and essential system service markets[7]. The ETS reforms will also consider the eligibility of storage facilities to receive Capacity Credits proportional to their contribution to supporting power system reliability[8]. In the interim, to support early investment in storage, AEMO has developed an Information Paper[9] and a guideline[10] to describe the available options that exist for registration of storage facilities and participation in markets under the current WEM Rules.

The Issues Paper also describes barriers to participation of demand response. Under the Reserve Capacity Mechanism, demand response can be recognised either through:

- assignment of Capacity Credits, which entitles the demand response provider to capacity revenue in return for a commitment to (among other things) curtail demand when dispatched by AEMO; or
- reduced capacity costs, by self-curtailing in order to reduce the Individual Reserve Capacity Requirement (IRCR).

The dispatchability of demand response under the first option can be extremely valuable for the operation of an increasingly variable power system. However, the risk-reward trade-off for the demand response provider is currently tipped heavily towards the second option, as the potential IRCR cost saving far outweighs the potential Capacity Credit revenue, though the demand response provider does face greater risk due to the need to predict the Trading Intervals that may be used in the IRCR calculation. While self-curtailment to reduce IRCR is beneficial for market efficiency, it can create operational challenges as it is not transparent and is difficult for AEMO to forecast.

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[7] The future participation of energy storage facilities is described by the Energy Transformation Taskforce in the *Energy Scheduling and Dispatch Information Paper*, 6 August 2019, available at https://www.wa.gov.au/government/document-collections/taskforce-publications, accessed 10 December 2019.

[8] Transformation Design and Operation Working Group, meeting 3, 22 October 2019, slide 36, available at https://www.wa.gov.au/organisation/energy-policy-wa/energy-transformation-taskforce-consultation, accessed 10 December 2019.

[9] *Interim Pathway to Enable the Registration of Energy Storage Systems in the WEM, Information Paper*, June 2019, https://www.erawa.com.au/cproot/20460/2/Interim-Pathway-to-enable-the-Registration-of-Energy-Storage-Systems-in-the-WEM.pdf, accessed 5 December 2019.

[10] AEMO, *Participation Guideline for Energy Storage Systems in the WEM*, 2019, https://aemo.com.au/-/media/Files/Electricity/WEM/Participant_Information/Guides-and-Useful-Information/Guidelines/Participation-Guideline-for-Energy-Storage-Systems-in-the-WEM.pdf, accessed 5 December 2019.

AEMO notes that rule changes developed by Energy Policy WA[11] would amend the Reserve Capacity Price earned by demand response providers, and a Rule Change Proposal is being considered that would amend the quantity of Capacity Credits that demand response providers could receive.[12] AEMO supports these changes as they would rebalance the risk-reward trade-off for demand response providers and better recognise the value of dispatchable demand response.

Optimisation of generation and network decisions

AEMO agrees that there is currently limited co-ordination of planning and investment processes between network and market mechanisms in the WEM. Western Power and AEMO each prepare long-term planning reports[13], but these are largely developed in parallel. Consequently, in response to Question 3 in the Issues Paper[14], AEMO considers that it is difficult to ascertain whether costs are being minimised under current arrangements.

AEMO anticipates that the WoSP, which is under development through the ETS, will play an important co-ordinating role between network and market mechanisms. It seeks to identify the best long-term investments in the power system – considering potential generation, network, DER and other customer-side investments – to satisfy consumer demand for reliable electricity, within the constraints of the power system, at least cost. AEMO is collaborating with Energy Policy WA and Western Power in the preparation of the first WoSP, which is scheduled for completion by mid-2020.

The transition to a constrained network access regime will elevate the importance of the WoSP. The current unconstrained network access regime has provided Western Power with an ability to coordinate new generator connections, but has also presented barriers to new generator investment. The WoSP will provide the forward planning that is needed to support efficient generation investment in a constrained network access regime, while maintaining the ongoing security and reliability of the power system.

AEMO considers that it is well-suited to lead the development of future WoSPs due to its:

- Independence, with AEMO unable to receive financial advantage from WoSP recommendations.

[11] Available at https://www.wa.gov.au/government/document-collections/improving-reserve-capacity-pricing-signals, accessed 5 December 2019.

[12] Rule Change RC_2019_01: The Relevant Demand Calculation, available at https://www.erawa.com.au/rule-change-panel/market-rule-changes/rule-change-rc_2019_01, accessed 5 December 2019. See also AEMO's submission on the same web page.

[13] AEMO prepares the Electricity Statement of Opportunities. Western Power prepares its Annual Planning Report and makes five-yearly Access Arrangement submissions to the ERA.

[14] Question 3: "*Is the objective of minimising costs to consumers materially compromised by a lack of whole-of-system coordination? What is the best way to ensure that such decisions are in the long-term interests of consumers and meet the market objectives?*"

- Whole-of-system visibility and access to confidential market cost data, which provide valuable inputs for WoSP modelling and analysis, allowing technical and commercial considerations to be balanced in the long-term interests of consumers.
- Experience from preparing the Integrated System Plan in the National Electricity Market.

AEMO anticipates that other ETS reforms will improve co-ordination between network and market operational processes:

- The introduction of security-constrained economic dispatch will allow for market-based quantification of the impact of network congestion or outages. While AEMO currently encourages changes to network outages when it identifies the potential for high constraint costs, this improved information will greatly assist this process. More accurate, transparent and forward-looking data can also support business cases for network investment that result in lower cost outcomes for consumers.
- Revised frameworks for reliability and security standards, and associated obligations, will clarify the respective responsibilities of Western Power and AEMO, and the interactions between the organisations. Additionally, changes to the governance mechanisms for the Technical Rules endorsed by the Energy Transformation Taskforce will allow for a more flexible and inclusive approach to updating power system standards in the future.
- Changes to the mechanisms for establishing and monitoring generator performance standards will improve system modelling capabilities and information sharing between AEMO and Western Power.

Oversight of market evolution

The ETS reforms will provide foundational, step-change advances in the design and operation of the WEM. Such a major reform program will necessarily influence the prioritisation and assessment of smaller rule change proposals, given the need to consider alignment and consistency of market changes. However, AEMO recognises the temporary nature of the ETS and agrees that there is merit in considering long-term oversight of ongoing market evolution.

In response to Question 4 in the Issues Paper[15], AEMO supports a single entity having responsibility for overseeing market evolution and having the capability to develop complex rule change proposals for the WEM Rules and Technical Rules. This entity could consider matters raised by stakeholders, with prioritisation of these rule changes guided by transparent, consultative processes and be informed by the broader context of government policy.

When choosing the best organisation to perform this role, it is important to ensure that the organisation has clear visibility of government policy, avoid introducing or amplifying conflicts

[15] Question 4: "*Do stakeholders share the ERA's concerns about rule changes to enable market development post reform? Should a single entity be given responsibility for ongoing market development? If so, which entity is best placed to have this responsibility and why? What governance arrangements should be placed on that entity?*"

of interest, and ensure that the long-term interests of consumers are represented in decision-making.

AEMO recognises the efforts of the Rule Change Panel to collate and track WEM Rules issues that have been raised by stakeholders through the Market Advisory Committee. This will be a valuable starting resource for the organisation that is tasked with overseeing market evolution.

Operation of the rule change process

AEMO agrees that the unpredictable nature of rule change activity can be challenging for the Rule Change Panel, AEMO and other organisations, particularly with respect to resource planning and funding. It can be difficult, and costly, to maintain resources to support the uncertain and fluctuating workload.

AEMO provides important support to the rule change process, due to its central roles of market and power system operation. Each rule change proposal requires a different level of support from AEMO, dependent on the scope and nature of the proposed rule amendments. AEMO uses its best endeavours to provide this support to the Rule Change Panel in a timely manner. However, AEMO must balance this supporting role with its operational functions and other functions under the WEM Rules and the Gas Services Information Rules (including to prepare for, and facilitate the implementation of, the ETS reforms), acting within its approved Allowable Revenue as an efficient, prudent operator.

In response to Question 5 in the Issues Paper[16], AEMO considers that the prescription of requirements and deadlines on AEMO, the ERA and other Rule Participants to provide support for the rule change process would be challenging and could have unintended outcomes.

- AEMO's operational obligations will always need to take priority to ensure that the power system operates reliably and securely, and the markets function properly, due to the direct impacts of these functions on consumers.
- AEMO may require additional resources, despite the uncertain and fluctuating workload, to minimise the compliance risk associated with prescribed obligations. The cost of these additional resources would need to be funded by Market Participants.
- It will be difficult to prescribe a 'one size fits all' process, given the varying scope and nature of rule change proposals. For example, the Issues Paper cited rule changes RC_2014_03: Administrative Improvements to the Outage Process and RC_2017_02: Implementation of 30-Minute Balancing Gate Closure as being subject to ongoing delays. AEMO observes that these rule changes will need to be substantially changed from the original proposals, and have required complex and time-consuming investigations and analysis by AEMO. The assessment of these proposals also requires consideration of the impact of the ETS reforms (which are still being developed).

[16] Question 5: "*Do stakeholders share the ERA's concerns about the rule change process? How could the rule change process be changed to ensure parties progress rule change proposals in line with priorities prescribed by the MAC and the Rule Change Panel?*"

AEMO observes that rule change prioritisation and assessments have been particularly challenging in recent years in the context of major WEM reform (the ETS and previous WA Government reform programs). Given the significant resource requirements of the ETS reforms, AEMO cautions against changes to the rule change process until the effectiveness of the process can be assessed under business-as-usual conditions.

AEMO welcomes discussion on this submission and would be pleased to provide further assistance to the ERA regarding the matters highlighted. If you would like to discuss or have any questions, please do not hesitate to contact me.

Yours sincerely

Cameron Parrotte
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