Dr Kerry Schott AO and David Swift
Energy Security Board
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19 October 2020

Re: Energy Efficiency Council response to Post 2025 Market Design Consultation Paper

Dear Dr Schott and Mr Swift

The Energy Efficiency Council (EEC) thanks you for the opportunity to comment on the Energy Security Board's (ESB) *Post 2025 Market Design Consultation Paper.* Our response to key sections of the Consultation Paper is set out in the attached submission, but this letter sets out some key high-level points. In this submission we use the term 'energy management' to refer to a broad suite of measures including energy efficiency, demand response and load shaping.

Managing how much energy we use, and when we use it, is essential to ensure that electricity remains reliable and affordable. Energy management already delivers significant benefits to consumers and the National Electricity Market (NEM), but increasing the volume of energy management and better aligning it with the needs of the NEM would deliver far greater benefits, including:

- **Large volumes of reliable capacity**

  Energy management delivers low-cost, reliable and zero emissions capacity. The International Energy Agency (IEA) has concluded that improvements in energy efficiency have delivered more capacity than any form of generation, and the IEA now calls energy efficiency the 'First Fuel'.

  We welcome the significant focus in the consultation paper on using demand response to provide capacity - industrial sites can conservatively deliver at least 3.8 Gigawatts of demand response.[1] However, we also note that improvements in energy efficiency (e.g. improved air conditioner efficiency) could easily reduce peak demand in the (NEM) by 5 per cent by 2030 – providing almost double the capacity of the Liddell Power Station.[2]

- **Support the transition to clean generation**

  In addition to providing dispatchable capacity, flexible energy use can help the NEM incorporate higher levels of wind and solar generation. For example, pre-cooling insulated homes during the middle of the day can both absorb the excess output of solar PV systems and reduce the size of the evening peak. Accordingly, Germany has adopted the principle *'Energy Efficiency First'* (discussed later in this submission) as a central plank of the *Energiewende.*

- **Ensure that energy bills remain affordable**

[1] ClimateWorks Australia 2014, *Industrial demand side response potential*, Climate Works Australia, Melbourne.

[2] A saving of 5 per cent is conservative based on energy savings realized in jurisdictions like California, China and Japan.

Energy management primarily lowers consumers' bills by lowering the units of energy that they consume – energy efficiency improvements in Germany between 2000 and 2017 saved the average German household $790 off their energy bills in 2017.[3] However, energy management can also lower the cost per unit of energy by providing low-cost capacity. After demand response and energy storage were allowed to provide Frequency Control Ancillary Services (FCAS), the cost of FCAS dropped substantially.

Some of the barriers to better energy management lie outside the NEM rules and processes, such as poor compliance systems associated with the quality of new homes in Australia. However, there are a variety of barriers to energy management in the NEM, which have been identified in numerous reports including the *Parer Review* in 2002 and the *Finkel Review* in 2017. The *Parer Review* states:

> *"The Panel found that there is a relatively low demand side involvement in the NEM because:*
>
> - *The NEM systems are supply side focused;*
> - *The demand side cannot gain the full value of what it brings to the market; and*
> - *Residential consumers do not face price signals."* [4]

The fundamental reason for the reason that the NEM has favoured supply-side capacity over demand-side capacity was highlighted in a 2019 report by the Australian Energy Market Commission (AEMC) - Australia's energy markets have been designed around mobilising supply-side resources to meet demand, with much less effort on demand-side investment.[5] In other words, we have designed our markets based on supply-side assumptions, and so they are biased towards supply.

The EEC thanks the ESB for its leadership in considering the future of energy markets, particularly the focus on demand-side measures in the two-sided market. We found it challenging to respond to the Consultation Paper, because it canvasses a very wide variety of potential changes to energy market rules, but doesn't resolve a number of strategic issues.

The EEC recommends that the ESB first finalise a number of strategic issues which will help stakeholders consider detailed proposals. In particular, we recommend that the ESB adopt the European Union's principle *'Energy Efficiency First'*. It's important to clarify that *'Energy Efficiency First'* doesn't mean that energy management should be given precedence over energy supply. Instead, based on the recognition that energy systems tend to be designed with a supply-side bias, the principle requires decision-makers consider both supply-side and demand-side issues *first*, before they embark on policy design or infrastructure investments. In other words, *'first'* refers to *sequencing,* rather than *priority.*

[3] IEA 2017, *Energy Efficiency Market Report 2017*, IEA, PARIS

[4] Parer, W. 2002 *COAG Energy Market Review – Towards a Truly National and Efficient Energy Market*, Commonwealth of Australia, Canberra, p 174

[5] AEMC 2019 *Wholesale demand response mechanism, Draft rule determination*, AEMC, Sydney. p 35-42.

Therefore, while the EEC welcomes the work on a two-sided market, we believe that the role of energy management in the future energy market should be elevated to a strategic issue that then impacts on a range of potential energy market designs.

In practice, this means that we support merging the section on a two-sided market with the section on valuing distributed resources and expanded to look at a range of serious challenges to energy management, including:

- **Technology neutrality:** The EEC supports the principle of technology neutrality, but all too often this has meant designing energy markets around the capabilities of specific supply-side technologies (e.g. coal-fired generators) and expecting other technologies with different pros and cons to match these capabilities. True technology neutrality should involve considering; the market's actual needs; the features and challenges facing various technologies; and what systems would dispatch the optimal mix.
- **Incentives:** All energy users should be able to seamlessly face incentives to manage demand, regardless of their current retail arrangements. This is the key to the Wholesale Demand Response Mechanism (WDRM) - it offers energy users a very low barrier to entry if they want to *try* demand response. Currently, energy users need to become spot exposed or have a major change to their retail plan to even *try* demand response. In other words, we need to consider both accuracy and practicality in incentives;
- **Value stacking:** energy users need to be able to combine multiple value streams, including wholesale, network and system services;
- **Access to experts and data:** allowing energy users to seamlessly be serviced by multiple parties to help them manage their energy use. This covers issues such as access to data and allowing multiple Financially Responsible Market Participants (FRMPs) to service a single connection;
- **Competition:** ensuring that there is competition in energy market services, especially in relation to network services and non-wires alternatives; and
- **Governance:** the key to implementing the principle of *'Energy Efficiency First'* will be both considering it in the Post 2025 market design process, but also embedding it in governance systems so that energy policy and markets deliver the lowest cost mixture of supply-side and demand-side investments.

The EEC commends that the ESB's leadership in looking to the future of the electricity sector and looks forward to continuing to work with the ESB. 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
Energy Security Board
Post 2025 Market Design Consultation Paper

19 October 2020

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Resource Adequacy Mechanisms (Section 4)

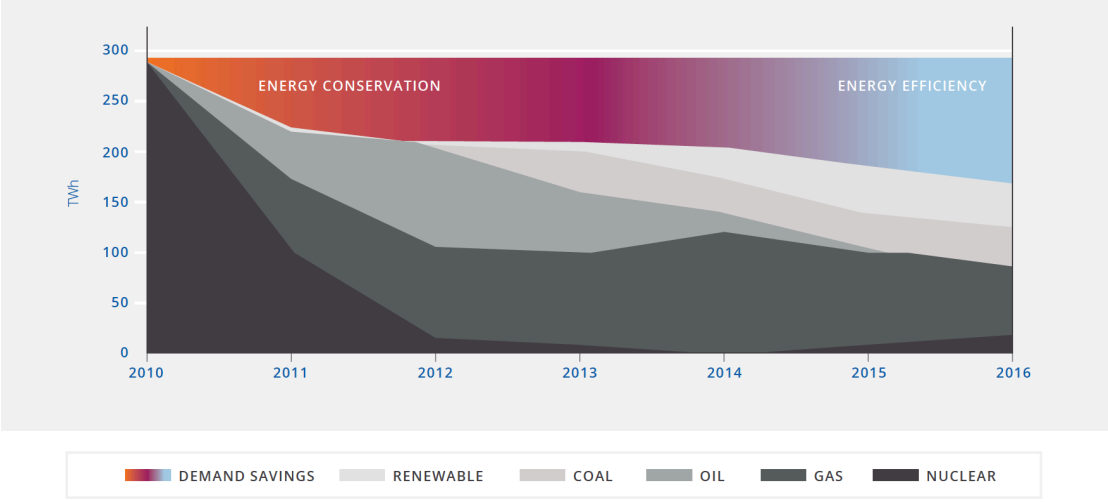
The EEC believes that there is a need to consider resource adequacy. Put simply, the wholesale energy market provides a strong incentive to develop and dispatch capacity that is called upon on a regular basis. However, the combination of the price cap and the private sectors' natural reluctance to invest in capacity that may never be called upon means the wholesale market may not deliver sufficient capacity for situations that occur rarely (e.g. extreme peaks in demand combined with loss of transmission capacity).

The EEC agrees that there is an *a priori* case for examining whether there is a need for a system that effectively pays for this rarely-needed capacity on an 'insurance basis', as the price of this capacity will be dramatically lower if the market effectively takes on the risk of it not needing to be dispatched. The EEC does not yet have a position on whether this system is ultimately necessary, nor what would be the preferred mechanism for ensuring resource adequacy.

Ageing Thermal Generation (Section 5)

Managing energy use can rapidly deliver large amounts of capacity to help ameliorate the impact of removing aging thermal generation. In 2011-12 Japan effectively closed its entire fleet of nuclear generators, removing about 30 per cent of its electricity generation capacity in a little over a year. While Japan invested in a range of generation technologies to make up this shortfall, by far the largest form of capacity that it added to the market was energy management, with Japan creating about 100 TWh of additional annua energy savings in just six years.

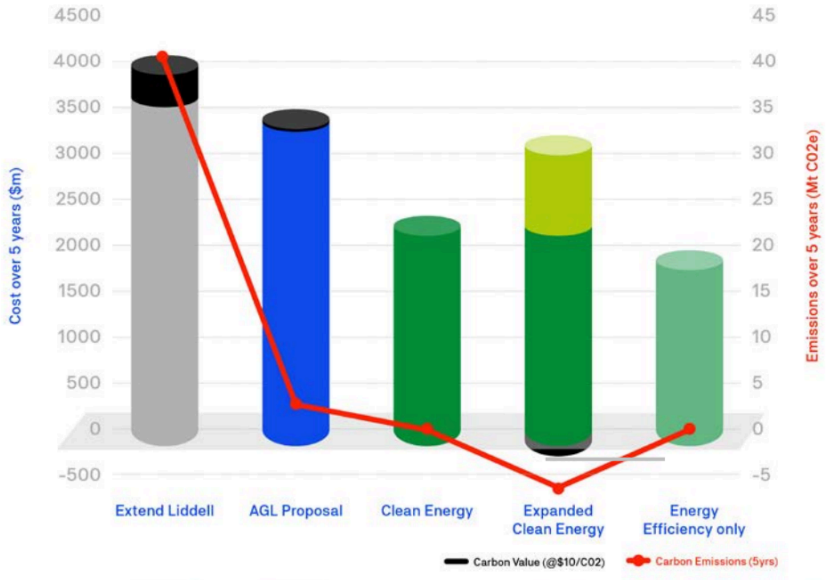
Figure 1. Replacement of nuclear electricity generation in Japan



Source: International Energy Agency 2017, *Energy Efficiency 2017*, IEA, Paris.

Locally, the Institute of Sustainable Futures conducted modelling in 2017 that found that the cheapest way to provide sufficient capacity to meet the loss of Liddell's capacity was energy efficiency. In summary, whatever mechanism is considered for addressing aging fleets needs to consider both supply- and demand-side approaches.

Figure 2. Cost and emission comparisons of options to replace Liddell



Source: Institute of Sustainable Futures 2017 Beyond Coal: Alternatives to Extending the Life of Liddell Power Station, Institute of Sustainable Futures, Sydney.

Essential System Services (Section 6)

A functioning electricity system requires a range of services that are not valued by the wholesale electricity market, including inertia, frequency response and, as discussed in Section 4, adequate capacity for contingencies. The EEC supports the ESB's position that many of these services are not properly incentivised in the NEM, and this will become a serious issue as the mix of generation technologies in the NEM changes.

The EEC generally favours incentivising services by developing markets that are as open as possible, as this supports diversity and competition. The success of this approach can be seen in the opening up the Frequency Control and Ancillary Services (FCAS) market to demand response and batteries, which lead to a rapid drop in the price of FCAS. While there are occasions where non-market approaches are more efficient, the EEC generally recommends that non-market approaches only be pursued where it can be demonstrated that it will be much more efficient than market-based approaches.

The EEC and its members support the development of a fast frequency control market, and are still considering the range of other market designs proposed in the consultation paper.

Scheduling and Ahead Mechanisms (Section 7)

Energy management can deliver capacity at a variety of timeframes, with automated demand response able to dispatch under 3 seconds, some forms of manual demand response requiring an hour to prepare and some only able to dispatch with significant notice (e.g. factories scheduling their maintenance to occur during periods of peak demand).

The EEC notes that ahead mechanisms can help the development and dispatch of demand-side capacity that takes longer to prepare, as energy users require both advanced notice and confidence that their demand response will be valued if dispatched. Accordingly, some of the international electricity markets with large volumes of demand response participation include ahead mechanisms.

However, the EEC and its members are still considering whether ahead mechanisms would, on balance, be of benefit in the current context of the NEM.

Two-Sided Market (Section 8)

The EEC welcomes the ESB strongly championing measures to unlock the potential for demand response and the EEC remains open to exploring the potential impacts of a two-sided market. However, the EEC is still considering the merits of a two-sided market and a two-sided market will not be a panacea for the barriers facing energy management.

The EEC would prefer if the ESB expanded its work on a two-sided stream into a stream on 'unlocking the potential for energy management', which ideally adopts the principle *'Energy Efficiency First'* and looks at a number of the issues faced by energy users, such as:

- **Technology neutrality:** The EEC supports the principle of technology neutrality, but all too often this has meant designing energy markets around the capabilities of specific supply-side technologies (e.g. coal-fired generators) and expecting other technologies with different pros and cons to match these capabilities. True technology neutrality should involve considering; the market's actual needs; the features and challenges facing various technologies; and what systems would dispatch the optimal mix.
- **Incentives:** All energy users should be able to seamlessly face incentives to manage demand, regardless of their current retail arrangements. This is the key to the Wholesale Demand Response Mechanism (WDRM) - it offers energy users a very low barrier to entry if they want to *try* demand response. Currently, energy users need to become spot exposed or have a major change to their retail plan to even *try* demand response. In other words, we need to consider both accuracy and practicality in incentives;
- **Value stacking:** energy users need to be able to combine multiple value streams, including wholesale, network and system services;
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Question 1. What do you consider are the risks and opportunities of moving to a market with a significantly more active demand side over time? How can these risks be best managed?

Demand for electricity already varies significantly - consumers demand far less electricity overnight and during mild weather, and far more during the evening and on hot and cold days. These variations in demand create significant challenges that grid operators have needed to manage since the inception of electricity systems.

With active management of energy demand, consumers are responding to price signals or other drivers in ways that deliver benefits to both the consumer and the energy system. As long as price signals are reasonably accurate, active energy it is almost entirely upside for the energy market and consumers.

Active management of energy demand already delivers significant benefits to the grid, but could deliver even more:

- Low-cost and reliable capacity through energy efficiency, demand response and load-shaping (the IEA has identified energy management as the single largest source of capacity in energy markets);
- Support for the transition to clean generation, by better matching demand with supply and providing energy security services; and
- Affordability for energy services. It is critical to note that, while energy management can and does reduce the price per unit of energy, consumers are far more concerned about their overall bill, which incorporates both the cost per unit of energy and total energy consumption. A survey from 2018 found that only 11 per cent of households nominated the price per unit of electricity as their primary concern, while 79 per cent of households were primarily concerned with their total bill.[6]

Therefore, the key risk is that we fail to significantly tap the potential for energy management. Accordingly, any policy measures should:

- Prioritise delivering energy management over theoretical precision. For example, requirements to firmly schedule demand management will dramatically reduce the volume of demand management. The benefits of avoiding unscheduled demand response will be outweighed by the costs of losing extremely valuable energy management; and
- Deliver reasonably accurate price signals to consumers and their intermediaries, noting the point above that excessive focus on precision with price signals could create significant barriers to participation;
- Enable energy users to engage with experts; and
- Properly consider how supply and demand interact. For example, the failure of various energy organisations (including networks and regulators) to take account of the entirely foreseeable reduction in demand growth that occurred after 2008 resulted in overinvestment in networks and electricity prices that were much higher than they needed to be.

Question 2. What are the barriers preventing more active demand response and participation in a two-sided market? What are the barriers to participating in the wholesale central dispatch processes?

[6] ACOSS, EEC and Property Council of Australia 2018, Energy bills and energy efficiency - Survey of Community Views.

To effectively manage demand, consumers require:

- Price signals that either incentivise them, or an intermediary (e.g. aggregator) to manage their energy use;
- Support from various experts to help them optimise their energy use. Managing energy use can be complicated, and basic information economics demonstrates that it is far more cost-effective and effective for experts to help multiple consumers rather than expecting each energy consumer to become an expert in energy management. This means that there should be limited barriers for consumers engaging experts;
- Markets and systems to enable experts to aggregate energy management across multiple sites, in order to deliver emergent benefits such as avoided network investment. It is exceptionally complicated for energy users to try to coordinate themselves to deliver this kind of benefit; and
- Reducing barriers to participation.

Question 3. Do you think any other near term arrangements or changes to the market design can be explored in this workstream?

Yes – see earlier statements

Question 4. What measures should be deployed to drive consumer participation and engagement in two-sided market offerings, and what consumer protection frameworks should complement the design?

No comment at this time

Question 5. What might principles or assessment criteria contain to help assess whether it is timely and appropriate to progress through to more sophisticated levels of the arrangements?

No comment at this time

Question 6. The ESB is considering combining the DER integration (below) and two-sided markets workstreams, or elements thereof. Do stakeholders have suggestions on how this should be done?

As noted earlier, we recommend that the ESB expand its work stream on two-sided market into a specific workstream on energy management. While there are overlaps between these issues and the issues facing distributed generation and batteries, if energy management is rolled in with other distributed resources extra care will be required to avoid excessive focus on distributed generation.