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Reliability Panel
C/o Australian Energy Market Commission
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Sydney South NSW 1235

Submitted by email to aemc@aemc.gov.au

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Reliability Standard and Settings Review 2018

Snowy Hydro Limited welcomes the opportunity to comment on matters raised in the Issues Paper from the Australian Energy Market Commission (AEMC) on the Reliability Standard and Settings Review 2018.

Snowy Hydro Limited is a producer, supplier, trader and retailer of energy in the NEM and a leading provider of risk management financial hedge contracts. We are an integrated energy company with more than 5500 megawatts (MW) of generating capacity across New South Wales, Victoria and South Australia including the iconic 4100MW SnowyMountains Hydro-electric Scheme. We are one of Australia's largest renewable generators, the third largest generator by capacity and the fourth largest retailer in the NEM through our award-winning retail energy companies - Red Energy and Lumo Energy. Through our retail business, we serve more than one million customer accounts in the NEM including households, Small to Medium Enterprises (SMEs) and Commercial and Industrial customers (C&I) across Victoria, New South Wales, South Australia and Queensland. Snowy Hydro Limited also operates utilities connection business DirectConnect.

Snowy Hydro supports the current framework for the current reliability standard and settings in the National Electricity Market (NEM) for maximum unserved energy as the reliability standard with the Market price cap (MPC), Market floor price (MFP), Administered price cap (APC) and Cumulative price threshold (CPT). However we believe there are inconsistencies in the approaches used to determine the MFP. With the MFP unchanged since December 2000 and intermittency becoming more prevalent it is appropriate for the MFP to have an analogous methodology to that applied to the MPC. Snowy Hydro strongly recommends indexing the MFP to a lower value in line with the indexation of the MPC.

National Approach

Australia has undergone a number of policy changes over the past 10 years. This has resulted in a mismatch of Commonwealth and state policies, and a lack of integration of climate change policies with energy policies. This has led to distortions to investment signals and the market which has resulted in the energy industry not being able to anticipate the

necessary changes so as to make appropriate investment decisions to achieve a secure, reliable energy market. The numerous carbon and energy policies initiated by individual jurisdictions are resulting in increased cost and higher risk for energy users and are challenging the integrity of the NEM. Snowy Hydro therefore advocates a national and integrated approach to climate change policy as state based renewable energy targets put the stability and security of the electricity power system at risk in the absence of complementary dispatchable and non-intermittent generation.

The investment in generation required by the industry cannot occur without credible and enduring national energy and climate policy. With the energy industry's investment focus shifting to a combination of firm lower emissions gas generation, renewables and enabling technologies, more than 2,000 megawatts of firm generation exited the market in Australia last year.

Snowy 2.0 would help the NEM transition to meeting Australia's commitment to reduce emissions by 26 per cent to 28 per cent of 2005 levels by 2030 and maintain reliability. The 2,000MW of additional, dispatchable, and flexible hydro generation would play a key enabling role to support the increase in penetration of intermittent generation such as wind, rooftop PVs, and large-scale solar. Additionally this additional hydro generation could provide ancillary services such as inertia and spinning reserve which are not available from asynchronous generation from wind and solar.

Reliability Standard

Snowy Hydro believes that the current level of expected unserved energy (USE), in megawatt hours (MWh), should not exceed 0.002 per cent of the total energy demanded per region, in any financial year. In 2016 the Panel concluded that the existing level of standard (0.002 per cent of USE) remained broadly consistent with AEMO's measure of the value of customer reliability (VCR).

AEMO recently modelled¹ the impact of "*short-term withdrawal*" generators returning to service in 2017-18 to aid in reducing USE. Snowy Hydro notes the short term withdrawn generation plans listed to return as part of a market response in the ESOO have either returned to service or are planning to return to service². Figure 1 shows that if a combination of these withdrawn generators return to full service, USE is projected to reduce below the reliability standard in both South Australia and Victoria. We therefore believe that the USE figure should not change.

¹ AEMO, 2016, Update Electricity Statement of Opportunities for the National Electricity Market, November 2016

² The generators returning to service include:


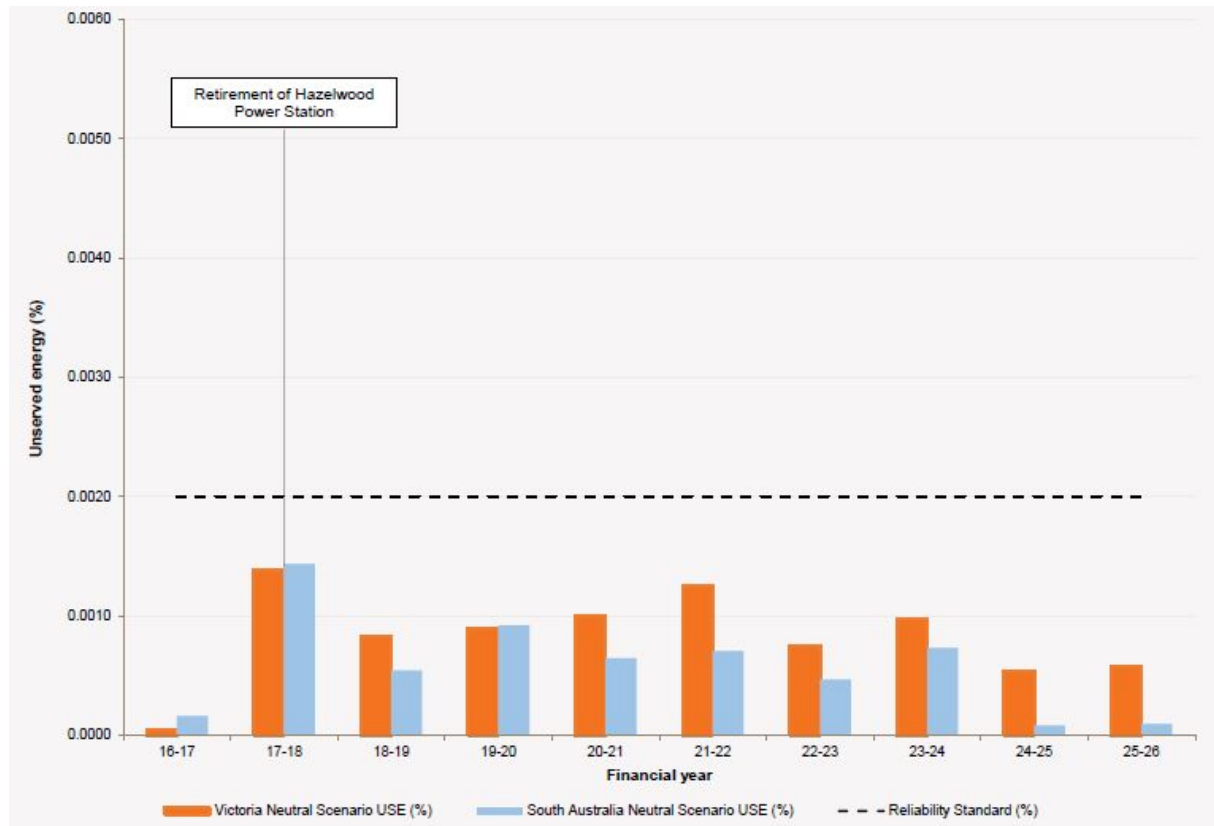
- Pelican Point Power Station in South Australia back to full service (239 MW).
 - Tamar Valley Power Station in Tasmania (208 MW).
 - Swanbank E Power Station in Queensland (365 MW).
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Figure 1: Victoria and South Australia supply adequacy with market response



Source: AEMO, 2016, Update Electricity Statement of Opportunities for the National Electricity Market, November 2016

To date the reliability standard has essentially been met. Snowy Hydro does not believe the design of the NEM needs to change. The energy-only market has been robust and delivered the required levels of generation investment, system reliability and security. The decentralised decision making in the NEM has ensured investments have been prudent. We do not support moving to a Capacity Market.

Market Price Cap, Cumulative Price Threshold and Administered Price Cap

Snowy Hydro submits that the MPC which is currently set at \$14,200/MWh should remain indexed to movements in the consumer price index (CPI) each financial year. The CPT should remain at 15 times MPC and the APC set at \$300/MWh.

The AEMC Issues Paper highlights that *“with the exception of 2015-16, the number of times the market price cap has been reached in the national electricity market has increased year-on-year since 2011-12 with the highest number of market price cap events in the 2016/17 year to date occurring in South Australia”*³. Snowy Hydro submits that the 2016/17 price cap events are driven by firm generation retiring as an increasing amount of

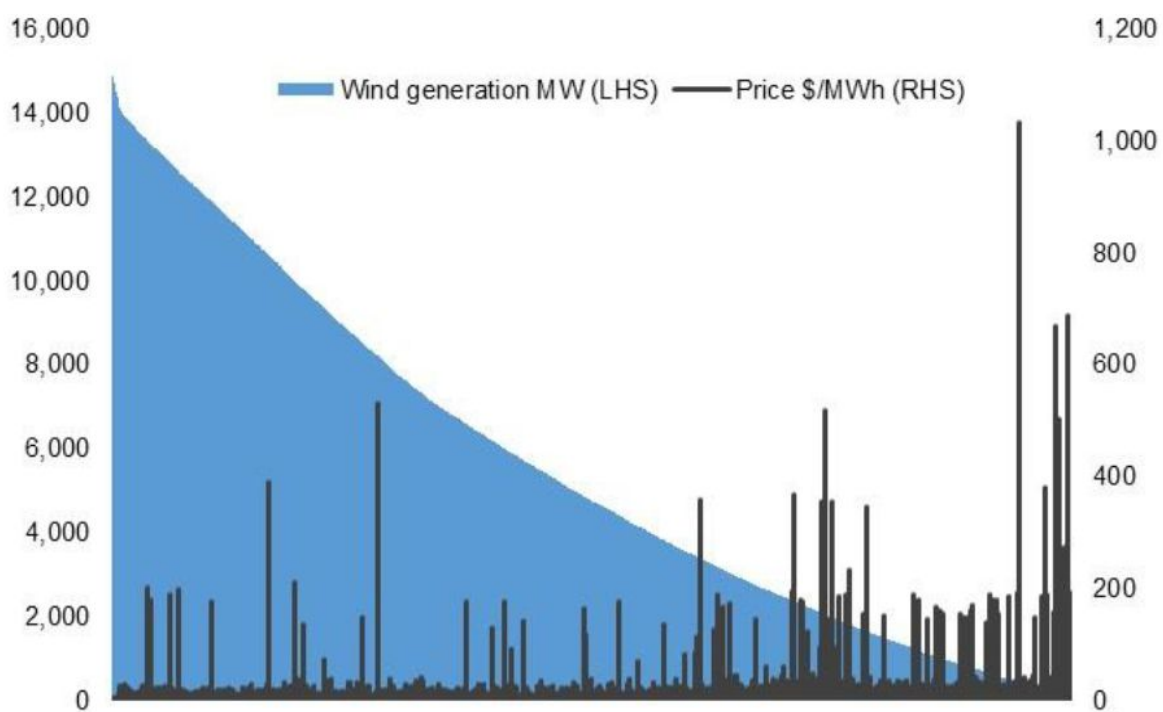
³ Reliability Panel, Reliability standard and reliability settings review 2018, Issues Paper, 6 June 2017

intermittent generation comes into the market, the need for expensive short-term generation to fill supply gaps, and the absence of national energy policy certainty.

Most recently, wholesale prices have jumped as a result of the closure of the Hazelwood Power Station in Victoria. It was the latest in a series of baseload power station closures that over time have impacted all states across the NEM. There is now less firm capacity available, not just within Jurisdictions but also for export to other states. The inclusion of Snowy 2.0 would add firm generation back into the grid and will likely minimise the incidence of market price cap events.

The wholesale market pricing signals provides important information to investors about when and where new generation is most valuable. For example, South Australia is showing signs that the region is saturated with wind generation (Figure 2 below). It is essential to preserve this feedback between demand and supply to ensure efficient investment.

Figure 2: South Australia’s wind generation by trading interval and price, 2016



Source: NEM Review 2017, market data.

There is no evidence to suggest that the MPC at its current levels will not provide the incentives for new investment in the NEM when it is required. All available evidence shows that the MPC has been a signal for new investment which has allowed the reliability standard to be met without AEMO intervention ie. Directions and the use of the RERT.



The cumulative price threshold provides a safety net for the NEM to ensure the financial stability of the market. Since market start the CPT has only been activated on 5 occasions which provides a clear indication that it is set at the right level.

The administered price cap is set at a level that maintains incentives for suppliers to provide energy in an administered price period. The Short Run Marginal Cost of generators are in general at or below the \$300/MWh level. Hence we are supportive of leaving the administered price cap at \$300/MWh for all periods when there is an administered price period.

Market Floor Price

In 2014, to assist the Panel in its review, ROAM consulting were engaged to undertake market modelling. Snowy Hydro believes ROAM’s analysis, which indicates that the current MFP is approximately at the right level, continues to be appropriate. Table 1 below shows the range of MFP required within each cycling class for one hour cycling to be beneficial.

Table 1: Market Floor Price Requirement for 1 Hour Cycling

Cycling Class	Minimum MFP	Maximum MFP
Small sub-critical coal	-594	-299
Large sub-critical coal	-758	-342
Supercritical coal	-674	-444
CCGT	-240	-81

Source: ROAM Consulting, 2014, “Reliability Standard and Settings Review”

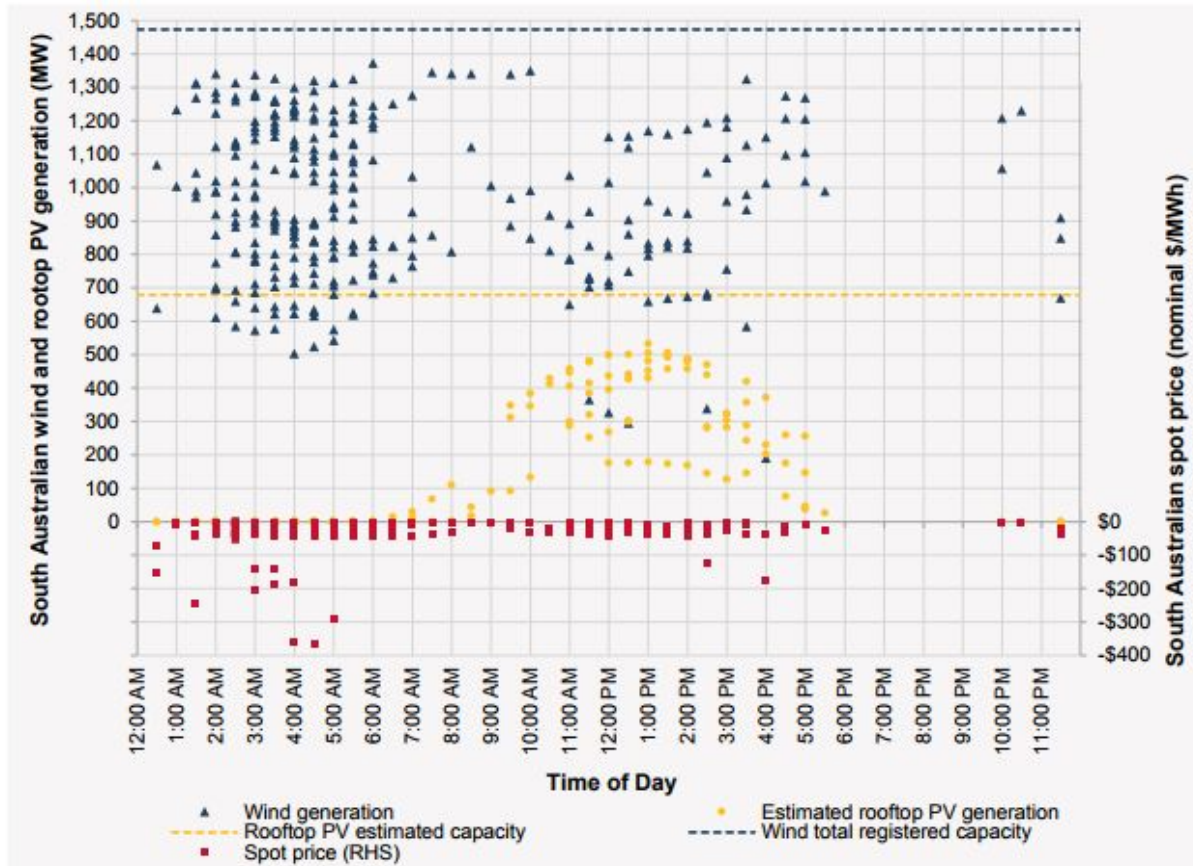
We are however concerned that there are inconsistencies in the approaches used to determine the MPC and the MFP. With the MPC the aim was to derive a price that would make a new entrant gas turbine viable when a NEM region experiences 0.002 per cent unserved energy. Whereas the MFP analysis was based on the marginal cost cycling.

The AEMC highlights that “*there has not been a clear increasing trend in low price events driven by an excess of generation*”⁴ which the AEMC suggest would not merit in re-examination of the MFP level. With more intermittent generation coming into the market Snowy Hydro expects intermittency to become more prevalent. At times of high wind, intermittent technologies continue to run even if there is excess generation. South Australia, which is sourcing almost half of its electricity from intermittent generation, was the state which achieved the highest frequency of low price events in 2016. A lower market floor would be required to allow more efficient signaling of the cost of cycling. We note that the MFP has been -\$1,000/MWh since December 2000 despite significant changes in the energy market.

⁴ Reliability Panel, Reliability standard and reliability settings review 2018, Issues Paper, 6 June 2017

The increased intermittent generation will require the MFP to be progressively negative so as to allow economic cycling. Figure 3 below shows the time of day and wind generation level for negative spot prices for South Australia in 2015-16. Most negative spot prices occurred when wind generation was relatively high, or during the middle of the day when high wind generation coincides with rooftop PV generation at the peak of daylight hours.

Figure 3: Negative South Australian spot prices, average wind and rooftop PV generation by time of day (2015-16)



Source: AEMO, 2016, “South Australian Renewable Energy Report”, December 2016

The large potential hourly variation of wind means firm generators will be required to more frequently cycle for short intervals. In 2011 AEMO NTNDP⁵ analysis examined the potential variability in hourly rates of change from wind and demand in 2019-2020. The report found very large potential hourly variation of 3,798 MW which meant thermal generators may be required to more frequently cycle for short intervals. The analysis although dated supports the view that the MFP needs to be sufficiently negative to allow economic cycling.

⁵ AEMO 2011 National Transmission Network Development Plan (NTNDP)

Figure 4: Variability in hourly rates of change from wind and demand in 2019-2020

	QLD	NSW	VIC	South Aus	Tas	NEM
Maximum hourly increase (wind)	0	375	590	914	604	1517
Maximum hourly decrease (demand)	697	1153	930	347	372	2281
Maximum hourly variability (wind & demand)	697	1528	1520	1261	976	3798

Source: AEMO 2011 National Transmission Network Development Plan (NTNDP)

If the MFP was raised to a higher value it would not allow generators with higher cycling costs to continue to operate during periods of low demand. Generators would have to incur high cycling costs which is inefficient because cheaper (low cycling cost plant) would have been prepared to cycle instead of paying the MFP if the price was more appropriately set at lower (more negative) value. Alternatively, if the MFP is insufficiently low, the higher cost cycling may declare itself unavailable instead of incurring high cycling costs. This would not be an efficient outcome as plant with high cycling costs also provide essential ancillary services such as synchronous inertia which is required for system security and reliability as the market becomes increasing more variable with intermittent generation plant.

Snowy Hydro also supports an analogous methodology to that applied to the MPC for the determination of MFP. This would entail assessing what level the MFP has to be to encourage new entrant technologies that could alleviate excess generation. These technologies may be pump storage, storage batteries etc. The concept is that the MFP has to be sufficiently low to provide an appropriate pricing signal to these new entrant technologies.

Additionally, to avoid generation being constrained off and as a result not being able to sell hedge products, the MFP will need to be lower if the MPC was to continue to increase due to CPI.

For all the reasons outlined above, Snowy Hydro strongly recommends indexing the MFP to a lower value in line with the indexation of the MPC.

Modelling for the Review

Snowy Hydro believes that if modelling is undertaken for this review it should consider the increasing levels of intermittent output, the current environment of higher gas prices and the interaction between prices and demand.

The modelling undertaken in 2010 included the existing and committed generation, forced and planned generator unit outages, energy projections; and network constraints. We are concerned that the 2010 report did not include the removal of firm generation and the significant increase in intermittent generation.

We also note the findings of Oakley Greenwood's Assessment of Approach to Market Modelling report, and agree that future modelling needs to be revised to cater for recent changes in the market, such as the reduction in surplus due to the closure of Hazelwood



Power Station, and anticipated market changes such as the outcome from the Finkel Review, increased penetration of batteries behind the meter, and possible wholesale market design changes such as an inertia ancillary services market.

Snowy Hydro appreciates the opportunity to respond to the Issues Paper. Any questions about this submission should be addressed to Panos Priftakis, Regulation Manager, by e-mail to panos.priftakis@snowyhydro.com.au.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'K Ly', with a stylized flourish underneath.

Kevin Ly

Head of Wholesale Regulation

