Mr Declay Kelly
Australian Energy Market Commission
Level 6, 201 Elizabeth Street
Sydney NSW 2000

21 December 2018

Re: ERC0247, ERC0248, ERC0250
Wholesale demand response mechanisms, Consultation paper

Dear Mr Kelly

The attached paper sets out the Energy Efficiency Council's (EEC) response to the Australian Energy Market Commission's (AEMC) Wholesale demand response mechanisms, Consultation paper (hereafter referred to as the 'Consultation Paper').

There is substantial evidence that the level of wholesale demand response in the National Electricity Market (NEM) is below the economic potential. Increased levels of wholesale demand response in the 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 older coal-fired generators.

The current National Electricity Rules (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. This causes a number of problems:

- While some electricity retailers that offer their clients exceptional value for demand response services, other retailers may lack the skills to offer their customers demand-response services and some may face incentives to suppress demand response by their customers.
- Many consumers need to engage their retailer if they want to seek demand response services from a third-party provider. This requires a three-way negotiation that entails significantly higher costs than a two-way negotiation, even in the circumstances that an energy retailer is willing to let their consumer engage a third-party service provider. This suppresses competition in the market for demand-response services.
- The effective linkage between demand-response services and retail services not only reduces the competitiveness and efficiency of the market for demand response services, it potentially also reduces the competitiveness and efficiency of the market for retail supply services.

Addressing these barriers and unlocking more economic demand response would deliver significant benefits to energy consumers. The benefits of developing and implementing an effective demand response mechanism (DRM) would substantially exceed the costs of developing and implementing an effective DRM.

The EEC:

- Strongly supports the development of a DRM based on key elements of the Rule Change proposals by the South Australian Government and by the Public Interest Advocacy Centre (PIAC), Total Environment Centre (TEC) and the Australia Institute (TAI).
- Supports further consideration of the South Australian Government's proposal to a transitional, separate market for demand response prior to the implementation of a wholesale demand response mechanism. The EEC can believes that there is merit in developing a detailed design for this proposal, which would enable the AEMC, EEC and others to properly consider the pros and cons of a transitional market.
- Opposes the Australian Energy Council's (AEC) proposed Rule Change, which involves the development of a wholesale demand response register. The EEC recommends that the AEMC does not give any further consideration to the AEC's proposed Rule Change, as it manifestly fails to address the impediments to demand response that have been identified by the AEMC and others.
- Opposed a model for wholesale demand response that is based on rewarding consumers for involuntary load-shedding. This model fails to encourage demand response by consumers who are most willing, or most incentivized, to do so.

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

Rob Murray-Leach
Head of Policy
Energy Efficiency Council

energy efficiency
COUNCIL

Energy Efficiency Council submission on

ERC0247, ERC0248, ERC0250
Wholesale Demand Response Mechanisms
Consultation Paper

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. 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.
- **Frequency Control Ancillary Services (FCAS):** This is often provided by very rapid automated changes in demand that are virtually unnoticeable to energy users**.**

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

- **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, and 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.

Although the costs of developing demand response resources are falling, developing 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.

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. 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, there are no firm estimates of the level of demand response, but all the indicators point to a level of uncontracted demand response that 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 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.

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

2.2 Barriers to demand response in the wholesale market

The EEC agrees with the conclusion in the AEMC's Reliability Frameworks' 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 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.

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.
- 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.

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.

3. Demand Response Mechanism

3.1 Model for a Demand Response Mechanism

The EEC strongly supports a model for a demand response mechanism (DRM) based on key elements of the Rule Change proposals by the South Australian Government and by PIAC, TEC and TAI. This model involves:

- An energy consumer can transfer the value of wholesale demand response from their Financially Responsible Market Participant (FRMP) (i.e. electricity retailer) to a demand response service provider (DRSP), who may be the customer or a third party service provider engaged by the customer.
- DRSPs could submit demand response bids into the wholesale market
- Demand response offers would be scheduled in a manner similar to bids submitted by generators. However, the EEC strongly argues that DRSPs' bids can be comprised of either individual sites or portfolios of sites – if the bids are comprised of portfolios, the scheduling would apply to the portfolio, rather than individual sites that form part of the portfolio. For example, if a demand response aggregator had a portfolio of 100 sites and could bid in 100MWh of demand response, but bid in just 5MWh of demand response, the demand response aggregator would have obligations around 5MWh of scheduled demand response. The only obligations on individual sites within that portfolio should come from negotiations between the energy user and the demand response aggregator.
- The DRSP would be exposed to the spot price for the difference between a baseline level of consumption estimated to have occured were it not for the demand response, and the actual level of consumption. The FRMP would be settled in the wholesale market at the spot price for the baseline level of consumption. This would allow the value of the wholesale demand response to accrue to the DRSP without the involvement of the retailer.
- The DRSP would earn the spot price from the wholesale market for the reduction in energy demand by its participating customers and would pay customers for the value of their demand reduction based on agreed commercial arrangements.
- All retail energy customers would be free to participate in this mechanism.

3.1 Benefits and Costs of a Demand Response Mechanism

This mechanism would deliver significant benefits by facilitating a rapid expansion in the level of demand response, potentially reducing costs for energy consumers by billions of dollars over the coming decade.

The benefits of introducing a DRM would vastly outweigh the modest costs of implementing the DRM. The AEMC quotes a frankly ridiculous estimate that implementing a DRM could entail retailer system upgrade costs of up to $112 million over ten years. The total cost to all retailers of system upgrades for a DRM is likely to be well under $10 million and the figure of $112 million has been extensively debunked – this figure is not only ludicrous, but the reasons for its inaccuracy are well-known. The absence of a plausible cost-estimate of implementing the DRM does not permit the use of implausible figures – rather it implies that the AEMC should develop a plausible cost estimate.

4. Transitional Market for Demand Response

The EEC also supports further consideration of the South Australian Government's proposal to a transitional, separate market for demand response prior to the implementation of a wholesale demand response mechanism. The EEC can believes that there is merit in developing a detailed design for this proposal, which would enable the AEMC, EEC and others to properly consider the pros and cons of this model.

A transitional market for demand response has the potential benefit of allowing the rapid development and deployment of a market for wholesale demand response outside the wholesale energy market, which would enable issues such as baselining to be further refined prior to opening up the wholesale energy market to large quantities of demand response. However, there is the risk that developing a transitional market for demand response could delay the development of the full DRM.

The pros and cons of a transitional market for demand response cannot be properly estimated until a detailed model has been developed.

4. AEC Rule Change Proposal

The EEC opposes the AEC's proposed Rule Change, which involves the development of a wholesale demand response register. The EEC recommends that the AEMC does not give any further consideration to the AEC's proposed Rule Change, as it manifestly fails to address the impediments to demand response that have been identified by the AEMC and others.

As noted earlier, the current 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. This causes a number of problems:

- While some electricity retailers that offer their clients exceptional value for demand response services, other retailers may lack the skills to offer their customers demand-response services and some may face incentives to suppress demand response by their customers.
- Many consumers need to engage their retailer if they want to seek demand response services from a third-party provider. This requires a three-way negotiation that entails significantly higher costs than a two-way negotiation, even in the circumstances that an energy retailer is willing to let their consumer engage a third-party service provider. This suppresses competition in the market for demand-response services.
- The effective linkage between demand-response services and retail services not only reduces the competitiveness and efficiency of the market for demand response services, it potentially also reduces the competitiveness and efficiency of the market for retail supply services.

The AEC's Rule Change proposal effectively mandates that electricity retailers would continue to be the gatekeepers for wholesale demand response for many consumers. Regardless of the AEC's proposal that retailers would be encouraged to act in 'good faith' (which implies that some retailers may currently not be acting in good faith), this mandates a three-way negotiation between a retailer, energy user and demand response aggregator. At best, this Rule Change would entail substantial transaction costs in the development of demand response capacity, reducing market efficiency. At worst, a retailer could significantly impede their customers from engaging third-party demand-response aggregators.