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Wednesday, 20 September 2017

John Pierce
Chairman
Australian Energy Market Commission
Lodged Electronically

Dear Mr Pierce,

RE: EPR0060 Reliability Frameworks Review Issues Paper Submission

The Clean Energy Council (CEC) is the peak body for the clean energy industry in Australia. We represent and work with hundreds of leading businesses operating in solar, wind, energy efficiency, hydro, bioenergy, energy storage, geothermal and marine along with more than 4,000 solar installers. We are committed to accelerating the transformation of Australia's energy system to one that is smarter and cleaner.

The National Electricity Market (NEM) is currently undergoing unprecedented change with the advent of low-cost renewable energy and increased investor appetite for renewable energy over conventional generation technologies. At the same time, the thermal coal generation fleet is quickly ageing and many of these assets are entering their twilight years with 70% of the existing coal generation assets reaching 50 years old between now and 2030.

Failing to appreciate and prepare for these changes will be at the detriment of supply reliability. However, the AEMC needs to take care not to punish new entrant generators because the owners of older and uncompetitive thermal generators shift these plants to the right hand side of their balance sheets. Overall, the NEM and associated financial markets have been designed around specific generation plant characteristics including hydro, gas peaking plant and inflexible and 'lumpy' thermal plant. It should not be assumed that requiring new generation plant with differing characteristics to fit into these arrangements is in the long-term interest of consumers.

The CEC welcomes the opportunity to respond to this review. As highlighted in the AEMC's Issues Paper, this shift in investor appetite towards renewable energy is an opportunity that the AEMC's work should be seeking to enable. The benefits of the transition away from a

reliance on expensive and volatile fuel prices for generators towards generation that has no fuel cost are significant, and will secure lower system-wide costs in the long term.

New market designs and models should be considered to ensure the long-term interest of consumers is advanced. This submission outlines the CEC's concerns and principles as they stand in relation to the AEMC's questions. We are working alongside our members at present to identify alternative market models that could be considered in this review and may submit a more refined proposal in the coming weeks.

We thank the Commission for the opportunity to provide our views on these matters and would be more than happy to meet and discuss the above proposal at a convenient time. Please contact the undersigned or Emma White (03 9929 4107) for any queries regarding this submission.

Sincerely,

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Recommendation 1: The AEMC should focus on flexibility over 'dispatchability'

The AEMC has set out two potential options for ensuring reliable supply, namely by bringing more dispatchable capacity into the market, or increasing the diversity of flexible sources of energy which can accommodate fluctuations in supply.

We believe that only the second option of providing increased flexibility into the market is viable because this option aligns more closely to the National Electricity Objective (NEO) as

- Enabling increasing contribution from flexible renewable energy sources will have long-term benefits of reducing system-wide fuel costs and exposure to volatility in both fuel (mainly gas and coal) prices and supply
- Flexible resources such as battery storage and pumped hydro have high capital costs but low operating costs and therefore provide low cost flexible solutions in the long-term that will enable a lower energy cost system
- Available evidence suggests that there are significant savings to be made by the proper integration of demand management from a wholesale market and network investment perspective
- Customers' investment in Distributed Energy Resources (DER) enables the market to utilise assets which are not looking to recover all costs from the wholesale market

The interplay with renewable energy sources and these flexible solutions would lead to reduced wholesale prices and reduced costs to consumers in the long-term. The alternative (encouraging more dispatchable generation) would likely do the opposite by committing new gas generation to the NEM or extending the life of ageing and increasingly unreliable coal resources. Both options commit consumers to higher and more volatile prices in the long-term.

The AEMC needs to consider the adequacy of the NEM's arrangements to ensure investment in the generation and energy sources that will best assist in achieving the goals of delivering a more flexible electricity market and enabling growth in renewable energy.

Recommendation 2: The AEMC should focus on encouraging flexibility in the NEM to ensure flexible energy resources deliver or consume energy in balance with VRE

There are options to increase flexibility through changes to market design in markets with high levels of renewable energy. International studies have shown that there are common factors which contribute to and support a flexible market. These factors include having a large balancing area and interconnected market, as well as encouraging a fast energy

market, where fast scheduling and dispatch allows the market to access physical flexibility that would be otherwise unavailable[1]. The NEM already has these characteristics, with a near-real-time energy market expected to be enhanced by the recent draft determination to move to a five minute settlement period. These factors are considered key to supporting more flexible energy solutions and promoting more effective demand side participation.

There is then a question of how the NEM market design can be improved to ensure adequate physical flexibility in the system can be accessed. One potential method is to provide an ancillary market for reliability services which values flexibility. International comparisons have outlined that there are two other market design principles found to increase flexibility in this context, namely resource-neutrality and performance[2].

A resource-neutral market allows all technologies to be equal competitors in an ancillary services market, dependent upon their ability to contribute to reliability[3]. A number of criteria could be used to define a reliability ancillary service product, such as response speed or accuracy of response. A payment for this type of ancillary service product should be based on performance. For instance in the United States, "FERC Order 755 details the rationale for 'resource-neutral' and 'performance-based' payment and removed the previous "unjust, unreasonable, and unduly discriminatory or preferential rates that resulted in economically inefficient dispatch of frequency regulation resources"[4].

Additionally, a market structure that is designed to incentivise demand response is likely to lead to better outcomes in the NEM. A market design to take advantage of demand response should emphasise performance criteria, such as ramp rates, accuracy and notification periods. Further, it should look beyond a reliance on emergency reserve mechanisms and encourage demand response into the day-to-day operation of the market.

[1] Milligan M, Frew B, Zhou E & Arent D. 2015. Advancing system flexibility for high penetration renewable integration, Technical Report NREL/TP-6A20-64864, National Renewable Energy Laboratory, USA.

[2] Milligan M, Frew B, Zhou E & Arent D. 2015. As above.

[3] IRENA. 2017. Adapting market design to high shares of variable renewable energy, International Renewable Energy Agency, Abu Dhabi.

[4] Milligan M, Frew B, Zhou E & Arent D. 2015. Advancing system flexibility for high penetration renewable integration, Technical Report NREL/TP-6A20-64864, National Renewable Energy Laboratory, USA.

Recommendation 3: The AEMC should focus its efforts on creating a framework that supplements the spot and contract markets and enables the introduction of more VRE in the NEM.

Core principles underpinning the NEM's contract market include the expectation of stable market conditions over the near to long term. The underlying assumptions that support this arrangement include predictable fuel costs and availability, predictable demand growth, competitive generation development, predictable electricity prices into the future and a predictable policy environment.

Some examples of trends include the deployment of over 6 GW of rooftop solar PV[5], which will continue into the future as consumers respond to increases in retail prices and act in their own best interests. Concurrently, demand growth, electricity prices and gas prices have becoming increasingly challenging to predict. Policy uncertainty and the looming threat of government intervention to prop up generation beyond its safe operating age or investing in pumped hydro introduces significant risk for new contracts.

Given all these factors it is not possible to equate the introduction of VRE as the driver of low liquidity in the contract market. These complexities have made forecasting contract prices effectively high-risk and of questionable bankability. As a product, swaps and caps are simply cannot be founded on pre-existing norms: high average electricity prices do not seem to be providing the certainty needed.

Despite this there is clearly investment in renewable energy and absent the Renewable Energy Target (RET) there has been little to no new generation investment in non-renewable generation. If there had been this would have only increase the exposure of consumers to high gas prices.

Increased uncertainty has a clear positive impact on contract prices and negative impact on liquidity. The viability of the energy only-market should be examined by the AEMC. Concurrently, the AEMC should also be considering whether the long-term interests of consumers will be advanced by advocating for the removal of 'externalities' such as the RET. Experience appears to suggest otherwise.

[5] http://www.cleanenergyregulator.gov.au/About/Pages/News%20and%20updates/NewsItem.aspx?ListId=19b4efbb-6f5d-4637-94c4-121c1f96fcfe&ItemId=417

The challenge the AEMC must address is around how to provide investment signals in a NEM that can ensure sufficient flexible resources are available when needed, while avoiding the introduction of major reforms such as a conversion to a capacity market. The AEMC's goal should be to seek out incremental market design changes that encourage an efficient level of investment in flexible physical capability which can respond rapidly when called upon. One option could be to implement a day-ahead market that balances uncertainty in the market's forecasting with flexible capacity. The CEC is considering such a mechanism with members and may submit this to the AEMC in the coming weeks.

The remainder of this submission provides responses to the AEMC questions.

CEC response to questions posed in the Issues Paper

Assessment principles

1a. **Do stakeholders agree with the Commission's proposed assessment principles?**

The CEC agrees that the focus should be on the development of appropriate market-based solutions that focus on the outcomes, not regulatory requirements.

Although centralised planning approaches (such as those in capacity markets) are not preferred, the NEM is not a significantly large market and it alone may not guarantee supply commitments. Some degree of centralised planning is likely to be appropriate in determining the flexibility needs of the market.

1b. **Are there any other relevant principles that should be included in the assessment framework?**

Whilst environmental objectives are not an element of the NEO, the AEMC should carefully consider its role in ensuring investment certainty when considering externalities, such as the Renewable Energy Target. The long-term interest of consumers will be met through efficient investment in electricity assets and schemes such as the RET are designed to support this outcome. Therefore, the AEMC should focus its efforts on enabling such schemes to achieve their stated objectives.

Assessment approach

2. **Are there any comments, or suggestions, on the Commission's proposed assessment approach?**

The AEMC's focus throughout the Issues Paper is on the role of dispatchable generation which minimises the role of renewable energy from a reliability perspective. Recent major supply interruptions have been the direct result of the dispatchable generators failing when needed. Some examples include operational decisions at the Pelican Point Power Station during February 2017 and unit failures at the Liddell Power Station on February 10 2017, amongst older examples such as the unexpected shutdown of Northern Power Station in 2003 and 2005. A more diverse generation fleet that has a larger number of smaller generators should provide more reliable supply, than large 'lumpy' generators.

Forecasting

3a. **What are stakeholders' views on the variances occurring in forecasting? Could these variances be minimised through more sophisticated forecasting techniques?**

Alternative models for forecasting accuracy could utilise incentives to increase accuracy. Such a scheme is applied in the United Kingdom for wind generation forecasting.

3b. **Are forecasting errors impacting on NEM reliability?**

As the penetration of renewable energy increases the need for accurate energy and resource forecasting increases. However, errors will always be present and market-base solutions need to work within this paradigm. The CEC recommends the further development of flexible market solutions to deal with the realities of forecasting error and provide AEMO with certainty that reliability impacts from forecasting errors will be avoided.

Options to accommodate intermittent generation

4a. **Do stakeholders consider that facilitating additional dispatchable generation, or facilitation of more flexible energy sources, or a combination of both, can more easily achieve the aims of better incorporating intermittent generation into the NEM?**

The AEMC should focus its efforts on the development of more flexible market arrangements with an aim to enable increased contributions from zero-fuel cost renewable energy. Greater utilisation of these resources will reduce system-wide costs and therefore advance the NEO, as compared to increasing the level of dispatchable generation.

4b. **What outcomes do stakeholders consider are necessary in order to better incorporate intermittent generation sources into the NEM, from a reliability point of view?**

The CEC does not see a need to adjust the current reliability frameworks at this point in time, and requests that the AEMC demonstrate any perceived issues (in line with the assessment framework).

4c. **What factors should be taken into account when considering a Generator Reliability Obligation?**

Market-based solutions that deliver flexible responses will promote the NEO. Regulated or mandatory approaches such as prescriptive Generator Reliability Obligations are likely to lead to inefficient investment. Where such a solution it must be supported by allowing contractual solutions that enable generators to determine how they meet the obligation, and afford them the power to use these assets in normal market operation.

Credible contingencies

5a. **Do stakeholders have any views on whether the existing credible contingency definitions may, or may not, be appropriate given the changing generation mix?**

The AEMC have highlighted the way in which a range of forecasting errors are triggering Loss of Reserve flags. However, forecasting errors are an operational issue, not a reliability issue. The market should accommodate the reality of forecasting with a high degree of certainty by moving forecast errors away from the contingency domain and into the market operations domain.

5b. **What are the differences in the impact of the changes in the generation mix on these definitions? Do these differ depending on whether they are thought of as relating to 'reliability' or 'security'?**

Forecasting error should not be treated as reliability or security. It is an operational issue that the market needs to adapt to.

5c. **In reviewing the appropriateness of these definitions, are there any particular principles or considerations that the AEMC should take into account?**

Preparing for credible contingencies is a planning issue. Forecast errors are operational and will always be present to some, and variable degrees. An operational solution is required to address forecasting errors, not the loss of reserve framework.

Interconnectors

6a. **What role can interconnectors play in relation to reliability?**

Greater interconnection clearly increases reliability as inter-regional trade can manage variability in demand and supply along with geographic diversity of renewable resources.

6b. **What factors should the Commission consider in this regard?**

The transmission investment framework is incapable of constructing infrastructure that will deliver benefits many years in the future, or enable a transition towards cleaner forms of energy. The regulatory investment test fails to account for significant infrastructure projects such as interconnectors, favouring minor transmission augmentations that provide short-term benefits. This framework makes it incredibly unlikely that any interconnection assets will be built through a RIT-T, without intervention of direct investment from government.

Absent a plan to address shortcomings in the RIT-T the AEMC should focus on enhancing the use of and markets for intra-regional generation, storage and flexible resources to manage reliability.

Contract market

7a. **Is generation and load becoming more capable of varying production and output in shorter timeframes, and if so, what will be the role of**

contracts? If generation and load could respond instantaneously to spot market signals, how would this change the contract market?

The physical characteristics of generation and demand are changing irreversibly. Although the materiality of this on the contract market are hard to deduce when there are clearly many other factors impacting this market (policy uncertainty, gas availability, generator closures) the viability of relying on an energy-only physical market should be examined by the AEMC.

7b. **The proportion of intermittent generation in the market is increasing. Caps and swaps have traditionally been sold by dispatchable generators which can turn on or off at will to 'back' their contractual obligations. How will the volume and type of contracts traded change as the generation mix evolves? Will this have implications for reliability?**

The CEC refers the AEMC to recent decisions with regards to the five minute settlement rule change. The AEMC should keep in mind that the contract market is an outcome of the NEM's design and generation characteristics, reforms that specifically prop up these arrangements may not be in the long-term interests of consumers. Other options that encourage investment in new generation may lead to better outcomes.

7c. **How significant is the demand-side in driving behaviour in the contract market?**

Contracts rely on stable, predictable conditions. Changes in the demand side reduce the level of predictability.

7d. **Over time, spot prices may become increasingly decoupled from domestic demand (as discussed in Box 6.3). More and more, spot prices may come to be driven by relatively unpredictable natural forces (like wind and sunshine), as well as by movements in international markets (like the demand for gas). How will this affect the role of prices in supporting reliability through domestic investment and operation?**

The CEC notes that in the Issues Paper the AEMC cite that wind and solar resources can be forecast with a high accuracy and are not 'unpredictable' technologies. Further, wind and solar are more distributed, reducing the impact of a plant outage on the market.

See previous comments on the viability of current arrangements.

External factors

8. **What external factors (that is, not the contract, or spot price) are influencing investment, retirement and operational decisions in the NEM?**

External factors have been key drivers for investment in the NEM. The structure of the NEM and NEO imply that environmental objectives simply cannot be met in the absence of these external factors. The market would being lower risk, provide greater certainty and allow more efficient investment, retirement and operational decisions if the AEMC focussed on enabling these external objectives. As previously these interventions have led to more

competitive energy prices and more diversity away from a reliance on gas market conditions.

Efficacy and efficiency of information provision

9a. **What is the potential for the reports (Energy Adequacy Assessment Projection, Electricity Statement of Opportunities and PASA) to be streamlined or made more efficient given existing interactions?**

No response.

9b. **Is the information provided by the reports adequate given that it has the purpose of information provision to the market for reliability and investment purposes?**

No response.

9c. **In particular, is the information around planned generation maintenance and outages adequate?**

No response.

9d. **What other information do stakeholders rely on?**

No response.

Role of interventions

10a. **What is the role of intervention mechanisms in the reliability frameworks? Does this role change in times of uncertainty?**

Intervention mechanisms should remain focussed on intervening when the market does not, or cannot deliver. Market-based solutions should be updated to ensure that competition and equilibrium pricing can deliver efficient outcomes for consumers. Interventions should remain a last resort.

10b. **To what extent do stakeholders consider that intervention mechanisms inhibit market-based responses, and create distortions within the framework?**

Clearly, investors and participation in contract markets will be deterred if the market operator is intervening frequently. Especially during times of scarce supply.

10c. **To what extent are interventions preferable to load shedding?**

'Load-shedding' should be made less probable by encouraging an efficient level of demand response.

Triggers for intervention

11. **Do stakeholders consider that there is sufficient transparency about the existing triggers for intervention?**

The Loss of Reserve notices approach is appropriate and the AEMC should focus on market development to reduce the likelihood of intervention.

Efficiency of the RERT

12. **Do stakeholders consider that the RERT is still a relevant mechanism to ensure a reliable supply of energy in the NEM?**

No response.

RERT procurement trigger

13a. **To what extent do stakeholders consider that the fact that AEMO can only trigger the RERT for anticipated shortfalls still appropriate?**

No response.

13b. **Is the procurement trigger still appropriate in a world where shortfalls are less predictable, and there in increased demand-side participation?**

No response.

RERT lead time

14a. **To what extent do stakeholders consider that the lead times for the RERT constrain the ability of market-based reserve contracts being realised?**

No response.

14b. **What are stakeholder' views on the need for the long-notice RERT?**

No response.

***14c.* Does the long-distance RERT have the potential to limit a market response?**

No response.

Price discovery

***15.* To what extent do stakeholders consider that the price discovery process of the RERT could be improved?**

No response.

Demand response and reliability purposes

***16a.* What are the reasons why most demand response providers have not participated in the RERT to date?**

The NEM has not encouraged demand response and the RERT has only recently emerged as a viable mechanism for demand response. Demand response providers should not rely on RERT. If a more active demand response market existed for normal market operations a larger demand response participant pool would be prepared to participate in the RERT.

***16b.* What findings can be taken from the ARENA-AEMO trial in terms of how demand response could be better incorporated into the RERT?**

No response.

Efficacy of directions and clause 4.8.9 instructions

***17a.* Are reliability directions fit-for-purpose given existing trends such as the start-up time of generating units and other trends such as higher penetration of variable, renewable energy in the NEM?**

No response.

***17b.* Are reliability directions and clause 4.8.9 instructions needed given the existence of the RERT?**

No response.

17c. **Is the notification process for directions – amount of notice given clarity – adequate?**
No response.