

13 October 2017

The Hon. Josh Frydenberg MP
Minister for Environment and Energy
PO Box 6022
House of Representatives
Parliament House
Canberra ACT 2600

Dear Minister Frydenberg

**ENERGY SECURITY BOARD (ESB) ADVICE ON A RETAILER RELIABILITY,
EMISSIONS GUARANTEE AND AFFORDABILITY**

The Board writes in response to your request for advice following AEMO's recent report on the risks to reliability in the electricity market. Specifically you requested advice on the changes needed to the NEM and legislative framework to ensure that the system provides reliable, secure and affordable electricity, and in particular, ensure that:

- The reliability of the system is maintained;
- The emissions reduction required to meet Australia's international commitments are achieved;
- The above objectives are met at the lowest overall costs.

You also requested advice on AEMO's recommendation for the development of a strategic reserve. AEMO advises that it is presently developing a design for a strategic reserve. The ESB recommends that this work continue and that its advice on a strategic reserve proceed after AEMO completes its analysis later this spring. We see the Strategic Reserve as a separate policy issue from the mechanisms outlined below and compatible with what follows.

The ESB notes that your questions were also addressed in the Finkel review and the ESB advice builds on the findings of the Finkel review with an emphasis on implementation. For a number of reasons, including most importantly, the presence of the Renewable Energy Target (RET), the falling costs of new renewable wind and solar supply, and customer preferences, Australia is seeing an unprecedented growth in renewable resources, both in front of and behind the meter. As AEMO and the AEMC have identified on various occasions there is a concern that while these variable resources support emissions reduction, there is also a need for system reliability and security.

Our advice adheres to the Finkel recommendations that changes to the market are necessary to ensure that the necessary level of flexible and dispatchable resources are maintained in the NEM. This is to assure reliable and competitively priced supply alternatives that will in turn promote affordability. Our implementation recommendations are calibrated to minimise disruption to the current market rules and arrangements, provide participants with the time and flexibility to meet the desired outcomes, and increase certainty in the NEM to promote greater and more efficient investment.



We believe the final design of the mechanism outlined below will benefit from market consultation and testing. Thus, to proceed with the required and appropriate urgency, we recommend that the ESB advance this recommendation to COAG in November with a view towards engaging with subsequent detailed design consultation thereafter. This would allow final approval of a rule change by year end 2018 with implementation in 2019 for the reliability guarantee and 2020 for the emissions guarantee.

ESB Advice

The wholesale sector of the National Electricity Market (NEM) operates through two separate but related components.

- (i) A wholesale spot market that matches supply from generators with demand from consumers.
- (ii) Longer term contracts between generators and retailers that match supply and demand. These contracts provide revenues to generators, wholesale price certainty to retailers and create a direct link between the financial viability of resources that supply energy and essential services to meet the physical needs of the system for reliability and security.

The combination of these two mechanisms promotes competition while recognising the real time features of the power system. To preserve these features any mechanism intended to maintain or enhance reliability and reduce emissions must be able to operate through these forms of contracts.

Retailers in the NEM are the participants with the primary power supply relationship to customers. Ultimately both the mix of resources required to meet reliability and emissions objectives is a function of consumer demand for grid based power. Retailers are in the best position to forecast and acquire the supply necessary to meet consumer demand. They therefore should carry the complementary obligation to acquire a mix of resources on the behalf of their customer demand that allows them to in turn supply electricity that is affordable, reliable and overall complies with National carbon emission goals.

The ESB is thus recommending the creation of a dual reliability and emissions guarantee. The reliability and emissions guarantee will place a requirement on electricity retailers to meet their load obligations with a portfolio of resources which include a minimum amount of flexible dispatchable capacity, and an emissions level consistent with Australia's international emissions reduction commitments. Retailers will fulfil their guarantee through the contracts they enter into with generators or through the type of generators they invest in directly. The dual guarantees will be imposed through the conditions of registration as a wholesale market customer in the National Electricity Rules. Like requirements will be imposed on large power users who participate directly in the wholesale market.

Framework for the Reliability Guarantee

The NEM reliability standard sets the maximum level of consumer energy demand which should be at risk of not being supplied in each region in any given year. This is currently 0.002 per cent of the annual consumption in a region. This planning



standard sets a long term target for reliability that represents a trade-off between price and reliability.

However, as outlined in AEMO's recent advice there is an increasing concern that there is currently insufficient incentive to both drive investment in new flexible, dispatchable resources and maintain existing such resources. This will be exacerbated in future years as current dispatchable generation (such as coal and gas) exits the market.

The ESB is proposing the development of an obligation on retailers to meet a percentage of their load requirements with flexible and dispatchable resources, that is, resources that can be scheduled by the market operator depending on the real time operating needs of the system. This would allow both new and existing generation to meet the dispatchability requirement, and provide a greater incentive to maintain existing plant which is necessary for the secure and reliable operation of the power system. The resources which comply with the system needs would be carefully defined and include any form of technology, generation, batteries and demand that can respond to a request by the operator to increase or decrease their output over a defined time interval.

This reliability guarantee would require retailers to hold forward contracts with dispatchable resources that cover a predetermined percentage of their forecast peak load. The amount and type contracted would be based on the system wide reliability standard as determined by the Reliability Panel at the AEMC. AEMO, in consultation with the Panel, would then determine how the NEM standard is translated into an operating requirement for each region. This operating requirement would set the minimum level and type of dispatchable capability the system requires. This could include fast start or slow starting but longer running resources, and would be determined given the expected load requirements of market customers in each region, the level of dispatchable and various resources and the interconnector capacity.

Retailers and large users would then be incentivised to enter into contracts with generation resources for a proportion of their energy obligations to be met by capacity that meets the dispatchability criteria established by AEMO. Clarity would be provided through the framework about what type of generation and load resources meet this requirement to allow retailers to enter into contracts for the development of resources that they can be confident will be valued in the market.

This approach supports liquidity in the contract market with contracts for dispatchable resources trading at a premium to less firm resources and providing a steady revenue stream for new and existing generation. One outcome is likely to be less spot price volatility as generators would be incentivised to be dispatched to meet contract obligations.

At the beginning of the compliance period retailers and large users would need to provide the AER with evidence that their contract positions met the need for dispatchable resources, or their reliability guarantee.

While based on a clearly defined standard that would facilitate market participants investment and forward contracting decisions, the actual requirement for flexible, dispatchable capacity would be dynamic, varying dispatch period by dispatch period as the generation mix, customer demand and network situation changes. Once the



mechanism is in place it is anticipated that AEMO would need to develop processes to inform the market as to the estimated requirement and dispatch that in real-time.

Compliance with the guarantee is then based on the actual output and availability of the dispatchable capacity and the cost of any non-compliance is based on the real time spot price. Ultimately any retailer that did not comply and consistently failed to comply would be deregistered from the market.

Many large retailers have a 'structural' hedge through their ownership of generation assets. This may mean that those generators readily meet or exceed their reliability guarantee. To the extent they were over-subscribed it would be expected that they would enter into contracts with retailers who needed additional resources to meet their obligations through existing mechanisms within the market. This would further support contract market liquidity. Moreover, for generators who do not have load, the guarantee will allow them greater opportunity to build resources and sell hedges to retailers. The guarantee mechanism will also incentivise variable generators to add storage to their mix of resources to create greater value for their output. Finally, customers who have flexible dispatchable demand, including solar and storage resources, will be able to participate in the short term hedge market, since their availability is generally not known until near to the delivery day.

The reliability requirements would necessarily be regional and ensure that each State contributes to maintaining reliability. The resources needed to ensure reliability will be of value and tradeable between regions within the interconnector constraints. This would allow regions with excess resources to benefit and avoiding the risk of some regions free-riding on others.


While this proposed guarantee is specifically devised to work with the NEM, it incorporates a number of elements in markets internationally. A number of international examples now incorporate markets or arrangements to ensure sufficient flexible ramping capacity is dispatched and structured arrangements to ensure systems meet operational reliability standards through the provision and dispatch of operational reserves is common.

Framework for the emissions guarantee

The emissions target would be set by the Commonwealth Government in line with Australia's international emissions reduction commitments and translated into a requirement to meet an emissions guarantee on retailers and large users to meet their load requirements at a certain average emissions level. Retailers would disclose how they have met their guarantee through either their contracts with existing generators or with generators to develop new capacity.

As with the reliability guarantee, retailers and generators would enter into contracts for the supply of energy at a certain emissions level. These contracts between the retailer and generators specify an amount of energy over a particular time (as at present), and also specify an emissions level at which that energy will be delivered. The generator will know the historical performance of its plant since it must assess this when entering into any existing contractual arrangements. This new guarantee simply includes as an additional parameter, its historical emissions level for each unit.

Retailers would then put together one or a range of contracts to meet their emissions guarantee. Some retailers will not be able to meet the required emissions profile, while others will overachieve. Therefore, a secondary exchange will occur between



retailers to balance their portfolios, again as happens now in the existing contract market. Generation purchased by the retailer from the spot market without a contract would be assigned with the average emissions level of the uncontracted generation capacity available to the market. Generators will always leave some spare capacity to ensure they cover their contract commitments and retailers typically attempt to fully hedge their load with a probability consistent with their tolerance for risk.

In order for retailers to show compliance with the guarantee, they would need to provide evidence to the AER that the mix of the electricity supplied has met the emissions guarantee for their served load over the compliance period. Compliance with the guarantee would be assessed against the actual output of the generation units with which the retailer has contracted. While the generator is incentivised to meet the emissions level given the contractual obligations agreed to with the retailer, if they fail to do so the retailer will be required to fill the gap within a specific time period. Persistent failure to close the gap would result in market deregistration.

Australian carbon credit units (ACCUs) and international units could be permitted to meet a proportion of the retailer's guarantee and banking and borrowing across the compliance period would be allowed to a certain level.

Like the reliability guarantee, the emissions guarantee would work with the contract market to support investment in both new and existing generation, with the extra demand for contracts providing the firm revenue source required to finance this investment.

The impact of this scheme should be a lower cost way to meet Australia's emission reduction targets because it applies to the whole market, allowing the lowest cost mix of generation technology to contribute to meeting the sector-wide emissions target. There are no subsidies or certificates involved in this guarantee and in this sense it does not involve a price or tax on carbon.

As in the case of the reliability requirement, the emissions guarantee in effect creates a portfolio standard that is similar to such standards created in international markets while also adhering to Australian market design approaches.

Interaction with the Large-scale Renewable Energy target (RET)

The guarantees are not intended to change the RET scheme. The RET is expected to be met by 2020 and finish in 2030. This should run its course. Once new investment under the RET finishes in 2020, the emissions guarantee on the retailers will require them to contract with low or zero emission generators to meet their guarantee but only where necessary to meet the emission reduction targets set by the Commonwealth.

Projects financed under the RET would be grandfathered from 2020, and would continue to earn certificates until 2030 as is currently legislated. The policy could determine whether retailers could use these generators to meet their obligations under the retailer reliability and emissions guarantee.

Emissions-intensive trade-exposed industries (EITE)

The guarantee could be designed such that electricity used to conduct EITE activities is exempt from attracting an emissions liability, as is currently the case. However, to ensure the sector achieved the emissions target, the liability from this electricity would have to be met by the rest of the sector.



State-based schemes

The guarantee could also be designed so that any state-based schemes would be included. Projects financed under state-based emissions reductions schemes up to the time of implementation would go towards meeting the national emissions reduction target. States with higher emissions targets or specific goals towards renewable energy development could be pursued independently but will not increase the National commitment, merely impact the geographic distribution. Further, the regional complementary reliability guarantee means that different State approaches do not impose additional costs on consumers in other States.

Expected price impacts

Under this scheme, the wholesale price would be expected to be lower relative to today and lower compared to a certificate-based scheme. Since retailers will need to contract with new low emissions and dispatchable generators, the increased supply will place downward pressure on wholesale prices. In addition, a greater level of contracting with existing generation including gas, coal or hydro, will encourage generators to invest in their existing plant and offer their capacity into the spot market at their marginal costs to ensure they are dispatched to meet their contract obligations. Further, if such a scheme were to remove policy uncertainty in the sector, it would reduce the risk premium associated with financing new projects.

An approach that does not subsidise a specific technology and instead allows a range of low emissions technologies to meet the overall target will lead to lower prices for consumers than would otherwise have been the case. In addition, an approach that incentivises contracting with, and values, both lower emissions and dispatchable capacity, will be expected to change the mix of different generation types in the system.


Certificate based schemes like the RET and the Clean Energy Target require liable entities to purchase certificates to meet their emissions obligations. Under the reliability and emissions guarantee, there is no certificate scheme required. Rather, compliance will be monitored and assured by the AER and any particular retailer that fails to fulfil the guarantee following an appropriate period would be deregistered.

It is expected that following the guarantee could lead to a reduction in residential bills in the order of \$100-115 per annum over the 2020-2030 period. Wholesale prices are expected to decline by 20-25% per annum over the same period. Compared to the Clean Energy Target as specified in the Finkel Review, this guarantee could be expected to lead to wholesale prices that are on average 8-10% lower over the 2020-2030 period. The Commonwealth has requested that the AEMC undertake detailed modelling of the Reliability and Emissions Guarantee to provide further information as part of the consultation process.

Governance framework

The reliability guarantee and the emissions guarantee will both be implemented via the contract positions of retailers and large users. As a result, the preferred governance approach recognises the linkage between the two guarantees and minimises the duplication of both regulatory and compliance requirements on participants.

The ESB proposes that the dual reliability and emissions guarantee be implemented following adoption by the COAG/COAG Energy Council agreement and through and



amendment of the National Electricity Law. The guarantees would form an additional component of the current energy governance framework. Under this option existing national energy market arrangements including the Australian Energy Market Agreement would be amended to introduce a new law, implemented by South Australia and applied in each of the other jurisdictions, similar to the NEL. There would be joint rules similar to the National Electricity Rules, and the AEMC would be the rule-maker and the AER responsible for compliance for the scheme.

Using this approach, the Commonwealth government would set the National emissions reduction target. The rules framework would translate the overall target into the individual retailer guarantees and establish the compliance framework. Embedding the mechanism into the broader energy governance framework allows the scheme to be fully integrated with the broader energy rules. This would maximise consistency between the reliability and emissions guarantees, reducing complexity and compliance costs for market participants.

In addition, establishing the process for any changes to the mechanisms involved in meeting the guarantees within the rules should give market participants more certainty that they will endure beyond any one term of government. It will also allow participants clarity into how and when revisions to the mechanisms will occur recognising that the design of the mechanism is already flexible to changing market dynamics. Certainty that the policy mechanism will last, along with a mechanistic and known approach to any updates, would increase the investor confidence and certainty needed in the electricity sector where the assets are long-lived and the planning horizons are lengthy.

In the case of emissions, while the target would need to be national, the approach and proportion of national emissions reductions required would be tailored to the NEM. This would allow a different emissions target and a different approach to be established for Western Australia and the Northern Territory if required.

Conclusion

The ESB considers the implementation of the reliability and emissions guarantee to be a valuable and necessary evolution of the NEM. Due to climate conditions and geographical size and diversity, Australia represents an excellent operating climate for variable renewable resources. These resources are an important component of a power mix that achieves Australia's emission targets. However, the value of these resources to consumers is directly compromised if it results in unreliable and unaffordable electricity. The reliability and emissions guarantee will establish clear and necessary policy signals for the retention and development of the complementary resources required in the NEM to achieve a reliable and affordable power supply that also meets Australia's emissions objectives.

It is anticipated that the detailed design and development of these dual guarantees for reliability and emissions would begin as soon as there is COAG agreement on the approach. The reliability part of the guarantee would be implemented as soon as practical and no later than 2019 following detailed work and consultation with market participants. An early introduction into South Australia could be considered given current concerns about reliability in that state.

The emissions guarantee would be implemented in 2020 to replace the RET with details of the immediate target and initial trajectory worked out as soon as practical. This trajectory would recognise both the current emissions position and the least cost



trajectory towards the Paris agreement undertakings, as relevant for the electricity sector.

In 2030 it is expected that the power mix of different types of generation would be in the order of 28-36% renewables (including hydro and solar pv); intermittent renewables would make up about 18-24% with dispatchable resources providing the remainder. The expected mix will also be analysed by the AEMC as part of the detailed modelling requested by the Commonwealth.

The ESB recommends that the operation of the scheme and the performance of the scheme in achieving all its objectives, be reviewed in 2025. The industry and technology will continue to evolve and customer behaviour will continue to change. The growth of distributed energy storage including battery storage and the participation of customers in energy markets in particular need to be monitored.

We look forward to continuing to work with the Commonwealth and States to implement the Finkel review including these required changes. Please do not hesitate to contact myself or other ESB members should you require further information.

Yours sincerely

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13 October 2017

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