

Reliability Frameworks Review - Terms of Reference

Under section 45 of the National Electricity Law (NEL), the Australian Energy Market Commission (AEMC or Commission) has initiated a Review into the regulatory and market frameworks necessary to support the reliability of the electricity system.¹

Over the past year, concerns about reliability have been on the rise. Load shedding events on low reserve days, pre-emptive action and announcements from jurisdiction governments and recommendations made by the Finkel Panel in the *Independent Review into the Future Security of the National Electricity Market* have led to a greater focus on reliability. Australian Energy Market Operator (AEMO)'s latest Energy Supply Outlook publication concluded that:

*AEMO expects all NEM regions will meet the reliability standard set in the NER over the next two years based, on the generation and storage expected to be available. There is, however, still a risk of electricity supply falling short of demand, especially in extreme conditions... South Australia is considered most at risk of breaching the reliability standard."*²

The AEMC considers that it is timely to assess whether the current reliability frameworks are appropriate given the growing concerns, as well as additional factors affecting reliability, including a changing generation mix and greater opportunities for demand-side innovation.

This Review will be coordinated with related projects being undertaken by the AEMC's Reliability Panel particularly in relation to its work on the *Reliability standard and settings review*, as well as the ongoing technical work being undertaken by AEMO.

Background to reliability in the NEM

A reliable power system is one which has enough capacity (both energy and networks) to supply customers i.e. a system where there is a high likelihood of consumer demand being met. This requires a number of elements: efficient investment and retirement decisions by market participants resulting in an adequate supply of dispatchable energy, a reliable

¹ Part 4 of the National Electricity Law (NEL) sets out the functions and powers of the Australian Energy Market Commission (AEMC). Under Division 5 of Part 4, the AEMC has the power to conduct a review into the operation and effectiveness of the National Electricity Rules (NER).

² AEMO, *Energy Supply Outlook*, June 2017, p. 3

transmission network and a reliable distribution network.³

An adequate supply of dispatchable energy, or “energy reliability”, has to date been provided in the NEM through investment and disinvestment decisions by market participants on the basis of market signals: expectations of future spot prices and the need for investors in new capacity to enter into contracts to hedge against future price risk.

Specifically:

- In the short term, the spot market provides direct price signals for market participants to provide (or not provide) energy supplies. The reliability standard⁴ supports this in being an ex-ante planning standard which planning and operational processes undertaken by AEMO must seek to satisfy. The reliability settings⁵ form the key price envelope within which the wholesale spot market seeks to balance supply and demand, and deliver capacity to meet the reliability standard with the aim of avoiding unreasonable risks for market participants.
- In the longer term, the contract market, settled by reference to the spot market allows market participants to manage exposure to the spot market.⁶ The contract market has been an integral part of the NEM market design since its inception, contributing to reliability in a number of ways. A liquid contract market provides longer-term price signals for market participants to make efficient investment and retirement decisions in energy supplies by providing information on expected future market prices as well as providing a mechanism through which new generation can be financed. This in turn, contributes to the long-term reliability of the NEM.
- The contract market also assists with reliability in the short term, since market participants’ contract positions will affect operational incentives decisions to provide (or not provide) energy supplies e.g. a generator’s contract position will drive maintenance decisions, as well as its offers into the wholesale market.

Objectives of the Review

This Review will provide recommendations to the COAG Energy Council on any changes required to the regulatory and market frameworks required to maintain the NEM’s existing high reliability performance, even as the electricity system transforms to accommodate more intermittent generation and a larger presence of demand-side resources, including demand response.

³ A reliable power system is also one which is in a secure operating state, that is, one where the power system is in, or can be returned to a satisfactory operating state within 30 minutes.

⁴ The reliability standard for generation and bulk transmission sectors applies in the NEM where the standard is set in terms of the maximum expected unserved energy (USE), which refers to the amount of electricity that is demanded by customers but not able to be supplied. The current reliability standard is 0.002 per cent USE.

⁵ The reliability settings are four price mechanisms: the market price cap, the cumulative price threshold, the administered price cap and the market floor price.

⁶ Although contracts can take a number of different forms – both in the structure of the contract, as well as the time frame.

Box 1: Reliability in the NEM

Reliability of the system is maintained through market participants making efficient investment and retirement decisions, resulting in – at a particular point of time - a certain level of dispatchable energy sources, such as dispatchable generation (e.g., gas, hydro and coal), dispatchable load (e.g. large smelters, or demand response), interconnectors and storage. Variable, intermittent generation is, by definition, not dispatchable, i.e. while market participants may decide to invest in these sources, it is not guaranteed to be available to respond to demand when needed due to the variable nature of the resources that power it.⁷ The changing generation mix, characterised by increasing penetration of non-dispatchable variable generation as well as the recent exit of thermal generators, needs to be considered for the implications it could have on maintaining reliability of the system, particularly on extreme weather days.

The NEM has historically been a supply-dominant system with little demand-side participation. However, technological innovation is making the functions performed by distributed energy resources cheaper and more accessible to a wider range of users, resulting in increased investment in and so uptake of distributed energy resources, which is changing the way demand-side resources have traditionally interacted with the market. Key regulatory reforms have assisted in this, most notably new rules to support cost-reflective network pricing and competition in metering. Given these developments, demand response is being used more and more and could potentially be used to provide reliability reserves as well as being a substitute for peak capacity.⁸

Scope of the Review

As noted, a reliable power system has a number of components including efficient investment and retirement decisions by market participants resulting in an adequate supply of dispatchable energy, a reliable transmission network and a reliable distribution network.⁹ This Review will focus on, the investment and disinvestment by market participants to result in an adequate amount of dispatchable *energy* supply. It is important to note that the Review is focused on both the supply of dispatchable *energy* i.e. both generation and demand-side (e.g. demand response) sources of energy. The reliability of transmission and distribution networks is outside of the scope of this Review.

The Review will assess both existing, as well as potentially new, capacity and spot and contract price elements of the reliability framework, as shown in Figure 1, as well as considering how these elements could address reliability in both the short and long term. The Review will examine the regulatory and market frameworks associated with reliability in a holistic manner, and in the context of the NEM's existing industry structure and drivers of reliability frameworks (spot prices and the contract market). It will aim to identify the changes to the existing reliability frameworks that are needed to better allow for efficient investment and retirement decisions to be made, ultimately resulting in an adequate supply of dispatchable energy.

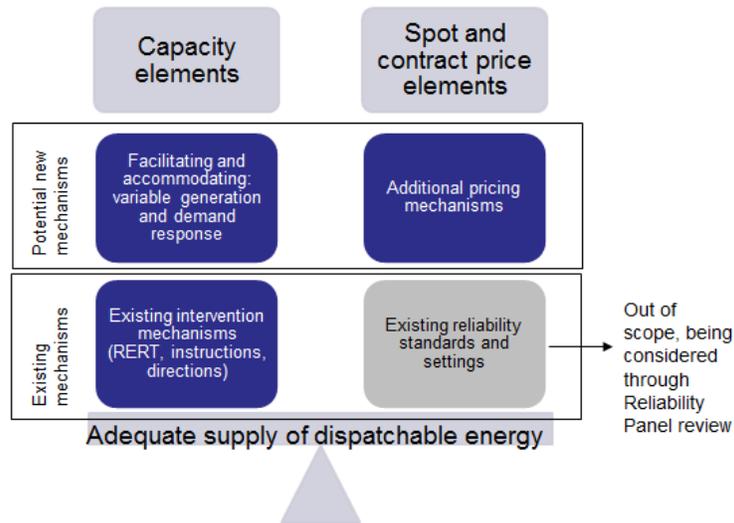
⁷ Finkel Panel, *Independent Review into the Future Security of the National Electricity Market: Blueprint for the Future*, June 2017, p. 76

⁸ A demand response initiative for reliability purposes is currently being trialled by the Australian Renewable Energy Agency and AEMO.

⁹ A reliable power system is also one which is in a secure operating state, that is, one where the power system is in, or can be returned to a satisfactory operating state within 30 minutes.

The existing reliability standard and settings are outside of the scope of this Review as they are already being considered in a review conducted by the Reliability Panel (Panel).¹⁰ The AEMC will work closely with the Panel and the Panel’s findings, where relevant, will inform this Review process.

Figure 1 - Scope of the Reliability Frameworks Review



In particular, the Review will assess the following existing intervention mechanisms for delivering an adequate supply of dispatchable energy:

- lack of reserve (LOR) and low reserve conditions (LRC)
- clause 4.8.9 instructions and directions
- reliability and emergency reserve trader (RERT).

The Review will also consider:

- how to better facilitate variable generation and demand response, including:
 - how existing variable generation could be made firmer (i.e. controllable) in the future, the role of demand response, storage and interconnection in facilitating additional sources of flexibility for intermittent generation, and how it can be used as a substitute for peak capacity.
 - how, and what, mechanisms could be used to make sure there is adequate investment and disinvestment, resulting in sufficient dispatchable energy present in each region, including mechanisms that facilitate demand response in the wholesale market.
- if the Reliability Panel’s analysis in the *Reliability standard and settings review* suggests it is necessary to do so, whether there are any other additional structures or fundamental

¹⁰ The Reliability Panel’s review may be found here: <http://www.aemc.gov.au/Markets-Reviews-Advice/Reliability-Standard-and-Settings-Review-2018>

changes that could be made to the reliability settings that would provide better or higher price signals of when there are shortfalls of reserves to try and better incentivise investment and operation decisions.

The Review will also incorporate, and be informed by, any existing work or recommendations that relate to reliability, including recommendations from the Finkel Panel that are within the scope of the Review, such as:

- the recommendation of a Generator Reliability Obligation
- the need for a Strategic Reserve to act as a safety net in exceptional circumstances as an enhancement or replacement to the existing RERT mechanism
- the suitability of a 'day-ahead' market
- a mechanism that facilitates demand response in the wholesale energy market.

The Review will also take into account learnings from existing initiatives such as the demand response pilot program being trialled by Australian Renewable Energy Agency (ARENA) and AEMO, and any other trials that ARENA and AEMO may undertake through their MOU that are relevant to reliability.¹¹

Outputs

The AEMC will publish an issues paper as a basis for initial stakeholder consultation in late August 2017.

A progress update will be provided to the COAG Energy Council prior to its meeting in December 2017 and the final report provided to the COAG Energy Council in June 2018.

Rule change requests or other reviews related to the subject of the Review may be received by the AEMC while the Review is progressing. The Review will be progressed concurrently and in coordination with the assessment of these rule change requests. Any forums, meetings and workshops held as part of the Review may also be used to progress the assessment of the rule change requests, subject to the statutory rule change process requirements being met.

Key principles

The AEMC will conduct this Review in accordance with the following principles:

- The AEMC will be guided by the National Electricity Objective, specifically: *to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to – price, quality, safety, reliability, and security of supply of electricity; and the reliability, safety and security of the national electricity system.*

¹¹ The initiative is a three-year pilot program seeking to provide 160 MW of reserve capacity through demand response. Those successfully enrolled in the program will join AEMO's short notice RERT panel and AEMO would call upon them if operating reserves in the NEM fall to critically low levels. The pilot is essentially a trial of demand response as a reliability mechanism. More information about the pilot program may be found here: <https://arena.gov.au/funding/programs/advancing-renewables-program/demandresponse/>

- This work will coordinate, where possible, with work being undertaken by AEMO, the Reliability Panel and the Australian Energy Regulator (AER). It will also take account of related work being done by other organisations on reliability and the NEM blueprint published on 9 June 2017 by the Finkel Panel Review.
- Solutions will be developed to account for linkages between the different reliability challenges and the interaction of those solutions with other aspects of the existing market and regulatory framework.
- Any solutions will, to the extent possible be technology-neutral and take into account the full range of potential network and market solutions.

Collaboration with other market bodies and stakeholders

- The AEMC will collaborate with ongoing work on issues relevant to the Review, being undertaken by the AEMO, the Reliability Panel and the AER through the Commission's development of proposals and recommendations arising from the Review.
- The AEMC will provide regular updates on the progress of the Review to the Market Bodies Forum (MBF)¹² to allow a strategic, whole-of-system perspective to be considered.
- A Reference Group comprising senior representatives from the AEMC, AEMO, the Reliability Panel, the AER and the Senior Committee of Officials (SCO) will be established by the AEMC to provide high-level input on the work of the Review and related reliability matters.
- The AEMC will establish a Technical Working Group to provide advice to the work of the review. In addition to the AEMC, AEMO and the AER, the group will include representation from:
 - conventional generators
 - renewable generators
 - retailers
 - energy service providers
 - consumers
 - transmission network businesses
 - distribution network businesses.

¹² The Market Bodies Forum is the coordinating body for Australia's east coast energy market institutions. For more information, see: <http://www.aemc.gov.au/News-Center/What-s-New/Announcements/Memorandum-of-Understanding-to-establish-Market-Bo>