Mr John Pierce
Chair, Australian Energy Market Commission
Level 6, 201 Elizabeth Street
Sydney NSW 2000

6 Feburary 2018

Re: EPR0060 – Reliability Frameworks Review Interim Report

Dear Mr Pierce

The attached paper sets out the Energy Efficiency Council's (EEC) response to the Australian Energy Market Commission's (AEMC) Reliability Frameworks Review Interim Report (hereafter referred to as the 'Interim Report').

Increased levels of demand response in the National Electricity Market (NEM) would significantly increase the reliability and affordability of electricity services. Demand response provides dispatchable capacity that significantly increases competition in electricity markets, and is particularly critical right now to given the increased proportion of electricity coming from intermittent generation and frequency of trips from some coal-fired generators.

All the available evidence suggests that the level of demand response in the National Electricity Market (NEM) is well below both the economically optimal level and the level seen in overseas markets (see section 1.2 of this submission). The low level of demand-side participation is caused by barriers that have been identified in multiple reviews, including:

- The 2002 *COAG Energy Market Review* led by Warkwick Parer AM;
- The 2012 *Power of Choice Review* undertaken by the AEMC; and
- The 2017 *Independent Review into the Future Security of National Electricity Market* led by Dr Alan Finkel AO.

The Parer Review's conclusion from 2002 is still one of the most succinct explanations of the problem (page 174):

> *"The Panel found that there is a relatively low demand side involvement in the NEM because:*
> - *the NEM systems are supply side focussed*
> - *the demand side cannot gain the full value of what it brings to the market*
> - *residential consumers do not face price signals."*

The EEC strongly recommends that the AEMC enact two recommendations that have now been made in multiple reviews and Parliamentary inquiries:

- The introduction a mechanism to allow consumers to sell their demand response capacity to a third-party and/or bid it into wholesale electricity markets; and
- Establishing a Strategic Reserve to provide capacity in emergency situations.

In 2016 the AEMC decided not to introduce a mechanism to facilitate demand response in the wholesale electricity market, despite recommending the introduction of a mechanism in 2012. The AEMC considered a number of factors in its 2016 decision that are discussed in Section 2.2 of this submission. However, a key factor in the AEMC's decision was modelling that was based on the assumption that the oversupply of capacity that existed in 2015-16 would continue for many years.

As we predicted in 2015, these conditions have not continued – a number of large generators have closed and the proportion of electricity coming from intermittent generation has increased substantially. As a result, the AEMC's decision to not introduce a demand response mechanism in 2016 likely contributed to higher wholesale prices that have already cost consumers tens or hundreds of millions of dollars. The changed conditions since 2016 make it essential that the AEMC now introduce a demand response mechanism.

An effective Strategic Reserve could have provided an additional buffer to the deteriorating demand-supply balance, and given consumers and governments confidence that the impact of supply shortfalls would be minimised. However, the absence of dispatchable capacity in both the wholesale electricity market and a Strategic Reserve has resulted in state governments taking *ad hoc* action to address voters' concerns. The South Australian Government recently spent $339 million on diesel/gas generators that will sit idle for the vast majority of the year. The cost of this and similar actions vastly exceed even the wildest estimates of the cost of introducing a demand response mechanism and Strategic Reserve.

Therefore, we strongly recommend that the AEMC introduce reforms consistent with those outlined by the Finkel Review and endorsed by state and federal energy ministers to improve energy security and affordability:

- Introduce a mechanism to facilitate demand response in the wholesale market and unlock the potential of millions of decentralised energy resources; and
- Amend the Reliability and Emergency Reserve Trader (RERT) as soon as possible to create an effective Strategic Reserve.

Any additional delays in the introduction of these reforms will further erode trust in the governance of the NEM. The EEC is deeply concerned about how little progress has been made to improve demand side participation in the NEM in the 16 years since the Parer Review. We believe that if the rate of reform does not increase, governments and stakeholders will simply pursue other avenues to reform electricity markets, either through the Energy Security Board or state-based interventions that will fragment the NEM.

We look forward to continuing to engage with the AEMC on this matter. For further information please contact me on rob.murray-leach@eec.org.au or 0414 065 556.

Yours sincerely

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Energy Efficiency Council submission to the Reliability Frameworks Review Interim Report

Table of Contents

1. Demand Response

1.1 An overview of demand response

Demand response simply means changing energy demand in response to some signal from the energy market, such as energy prices. The Interim Report correctly notes that there are potentially many sources of demand response. Demand response operates at:

- Various scales, including reducing demand from aluminium smelters, deferring cooling in warehouses and switching off household washing-machines.
- Various periods of time, from short fluctuations in demand in chilling units, to longer impact actions such as deferring water pumping by 24 hours.
- Various levels of automation and control, including automated remote load shedding and households manually switching off appliances.
- Various levels of coordination, from independent actions by large energy users to the development of complex portfolios by networks, retailers and aggregators.

The EEC notes that some forms of demand response are not desirable and should be discouraged. For example, vulnerable households should not be encouraged to reduce their air conditioner use during heat waves as this can impact their health and safety. There is a huge potential for demand response from sources that have very limited impacts on energy users, and appropriate rules and competitive markets will ensure that the market deploys these low-impact forms of demand response.

Demand response is low-cost and highly dispatchable. Recent technology developments in remote shedding, automation and coordination can enable millions of small loads to provide reliable and affordable demand response capacity.

This makes demand response perfectly suited to supporting increased penetration of intermittent generation, both in reducing demand when supply is low but also activating demand to soak up excess supply. A recent paper by Amory Lovins concludes that demand- and supply-side flexibility (including demand response) can support high penetrations of intermittent renewables without electrical storage and at *"generally lower cost than fossil-fuel backup or bulk electrical storage".*[1]

Demand response is particularly valuable in this period of transition and uncertainty, as its relatively low set up costs means that it delivers significant option value. For example, if Network Service Providers invest in network augmentations to meet a relatively short-term increase in peak demand in a region, that extra capacity might sit idle for many decades. In contrast, demand response capacity can easily be retired with very little loss of value.

The varied forms of demand response mean that it can provide various services. The EEC agrees with the conclusion in the Interim Report that demand response can provide:

- **Capacity in the wholesale electricity market:** This is generally provided by demand response that can be deployed on a regular basis with limited impacts, such as short-term reductions in the output of chiller units.
- **Emergency capacity:** This is generally provided by demand response that should be deployed very infrequently, such as reduced industrial output for a period of hours.

[1] Lovins, A. 2017 "Reliably integrating variable renewables: Moving grid flexibility resources from models to results." *The Electricity Journal vol* 30 pp58-63.

- **Frequency Control Ancillary Services (FCAS):** This is often provided by very rapid automated changes in demand that are virtually unnoticeable to energy users**.**
- **Network support**: Demand response can reduce peak demand, helping to maintain grid reliability and reducing the need for expenditure on network infrastructure.

There are interactions between these four markets. First, an energy user will be able to secure greater returns and provide lower cost services if they are able to sell their demand response capacity into multiple markets (e.g. FCAS and wholesale capacity). This means that creating markets for all four of the services that demand-response can deliver will maximise the available capacity of low-cost demand response. Second, ring-fencing may be necessary in some cases to ensure that monopolies (e.g. Network Service Providers) aren't able to crowd out competitive providers. Third, if a provider is selling demand response into the emergency market, they shouldn't be allowed to provide the capacity that is reserved for emergency purposes into other markets (this is discussed in more detail in Section 3.3).

The Interim Report correctly notes that, although costs are falling, developing demand response resources can still have a significant upfront cost and lead-time. The costs can include identifying demand response potential among energy users, engaging energy users, designing load-shedding processes so that they don't negatively impact on an energy user and installing remote load-shedding equipment.

The costs of undertaking work on a site are dramatically lower if they can be coordinated with regular periodic maintenance or site upgrades. This means that calling for demand response capacity with only a few weeks notice will result in far fewer sites offering capacity and offering it at much greater costs.

The EEC does not believe that the cost and time of developing demand response resources in any way represents a '*regulatory barrier'*, but it highlights that certain conditions need to be met to foster efficient markets for demand response. While playing with pure economic theory on paper is fun, if markets aren't designed with real-world conditions in mind then they will lead to sub-optimal outcomes.

If we want to foster efficient and competitive markets for demand response, we must:

- Ensure that energy users can sell their capacity at a fair price in competitive markets
- Provide clear price signals and policy certainty to enable resources to be developed in advance of when they are deployed. In the case of the wholesale market this simply means policy certainty and regular deployment, in the case of emergency markets this means calling for bids in advance of deployment, long-term contract and capacity payments.
- Make it relatively simple for energy uses to participate in. Given the complexity of some forms of demand response, this generally means ensuring that energy users can sell their capacity to organisations that can help them develop and deploy their capacity, such as retailers, aggregators and other third parties.
- Allow for aggregation to reduce costs and increase the coordination of demand response.
- Create competitive markets that encourage technology development and market innovation to improve options and outcomes for consumers.

1.2 Sub-optimal levels of demand response in the NEM

While there is no comprehensive estimate of the level of demand response occurring in the NEM, all the evidence indicates that the level of demand response is well below the economic potential.

In terms of 'contracted' demand response, estimates produced by the AEMC and AEMO suggest that demand response contracted to retailers and AEMO makes up much less than 2 per cent of the capacity in the NEM, compared to around 10 per cent contracted demand response in well-functioning overseas energy markets, such as the PJM in the United States.

In terms of 'uncontracted' demand response, since we don't have firm estimates the Interim Report is technically correct in stating *"there **may** be substantially more wholesale demand response present in the NEM that is not visible"* (p116). However, all indicators are that the level of uncontracted demand response is limited and well below the economic potential.

The vast majority of energy users aren't exposed to the wholesale electricity price and don't face incentives to undertake optimal levels of demand response. Any suggestion that they would somehow undertake efficient levels of demand response in the absence of a price signal is nonsensical. Based on conversations that our members have with sites that are exposed to wholesale electricity prices, we know that some undertake reasonable levels of demand response but many undertake only very limited demand response.

Therefore, there is no basis in either logic or fact for some generators' claims that there might be a huge volume of 'hidden' demand response that is delivering optimum levels of demand response in the NEM. It is clear that the level of demand response in the NEM is well below the economic potential.

2. Wholesale Demand Response

Unlocking the potential for wholesale demand response in the NEM will significantly increase both reliability and affordability of electricity. Increased demand response will raise the volume of low-cost dispatchable capacity, giving consumers more control, increasing competition and displacing the dispatch of more expensive forms of capacity.

2.1 Benefits of increasing wholesale demand response

Increased participation of demand response in the wholesale electricity market would deliver significant benefits to energy consumers through multiple routes:

- Demand response by individual energy consumers will maximise those energy consumers' utility by reducing their consumption of electricity during periods when the price of energy exceeds the utility of energy consumption;
- Deployment of demand response will benefit all energy consumers by substituting for the use of higher-cost forms of capacity and therefore lowering energy prices. Including demand response in the PJM is estimated to have reduced total consumer costs for capacity by up to USD 12 billion in a single auction period;[2] and
- The potential deployment of demand response (whether it is deployed or not) will increase competition in the wholesale market and reduce the potential for generators to exploit their market power during periods of tight supply-demand balance, resulting in greater economic efficiency and lower prices for consumers.

Expanding on this last point, there are currently many periods when only a small number of generators are able to offer additional supply into the market, which results in exploitation of market power and very high wholesale prices. Increasing the number of participants in the wholesale market would significantly increase competition and reduce the potential for generators to 'game' the market through inappropriate bidding practices.

If consumers are able to offer demand response into the wholesale market – directly or via third parties - it should lead to the price-setting generator bidding in capacity just below the price that they expect various tranches of demand-response to be dispatched. This might mean, for example, that a gas-fired generator would bid in at $2,000 per MWh, rather than $14,000 per MWh. Generators could still gain high prices for their output if a region's demand-response capacity is fully deployed, meaning that the market would only deliver a strong signal for investment in expensive forms of dispatchable capacity if it is actually required.

In 2015 the Australian Government commissioned Oakley Greenwood to model the costs and benefits of a wholesale demand response mechanism. Oakley Greenwood used AEMO projections that assumed that there would be excess deployable capacity in the NEM for the next decade. This projection has proven to be incorrect. As a result, the modelling substantially underestimated the potential benefits of a demand response mechanism. Nevertheless, Oakley Greenwood still recommended the introduction of a mechanism to facilitate demand response on the basis that it would increase competition, give consumers more choice and reduce the ability for generators to exploit their market power.

We fully expect that some generators will object to reducing barriers to demand-response in the wholesale energy market, as these changes will reduce their market power and ability to gain extraordinary returns at the expense of consumers. In previous inquiries into demand response, we saw risible objections to demand response, such as the claim that it would cost

[2] International Energy Agency 2017 *Market Based Instruments for Energy Efficiency,* IEA, Paris page 33.

over $100 million to upgrade retailers' billing systems to facilitate demand response. At their heart, these objections were really concerns about increasing competition in the wholesale energy market, and we urge the AEMC to dismiss such claims as shameless rent seeking.

The EEC would like to engage with the AEMC to ensure that a new modelling exercise on the costs and benefits of a demand response mechanism includes realistic assumptions. An EEC submission to the AEMC on the proposed demand response mechanism in 2015 stated:

> *The assessment [of the impact of a demand response mechanism] should take into account the full range of costs and benefits. Specifically, while the focus should be on the matters set out explicitly in the National Electricity Objective (NEO) (such as price, quality and reliability of electricity supply) it must also take into account factors that include, but are not limited to:*
>
> - *The benefits of greater customer choice and competition particularly in an energy market that is under transition; and*
> - *The potential benefits of the DRM in developing a market for demand-side participation that provides other services, such as reduced expenditure on network infrastructure and low-cost FCAS.*
>
> *The assessment should use a time frame to 2050 for assessing costs and benefits. We believe that the DRM will deliver modest benefits in the short-term, but much more substantial benefits as the mix of generation in the market changes (e.g. more intermittent generation) and the current excess capacity in both generation and network infrastructure is reduced. However, the rule change is required immediately as the DRM market will take some time to grow and mature.*

These points still hold true. Particularly notable is that the EEC's prediction that dispatchable capacity in the NEM would decrease – in fact we underestimated the speed of transition in the generation mix. However, we take little comfort from being proven right, as the failure to introduce a demand response mechanism in 2016 has likely cost consumers tens if not hundreds of millions of dollars.

2.2 Barriers to demand response in the wholesale market

The EEC agrees with the conclusion in the Interim Report that the main factor impeding the development of wholesale demand response is the complexity faced by most consumers in selling their wholesale demand response capacity to anyone except their electricity retailer.

The Interim Report correctly states that demand response can currently only effectively 'participate' in the wholesale energy market through three routes:

- Large energy users that are fully exposed to the wholesale energy price reduce their energy use without any engagement with other market participants. It should be noted that most energy users are not allowed to buy energy directly from the wholesale energy market;
- Energy users agree with an energy retailer to face full pass-through of wholesale electricity prices. While large energy users are increasingly taking this option, this still represents just a fraction of energy users; and
- Energy users have an agreement with their energy retailer that provides a genuine incentive to reduce their demand during periods of high wholesale energy prices. It should be noted that, even where retailers offer customers incentives to undertake demand response, many do not offer incentives that genuinely reflect the benefits of demand response during periods of high wholesale energy prices, leading to sub-optimal deployment of demand-response.

Any energy user can currently physically reduce their demand or engage a third-party expert to help them find and deploy their demand-response capacity. However, unless the energy user is exposed to the wholesale electricity price, neither they nor any third-party can capture the value of wholesale demand response without a contract with their energy retailer. This reduces the uptake of wholesale demand response.

This highlights that the AEMC has made a logical error in multiple statements relating to wholesale demand response. In the Interim Report the AEMC states that there *'appears to be no regulatory barriers to wholesale demand response'.* In the 2016 Final Rule Determination on a demand response mechanism the AEMC states that '*retail supply and demand response are not bundled'*.[3]

The AEMC has mistakenly extended the (correct) statement that the National Electricity Rules (NER) do not **completely prevent** wholesale demand response to the (incorrect) statement that the NER do not **impede** wholesale demand response. While the NER do not explicitly mandate the bundling of demand response and retail supply nor completely prevent the deployment of demand response, the NER create a market in which it is extremely difficult for most energy consumers to gain value from or sell their demand response capacity without the agreement of their retailer.

Making it harder for energy consumers to gain value from their demand response capacity, or sell it to anyone but their retailer, has a number of negative outcomes:

- Reducing the competitiveness and efficiency of both the market for demand response capacity and the market for retail supply.
- Increasing the complexity for consumers to partner with demand side providers to sell their demand response capacity to other markets, such as frequency control, network services and emergency demand response.

[3] AEMC 2016, Final Rule Determination, National Electricity Amendment (Demand response mechanism and Ancillary Services Unbundling) Rule 2016,

- Vertical integration between retail supply and generation means that some retailers may face incentives to suppress demand response by their customers.

There are many advantages to bundling energy retail and demand-response services together, and several members of the EEC are retailers that offer their clients exceptional value through combining these services. However, this does not negate the need to ensure that there's a competitive market for demand response that can be linked to the markets for other demand response services.

Developing an open, competitive market for demand response will likely lead to more retailers offering their customers attractive demand response services or incentive payments, either directly or through a third-party provider. This is similar to the way that the wholesale electricity market has encouraged the development of a more efficient electricity market (including bilateral contracts), despite direct purchases from the wholesale electricity market accounting for just a fraction of electricity sales.

The challenges under the current NER of separating retail supply and demand response services reduces the efficiency of each market. It is similar to requiring car purchasers to buy insurance from their car's manufacturer and expecting that this would lead to a competitive market for car insurance. While some energy retailers have good knowledge, processes or partnerships to run effective demand-response programs, many lack them. Forcing energy consumers to make even more complex trade-offs in their choice of retailer than they need to will lead to sub-optimal outcomes.

In addition, the barriers to the separation of retail supply and demand response make it harder for consumers to develop an economic demand response capacity, and make it harder for retailers and third parties to develop attractive products and services. Many consumers will only be able to undertake their optimum level of demand response if they are selling their capacity into multiple markets. Forcible bundling not only makes it more complex to sell into multiple markets, but it also suppresses wholesale demand response, which will have a knock on effect of suppressing demand response in other markets.

In addition, vertical integration may create an incentive for some gentailers to suppress demand response in the energy market, including demand response by their own customers. Box 6.4 in the Interim Report presents the incentives facing a retailer to purchase demand-response services, but doesn't consider the incentives facing the generation arms of gentailers.

Box 1 below works through the incentives that a gentailer could face depending on their assets and contractual structures. This scenario is hypothetical and it is possible that no real getailer in the NEM faces these incentives. However, it highlights that, in the current regulatory environment, some gentailers could conceivably face an incentive to suppress demand response by their customers. This issue, which was flagged in the Power of Choice Report, creates a strong case for simplifying unbundling.

In summary, the current NER will not encourage the optimum level of demand response in the wholesale electricity market. Enabling consumers or third parties to sell demand response into the wholesale electricity market would address these barriers, even if it simply encouraged more retailers to offer customers attractive demand response services.

It is important to state why the EEC did not put these points in writing to the AEMC in 2016 after the AEMC released the Draft Determination on the demand response mechanism. Our view, which is widely shared, is that once the AEMC has made a draft determination it is extremely unlikely to change its position. Given this, we considered further engagement with the AEMC regarding the Final Determine to be a poor use of our resources.

BOX 1

"Snoke" is a gentailer that has a retail arm and generation arm.

- Snoke's retail arm sells electricity to a large number of consumers. If Snoke's customers reduce their demand during periods when the wholesale energy price is greater than the price that Snoke charges customers for energy, it will reduce the retail arm's liabilities.
- However, Snoke's generation arm has contracts in place that enable it to make large profits during periods of high wholesale energy prices by selling energy to:
    - Customers that are exposed to the wholesale energy price;
    - The wholesale energy market (not customers); and
    - Other market participants through bilateral contracts etc.

If reducing Snoke's fixed-price customers' consumption reduces the wholesale electricity price in a way that reduces Snoke's generation arm's income MORE than the retail arm's liabilities, Snoke would be incentivised to suppress demand response.

2.3 Principles and design

A mechanism to facilitate demand response in wholesale markets should follow the following principles:

- **A customer's right to provide demand response**. Most energy users are currently unable to capture a fair fraction of the value of any wholesale demand response. All energy users should have the right to negotiate to provide wholesale demand response on reasonable terms without being required to change energy retailers.
- **Separation of demand response from electricity retail services.** The AEMC should design the rules and frameworks so that consumers can sell their demand response capacity to a third party. This will create competitive markets that will encourage innovation and provision of demand response services to consumers at lowest cost.
- **Recognition that demand-response facilitation and aggregation are services.** Energy users often require experts to locate and unlock demand response flexibility within their facilities. They may also need experts to aggregate their demand response capacity with other users to create a portfolio that meets the specifications required by market participants. For example, individual homes would be unable to provide guaranteed demand response capacity in sufficient volume to address network constraints, but a network or third-party providers could combine multiple homes into firm capacity. In order to engage with an expert, an energy user would need to be able to capture part of the value of their demand response and transfer part to this value to the provider.
- **Effective baseline system.** An effective baseline system will be required to determine the quantum of demand response delivered in order to separate demand response from electricity retail services. Some parties (mainly generators that stand to lose from the increase of competition in the wholesale energy market) have stated that there is a risk that a demand-response system could be gamed to artificially inflate demand response. However, decades of overseas experience in demand response have lead to the development of effective methods for determining quanta of demand response. In order to game these systems, an energy user would need to inflate their energy use for large periods of time on the chance of a small reward for demand response. Any energy user that attempted to do this would make a huge loss. Therefore, if the appropriate protocols are followed, the potential for gaming should be negligible.

The AEMC proposed an effective design for a demand response mechanism in 2012. The AEMC chose not to pass the Rule Change to enact this model in 2016 on weak grounds, in particular the fact that the NEM had excess capacity in 2015-16. The NEM no longer has excess capacity and we strongly recommend that the AEMC reconsider this model.

The EEC recommends that the COAG Energy Council re-submit this Rule Change to the AEMC, with minor changes so that it's mandatory for retailers to let customers participate. If the AEMC still believes that this model is still not appropriate, the AEMC can propose an alternative model while it is considering the Rule Change. This would enable the Rule Change process to commence as soon as possible while allowing the AEMC the flexibility to design the mechanism that it believes is most appropriate.

The EEC strongly recommends against the AEMC waiting for industry to propose an alternative model before commencing the Rule Change process. This approach puts a huge burden on industry to design a Rule Change, which makes no sense given that the AEMC has substantial resources that it can dedicate to the design of a Rule Change.

3. Strategic Reserve

A Strategic Reserve has an important long-term role as an emergency system that minimises the impacts of low-probability, high-impact circumstances, such as multiple generator failures or the loss of more than one transmission line. Other 'energy-only' markets have some form of Strategic Reserve, including Texas, Germany and Nordic countries. While the NEM has the RERT, the current rules impede its effectiveness. Minor changes to the existing RERT rules should enable AEMO to develop an effective Strategic Reserve.

If there had been a Strategic Reserve mechanism in the NEM in previous years it may have prevented multiple instances of involuntary load-shedding and even blackouts. While the Interim Report notes that the existing (flawed) RERT was rarely called on, it fails to mention the many occasions where an effective Strategic Reserve could have reduced the negative impact of events on energy consumers.

A Strategic Reserve would ideally only be deployed on very rare occasions to avoid load-shedding incidents. However, a Strategic Reserve might need to be called on more frequently in coming years due to the heightened risk of shortfalls in deployable capacity in some parts of the NEM. The increased risk of shortfalls in deployable capacity is due to:

- A large number of coal-fired generators reaching the end of their economic life and either closing or becoming increasingly unreliable;
- Increased penetration of intermittent generation; and
- Insufficient investment in deployable capacity to meet these circumstances due to:
    - Policy uncertainty, such as the lack of a carbon price;
    - The failure of the energy governance system to keep energy market rules up to date with changing technology and circumstances. For example, the failure to introduce a wholesale demand response mechanism in 2016 impeded the development of dispatchable demand response capacity.

The AEMC has expressed concerns that developing a Strategic Reserve could distort the development of capacity in the wholesale electricity market. However, an appropriately designed Strategic Reserve should have limited impact on the development of deployable capacity that can operate in the wholesale electricity market.

Moreover, the absence of a Strategic Reserve is causing far greater distortions to the wholesale electricity market than a Strategic Reserve ever would. Several governments perceive that there are risks of capacity shortfalls and, combined with their declining faith in governance of the NEM, this led them to take independent actions to improve energy security. These state-based actions have come at much greater cost to consumers and distorted energy markets far more than a Strategic Reserve ever would.

For example, the South Australian Government recently spent over $339 million on diesel/gas generators that will still idle for the vast majority of the year, won't operate within the wholesale electricity market and will distort investment in the energy sector. If an effective Strategic Reserve had been in place for several years it would have provided capacity at much lower cost, given the South Australian Government comfort and avoided this distortionary investment.

The development of an effective, competitive national Strategic Reserve mechanism will reduce the political pressure for governments to take action outside the framework of the NEM. Therefore, we strongly recommend that the AEMC make changes to the RERT to enable the development of a Strategic Reserve as soon a possible.

3.1 The need for an emergency capacity mechanism

It is standard practice for electricity markets to have emergency system in place to minimise the negative effects of low-probability but high-impact circumstances, such as storm damage to transmission infrastructure or multiple generators failing simultaneously.

It would be prohibitively expensive (if not impossible) to set up a system to run optimally under all circumstances, and so emergency systems are set up to minimise the impacts of low probability events. As a simple analogy, most off-grid households have battery-powered torches to provide a critical service (light) during system failures. While the household may never use the torch, at $20 it is a worthwhile form of insurance.

Similarly, a Strategic Reserve provides a form of insurance for the electricity system. The NEM already relies on a number of mechanisms, including involuntary load-shedding and *System Restart Ancillary Services* to minimise the impact of unplanned supply outages. A Strategic Reserve would add to these existing mechanisms by enabling the system operator to deploy 'emergency capacity' that, while normally undesirable to deploy due to its cost or impact, is preferable to involuntary load-shedding or a system black.

For example, if several generators shut down during a heatwave, household air conditioning could still stay operational if factories shut off non-critical equipment or hospitals run emergency generators that they would normally prefer to keep off due to costs and noise.

This means that the resources in a Strategic Reserve would ideally very rarely be called on. A Strategic Reserve should comprise resources with a relatively low set-up cost, but likely a high deployment cost. Due to the high deployment cost, these resources would normally be unwilling to participate in the wholesale market where prices are capped at $14,000 MWh. This suggests that the majority of an effective Strategic Reserve is likely to be composed of certain types of demand response (e.g. shutting off a factory line) as this would be much cheaper to set-up than building generation, but have high deployment costs.

The wholesale electricity market won't provide an incentive for either the development or deployment of emergency capacity for the simple reason that it's not designed to value the benefits that this kind of capacity delivers (e.g. prevention of a system black). The benefits of emergency capacity extend beyond the wholesale energy market, including benefits to electricity networks that have flow-on social and economic benefits to all energy users.

The design of the wholesale electricity market also means that it won't provide an incentive to build and deploy emergency capacity. The wholesale electricity market incentivises companies to build and deploy capacity (whether generation or demand response) that is deployed on a reasonably regular basis. While some wholesale capacity might only be deployed during peak demand periods or when large generators trip, it is still called on frequently enough for companies to be able to estimate this frequency and therefore their likely income over a year.

However, the wholesale energy market can't provide an incentive to invest in capacity that is ideally never called. No private company would pay the cost to set up systems that might never be called in a five-year period if it was only being paid based on deployment. A Strategic Reserve for emergency purposes is effectively a form of insurance for energy consumers, and as such should be constructed of two payments:

- An upfront payment that at least covers the cost (including time) of setting up resources (e.g. installing load-shedding processes and equipment). As this is an insurance payment, this should be paid well in advance of any potential outage; and
- A high payment to cover the cost of deployment.

There are theoretically a number of ways to determine these payments, such as competitive auction processes where companies put forward a proposal for both set-up and deployment costs. However, the current RERT process is not ideal as it is based on opaque, bespoke contracts that reduce both equity and competitiveness. We are encouraged by statements from AEMO that indicate their preference to move towards open, transparent reverse-auction-style mechanisms for buying emergency capacity services.

This highlights that the Interim Report fundamentally mischaracterises a Strategic Reserve as a form of intervention in the market. In fact, a Strategic Reserve should be a *market-based mechanism* that rewards investors for a different set of services than those delivered by the wholesale electricity market. We see the development of emergency capacity contracts as similar to the development of the *Frequency Control Ancillary Services* market that rewards investors for providing services that aren't incentivised by the wholesale electricity market. The changes to the RERT that we propose below would turn the RERT into an effective market-based Strategic Reserve.

3.2 Transition in the energy market

In recent years investors have not invested in a mix of demand-side and supply-side resources in the NEM that delivers the ideal level of reliability for a number of reasons, including policy uncertainty and the failure of the energy governance system to keep energy market rules up to date with changing technology and circumstances.

The EEC strongly recommends that governments and policy makers work with experts and consumers to solve these problems at their root, such as the development of a long-term framework to address energy and greenhouse gas emissions. However, these problems are likely to take some time to fully resolve and, in the meantime, a Strategic Reserve may be called upon more frequently. This means that AEMO will likely need to buy more capacity for a Strategic Reserve in the next few years (while the energy system and rules are transitioning) than it will need to in the longer-term.

If AEMO isn't allowed to contract for additional capacity during this transitional period it will:

- Increase the risk of load shedding and system blacks; and
- Increase the likelihood that state governments take unilateral action and directly invest in additional capacity, such as the South Australian Government's recent $339 million purchase of emergency diesel/gas generators.

If AEMO is given the freedom to contract as much Strategic Reserve as it deems required, it can ramp the size of the Strategic Reserve up and down with a reasonable notice period. As the Reserve winds down:

- Capacity that is expensive to have on standby and deploy (e.g. factories that are on call to close production lines) will retire from the Strategic Reserve, leaving behind lower cost 'emergency' resources.
- Capacity that is suited to other markets will transition across once rule changes are enacted (e.g. demand response that is relatively cheap to deploy will transition to the wholesale energy market once a demand response mechanism is operational).

With the appropriate designs, a Strategic Reserve should have minimal negative impact on the development of capacity in the wholesale electricity market. First, the Strategic Reserve should be designed to be less attractive to participate in than the wholesale energy market for frequently deployed resources. Second, AEMO should be strongly encouraged to only deploy the Reserve in situations when the market is likely to face a shortfall – this could potentially be enacted by automatically raising the wholesale energy price to the cap when the Reserve is deployed.

In fact, a well-designed Strategic Reserve should facilitate the development of new resources for the wholesale electricity market. If energy users develop load-shedding systems for a Strategic Reserve it will significantly increase the chance that they will identify and deploy loads that they can shed more frequently in the wholesale market. In addition, as noted above, some of the capacity that energy users and others originally develop for use in Strategic Reserve will be transferred across to the wholesale market once the demand response mechanism is in place. The consequent increase in dispatchable capacity in the wholesale market would enable AEMO to more rapidly reduce the size of the Strategic Reserve.

Finally, as set out above, the absence of an effective Strategic Reserve will lead to governments taking actions that could be far more distortionary than a competitive, market-based Strategic Reserve.

3.3 Principles for a Strategic Reserve

The Strategic Reserve should be designed to meet the following principles:

- **Sufficient lead-time and policy certainty:** This is essential to enable energy users to identify and develop Strategic Reserve capacity as cheaply as possible. The cost of setting up load-shedding systems (including reducing the negative impacts that this could have on a site) is substantially lower if it is done during scheduled site upgrades or maintenance.
- **Payments for availability:** Ideally, the resources in a Strategic Reserve would only be deployed in very rare situations. This means that energy users would need to receive some form of payment that at least covers the cost of making their sites capable of participation. Ideally, this would be determined through a competitive bidding process, but alternative approaches may be possible.
- **Payment for delivery:** Payments for deployment should at least cover the cost of deployment. Ideally, this would be determined through a competitive bidding process, but alternative approaches may be possible.
- **Technology neutral, transparent and competitive bidding:** While the EEC believes that demand-response would likely make up the majority of capacity under a strategic reserve, we believe that any process for selecting capacity should be open to all forms of capacity that are not deployed in the wholesale market.
- **Limiting overlap with the wholesale market:** Resources in a Strategic Reserve should be reserved for situations when the wholesale market cannot deliver sufficient capacity. While we support the principle that resources that bid into a wholesale market shouldn't be able to bid into the Strategic Reserve and vice versa, we note that:
    - Some resources that are initially developed for the Strategic Reserve may choose at some point to shift into the wholesale market and vice versa. This is actually desirable, as resources should bid into the markets that they are best suited to; and
    - Aggregators that develop a portfolio of demand-response or generation capacity could easily deploy part of that capacity in the wholesale market (e.g. if they have a portfolio of 100 MW they could guarantee delivery of 30MW for wholesale bidding) and part to the emergency market (e.g. guaranteed deliver of 20MW). Individual sites that are contracted to the aggregator could deliver into both markets: for example, an industrial site may have some quite discretionary load that is suitable for wholesale market participation, but also be willing to shut off much more of the plant in an emergency.

3.4 Enacting a Strategic Reserve

While many features of a Strategic Reserve should be worked out carefully by AEMO in consultation with experts, we believe that the following features and changes are essential:

- **Risk Assessment:** Currently, AEMO is only allowed to identify the need for Strategic Reserve based on a very basic 'unserved energy' framework, which has resulted in avoidable supply shortfalls. AEMO should be allowed to use a more effective risk assessment framework that takes into account of multiple factors to determine the quantum of Strategic Reserve required in various locations.
- **Long notice:** The RERT regulations need to be changed so that AEMO can seek bids well in advance of 10 weeks of a potential shortfall, and ideally at least a year before a potential shortfall.
- **Reasonable contract length**: AEMO should be allowed to write a variety of contracts for Strategic Reserve capacity, including multi-year contracts. This will enable the provision of capacity that might have reasonable set-up cost (e.g. installing remote load-shedding technology) but low maintenance costs; and
- **Transparent auctions**: AEMO should undertake transparent and competitive auctions for Strategic Reserve capacity.