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Chair, Standing Committee on the Environment and Energy  
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28 April 2017

**Re. Inquiry into Modernising Australia’s Electricity Grid**

Dear Mr Broad

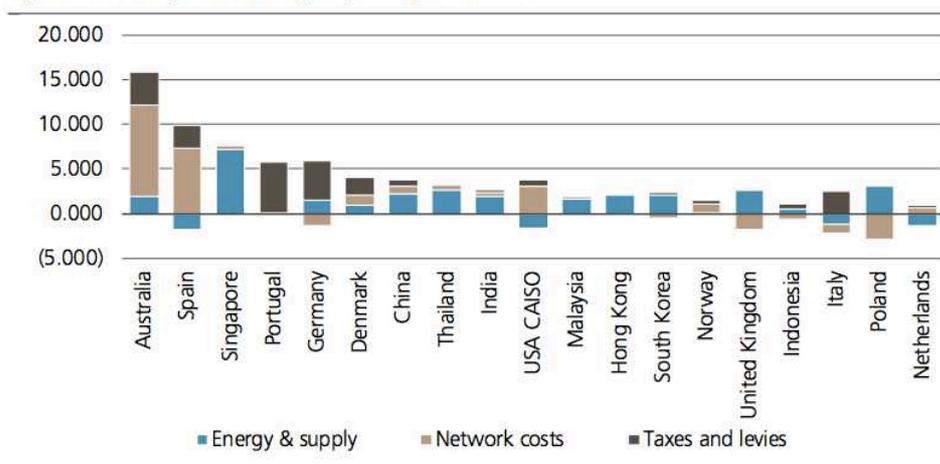
Thank you for the opportunity to provide a submission to the Inquiry into Modernising Australia’s Electricity Grid (hereafter referred to as ‘the Inquiry’).

The Energy Efficiency Council is the peak body for energy efficiency, demand management and cogeneration in Australia. The Council is a not-for-profit membership association, and its goal is to make sensible, cost-effective energy management measures standard practice across the Australian economy. Our members include independent experts, energy efficiency providers and various levels of government.

Network Service Providers (NSPs) should invest in a mixture of network infrastructure and demand management in order to deliver the lowest cost services to consumers. This is a well-accepted principle in the management of the National Electricity Market (NEM)<sup>1</sup>, but the rules and regulations have resulted in under-investment in demand management and this contributed to over-investment in network infrastructure.

As a result, network prices in Australia increasing in real terms by 120 per cent in NSW and 140 per cent in Queensland between 1997 and 2013<sup>2</sup>. International research by UBS found that, between 2007 and 2013, network costs rose faster in Australia than any other country they examined.<sup>3</sup>

**Figure 5: US cents per kWh change in power prices 2007-13**



Source: Power utility companies, government databases, UBS estimates

<sup>1</sup> In this submission the ‘NEM’ is used to refer to the full suite of regulations, markets and infrastructure that comprise the electricity sector in the NEM region, not just the wholesale electricity market.

<sup>2</sup> EY 2014, *Electricity network services: Long-term trends in prices and costs*.

<sup>3</sup> UBS 2014, *Global Power Utilities - Rising power tariffs create a risk of regulatory intervention*

There is a significant opportunity to lower network costs and deliver a fairer, more flexible grid that can adapt to the changes underway by reforming the NEM rules and regulations to encourage demand management.

The Energy Efficiency Council has developed a comprehensive range of recommendations to improve demand-side activity, which are set out in the Australian Energy Efficiency Policy Handbook ([www.eec.org.au/policy-advocacy/handbook](http://www.eec.org.au/policy-advocacy/handbook)). However, we recommend that the Inquiry make five major recommendations:

### **1. Energy management is critical for the future of the NEM**

Demand-side issues have historically been given much less attention than supply-side issues. To ensure that governments direct sufficient attention to demand-side issues, the Inquiry needs to explicitly emphasise that energy management is essential to the security, affordability and sustainability of the NEM.

### **2. Regulations must require NSPs to invest in economic demand management**

The rules and regulations of the energy market need to ensure that NSPs plan, invest and operate efficiently and are remunerated at an appropriate level. In addition to general economic efficiency, the rules should ensure that NSPs invest in reducing demand when it is cheaper than network augmentation.

The Australian Energy Regulator is currently reviewing the Demand Management Incentive Scheme (DMIS), and we recommend the Inquiry adopt our recommendations to the DMIS review (Appendix A), which includes:

- A price signal to:
  - Overcome the distortions that favour expenditure on network infrastructure over expenditure on demand management; and
  - Reward NSPs and third parties for non-network benefits.
- Setting NSPs minimum targets for demand management activity, in addition to a requirement for NSPs to report demand management metrics.

### **3. Independent oversight of NSPs' interactions with consumers and other parties**

NSPs are monopolies but individual consumers, generators and demand-side providers are expected to negotiate with NSPs on the costs for connection to the network and/or payments for projects that reduce the need for network expenditure. Governments should appoint an individual to provide active oversight of interactions between NSPs and third parties.

### **4. Trial new energy market structures in a number of regional towns**

Trying to change the NEM rules and regulations incrementally will be extremely slow and challenging. We recommend that governments trial new business models in small regions, in conjunction with communities, regulators, NSPs, retailers, generators and other parties.

### **5. Fair and efficient electricity tariff structures**

Tariff structures must be fair and encourage the right balance of investment in energy supply, networks and demand reduction.

The attached submission discusses these issues in more detail.

If you have further questions please contact Luke Menzel, CEO of the Energy Efficiency Council, via

Yours sincerely

Rob Murray-Leach

Head of Policy

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**Submission to the Standing Committee on the  
Environment and Energy Inquiry into  
Modernising Australia's Electricity Grid**

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## 1. The Role of Demand Management in Networks

Homes and businesses don't directly consume electricity and gas - they use it for 'energy services' such as warm showers, cool homes and computing. If consumers manage their demand it reduces the amount of electricity they need to deliver these energy services. For example, an LED light delivers the same light (service) as an old 'incandescent' bulb with around 80 per cent less energy.

The cheapest way for a home or business to meet its need for energy services is through a combination investment in 'supply' (electricity) and 'demand management'. For example, the cheapest way to keep an off-grid home well-lit is a balance of investment in generation (e.g. solar PV) and energy efficiency (e.g. LED lighting). If the homeowner buys cheaper inefficient lights, they will need to invest more in energy supply.

While it is more complex to achieve the right balance of investments in supply and demand management across the many energy users and generators connected to the grid, the principle is the same. We want the most cost-effective mix of investment in supply and demand-side measures to deliver the services people want.

Electricity networks perform a vital service. Networks do not 'provide' electricity per se – they link electricity users to generators, and connect multiple users and generators together in ways that improve the affordability and reliability of energy services. For example, connecting users to multiple generators increases the reliability of supply, and connecting multiple users to generators creates a more stable pattern of demand.

The cheapest way for an NSP to deliver secure connection is through a balance of investment in infrastructure (poles and wires) and demand management. For example, if peak demand in a suburb is increasing rapidly, the NSP might have the option of either spending \$10 million to upgrade a substation or \$5 million on a program to reduce peak demand (e.g. offering a local warehouse money to reduce demand during peak periods).

The NSPs should choose the 'demand-side option' if it can deliver network services to an area more cheaply than the 'supply-side' option, as that will meet energy users' need at lower costs. The choice will vary depending on the situation – sometimes the supply-side option is cheaper, sometimes the demand-side option is cheaper.

At the moment demand-side options are even more attractive. Demand-side options typically have a much shorter payback period (e.g. under 5 years) than network infrastructure (e.g. 10-30 years). Given the uncertainty about future patterns of energy demand and supply, there is significant risk that network assets will become obsolete, resulting in wasted investment. Energy management therefore gives us much more flexibility to adapt to changes in our energy system, sometimes termed 'options value'.

The use of 'demand-management' to reduce network expenditure is not just theory. For decades Australian NSPs have offered homes much lower tariffs for 'off-peak' water heaters, in order to move smooth out demand for electricity and reduce peak demand, which reduces expenditure on the grid and therefore electricity prices.

NSPs in Queensland already offer homes lower tariffs if they are willing to have load-control installed on their air conditioners. This means that, during periods of peak demand, the NSP can slightly reduce the energy consumption of air conditioners without affecting household comfort. Again, this reduces peak demand, the cost of the network and therefore electricity prices.

However, the level of demand management in Australia is substantially lower than global best practice. Many NSPs in the US, Europe and New Zealand undertake much more demand management than Australian NSPs. This means that Australian NSPs have spent much on network infrastructure than they needed to, raising bills for energy consumers. As noted, international research by UBS found that, between 2007 and 2013, network costs rose faster in Australia than any other country they examined.<sup>4</sup>

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<sup>4</sup> UBS 2014, *Global Power Utilities - Rising power tariffs create a risk of regulatory intervention*

## 2. The Myth of Oversupply

There is a myth that increased energy efficiency will result in excess capacity in the market and therefore increased electricity bills. There are three clear counters to this:

- **Sunk network costs are fixed.** The total cost of supply would not be increased by reduced consumption. While a declining number of energy users would mean that these costs are shared between fewer users, reduced consumption by the same number of users would not increase the cost per user. It is true that the way network charges are structured changes the way that costs are shared amongst energy users, however this simply highlights the importance of tariff design.
- **Reduced demand reduces the need for network augmentation.** Declining peak demand will reduce the pressure for further investment in the network (including the size of replacement assets), reducing network costs over time.
- **Short-term periods of over- or under-supply should not dictate policy.** In 2014 some commentators argued that the oversupply in generation meant that investment in renewable generation and energy efficiency should be wound back. Two years later Australia is facing undersupply issues. Fuel switching and the emergence of new technologies – such as electric vehicles – could result in even more significant undersupply, making energy efficiency even more valuable. This highlights that energy market policy must be based on first principles and long-term costs for energy users.

### 3. Other Benefits of Demand Management

Demand-management also delivers other benefits to the electricity system. These include:

- **Emergency Capacity**  
In February 2017 supply shortages during a heat wave meant that power was cut to over 90,000 South Australian homes and businesses. NSW would have also had to cut electricity supply to energy users, but this crisis was averted because AGL and the NSW Government reduced demand (rather than cutting supply) at a number of sites.
- **Reduced wholesale electricity costs**  
Reducing demand during peak periods can significantly reduce the wholesale cost of energy. In several overseas markets energy users can bid 'demand response' (reducing demand during peak periods) into the electricity market. This is both cheaper than building generators just for a handful of extreme 'peak' hours each year and acts as a form of competition for energy supply during peak periods, placing downward pressure on costs for consumers.
- **Energy supply stability**  
Electricity supply needs to be kept at particular frequencies for grid stability. Demand management can be used to provide these 'Frequency Control Ancillary Services' (FCAS) at very low costs. In New Zealand demand management typically provides over 70 per cent of FCAS – in Australia it's less than 2 per cent. This means that we're relying on more expensive forms of FCAS, which pushes up costs for energy consumers.

Encouraging demand-management for network services will also mean that it is available to provide these other forms of service, which means that it will deliver multiple benefits for the energy market. Demand management is becoming more important due to the increase in variable forms of generation (e.g. wind and solar PV) and changes in energy users consumption patterns.

This means that encouraging demand-management for network services will deliver benefits to every aspect of the 'Energy Trilemma':

- **Security:** Demand management can deliver emergency capacity, increased supply stability and grid stability reducing the impact of peak demand on networks. Demand management is vital to support the integration of intermittent generation, as it allows demand to be rapidly adjusted to variable supply.
- **Affordability:** Demand management will lower the cost of supply and enable consumers to get more out of each unit of energy that they consume. This will lower consumers' bills and boost productivity.
- **Sustainability:** Energy efficiency can rapidly and affordably deliver around half the emissions abatement potential in Australia's energy sector.

Energy management is not a silver bullet, and will need to be coupled with supply-side reforms to ensure that the NEM is as secure, affordable and sustainable as possible. However, demand-side reforms would enable the rapid deployment of mature technical solutions that would provide both short- and long-term benefits to the NEM.

## 4. Reform is Essential

The rules, regulations and governance of the NEM have resulted in overinvestment in supply and under-investment in demand-side activities. For example:

- NSPs are monopolies that operate under incentives set by regulators. These incentives have created significant incentives to invest in grid augmentation and underinvest in demand-management.
- Electricity tariffs and charges don't reflect the real long-term costs of supply, which reduces the incentive for energy management. For example, it has been estimated that a 2 kW air conditioner that costs a consumer around \$1,500 to install would impose system costs of up to \$7,000, which are spread across all consumers.<sup>5</sup> The lack of an appropriate price signal to reflect the true costs of air conditioners (such as a charge at the point of installation or a critical peak charge) was a major contributor to rapid growth in peak demand in the late 1990s and early 2000s.

These issues are well-known. In 2002 Warwick Parer, a former Coalition Energy Minister, led a review of the NEM for COAG<sup>6</sup>, which concluded 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."*

A range of other distortions in our electricity systems, including supply side biases, have been identified in the Productivity Commission's *'Inquiry into Electricity Network Regulation'* and Senate Committee Inquiries in 2012 into *'Electricity Prices'* and in 2014 into *'The Performance and Management of Network Companies'*.

These distortions contributed to recent increases in electricity bills. Of particular note, between 2008 and 2013 NSPs spent over \$35 billion on network infrastructure, which contributed to electricity bills rising by more than 70 per cent in many parts of the NEM. These biases have still not been resolved, and some have actually become worse.

For example, tariff structures are critical to encourage the mix of investments in generation, networks and demand reduction that deliver affordable energy. There is a strong case for reforming electricity tariffs to encourage consumers to reduce their electricity at peak times. However, several NSPs have used recent tariff reviews to introduce tariff structures with much higher fixed components. These high fixed charges increase NSPs' revenue certainty but do not reflect the genuine long-run costs of infrastructure, which discourages investment in demand reduction.

The rapid global transformation in the energy sector has added further pressure for energy market reforms. Changes in consumer preferences and the costs of various technologies (such as energy storage) mean that our energy system will look radically different in 2030. Governments must ensure that the transition occurs in a way that is cost effective, fair and benefits consumers. This will require fundamental changes to the way the electricity sector operates.

<sup>5</sup> Australian Government 2012, *Energy White Paper 2012*.

<sup>6</sup> COAG Energy Market Review 2002, *Towards a Truly National and Efficient Energy Market*.

## 5. Key Areas for Reform

The Energy Efficiency Council recommends that the Inquiry discuss the following:

### **The economic efficiency of electricity networks and demand-side investment**

The current regulatory framework for electricity networks has resulted in overinvestment in networks, high returns for NSPs and rapid increases in energy bills. The rules and regulations of the energy market need to ensure that NSPs plan, invest and operate efficiently and are remunerated at an appropriate level.

In addition to general economic efficiency, the rules should ensure that NSPs invest in reducing demand when it is cheaper than network augmentation. The network planning process should require NSPs to report on overall levels of demand-side management. NSPs should be set targets for demand-side investment and the Demand Management Incentive Scheme (DMIS) must be a genuine incentive to reduce demand (e.g. encouraging demand-side works when they can reduce the cost of replacing ageing assets). The Australian Energy Regulator is currently reviewing the DMIS, and we recommend the Inquiry adopt our recommendations to the DMIS review (Appendix A).

### **Independent oversight of NSPs' interactions with consumers and other parties**

NSPs are monopolies but individual consumers, generators and demand-side providers are expected to negotiate with NSPs on the costs for connection to the network and/or payments for projects that reduce the need for network expenditure. Governments should appoint an individual (potentially within an existing market body) to provide active oversight of interactions between NSPs and third parties. This would include gathering and reviewing information on the speed of NSP negotiations on matters such as connection and the charges or payments resulting from negotiations.

### **Trial new energy market structures in a number of regional towns**

Trying to change the NEM rules and regulations incrementally will be extremely slow and challenging. We recommend that governments trial new business models in small regions, in conjunction with communities, regulators, NSPs, retailers, generators and other parties. The aim would be to develop more economically efficient market structures that better suit new technologies (e.g. PV, storage and mini-grids). Due to the higher cost of supply in regional areas, trials in these areas are likely to offer substantial benefits to consumers. While some government funding would be required to support innovation and de-risk these trials for consumers, the aim would be to develop economically efficient market structures that do not need government funding.

### **Fair and efficient electricity tariff structures**

Tariff structures must be fair and encourage the right balance of investment in energy supply, networks and demand reduction in order to deliver lower bills to consumers. However, there is very little guidance about what tariffs should look like. The COAG Energy Council should set up a national process, similar to CSIRO's Future Grid, to bring a wide range of consumers, suppliers and NSPs together to develop model tariff structures that are fair to energy consumers and encourage economically efficient investment. These model tariff structures don't need to be mandatory but should guide tariff design by NSPs and reduce the duplication resulting from each NSP having to consult from scratch.

## Appendix A – Submission to the DMIS review

20 April 2017

### Re. Demand Management Incentive Scheme and Innovation Allowance Mechanism

Dear Ms Conboy

Thank you for the opportunity to provide a supplementary submission on the Demand Management Incentive Scheme (Scheme) and Innovation Allowance Mechanism (Allowance Mechanism). This submission should be read in conjunction with the Energy Efficiency Council (EEC)'s previous submission.

The EEC is the peak body for energy management. The Council is a not-for-profit membership association, and its goal is to make sensible, cost-effective energy management measures standard practice across the Australian economy. Our members include independent experts, businesses and various levels of government.

The Australian Energy Regulator (AER) must put in place a substantial Scheme and Allowance Mechanism, in order to drive investment in demand management and reduce expenditure on network infrastructure. This is critical to meet the National Electricity Objective (NEO), *“to promote efficient investment in, and efficient operation and use of, electricity services for the long-term interests of consumers...”*.

The EEC is extremely concerned that the AER appears to be considering only modest strengthening of the existing Scheme. If the AER fails to put in place a material Scheme there is a high likelihood that several States and Territories will introduce their own mechanisms to force or encourage Network Service Providers (NSPs) to invest in demand management.

There is widespread concern among governments, experts and consumers that NSPs have overinvested in network infrastructure and underinvested in non-network solutions, and this has contributed to rapid escalation in network prices. Network prices have increased rapidly in Australia – in real terms by 120 per cent in NSW and 140 per cent in Queensland between 1997 and 2013<sup>7</sup>. International research by UBS found that, between 2007 and 2013, network costs rose faster in Australia than any other country they examined<sup>8</sup>.

During the AER's forum on the Scheme and Allowance Mechanism on 6 April 2017, there were a number of arguments expressed for only weakly enhancing the current Scheme, which could be summarised as:

- The regulatory problems around NSPs have either already been addressed or will be shortly addressed (e.g. shifting to a Total Expenditure (TotEx) model); and
- Concerns that a strong Scheme will result in overinvestment in demand management.

The EEC strongly rejects both of these arguments, and believes that a strong Scheme and Allowance Mechanism are essential.

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<sup>7</sup> EY 2014, *Electricity network services: Long-term trends in prices and costs*.

<sup>8</sup> UBS 2014, *Global Power Utilities - Rising power tariffs create a risk of regulatory intervention*

## Regulatory Problems

It is clearly incorrect to suggest that there are either no regulatory problems that encourage NSPs to underinvest in demand management, or that these problems have already been addressed. Extensive reviews by the Australian Energy Market Commission, Productivity Commission and several Senate Committees have identified major distortions in the regulatory system, and the majority of these distortions have yet to be addressed.

Given the pace of reform in energy regulation, it is also highly unlikely that the many problems in the economic regulation of NSP will be resolved in the near future.

Furthermore, even if the suite of policies that are being considered are introduced, this will not resolve all the distortions that lead to overinvestment in network infrastructure and underinvestment in non-network solutions. For example, the EEC supports the introduction of more cost-reflective network tariffs, but the introduction of nodal pricing is highly unlikely and, even with genuinely cost-reflective tariffs, without an incentive for action by NSPs, it would be almost impossible for consumers to independently coordinate demand management activities to avoid or defer network investment.

## Risk of over-incentivising demand management

Given most NSPs' cultural bias against demand management, the risk of NSPs undertaking too much demand management is negligible.

More critically, the AER will assess NSPs' demand management proposals to determine whether they are cost-effective at meeting consumers' needs. If the AER's processes are appropriate, this will ensure that only cost-effective demand management projects proceed, and should mitigate the risk that NSPs overinvest in demand management.

The remaining concern is whether NSPs will be over-rewarded for undertaking demand management. This issue can be effectively dealt with in the Scheme design, and the level of reward for demand management is likely to be non-material for consumers' bills in comparison to the level that NSPs have been excessively rewarded for investment in network infrastructure. Therefore, applying extreme caution to the level of incentive for demand-management would be a case of misguided priorities.

## Design of the Scheme and Innovation Allowance

A strong Scheme and Innovation Allowance are required to address three separate issues:

1. Correcting of distortions in the current rules and regulations that make it more attractive for NSPs to invest in networks infrastructure than demand management
2. Rewarding networks for the externality benefits of demand-management (e.g. reduced wholesale electricity prices)
3. Reforming NSPs' cultures and capabilities, which encourage investment in network infrastructure over demand management.

While ideally regulatory distortions would be addressed through correction of the rules, and externalities would be addressed through the development of healthy markets for those services, in practice both of these will take years to implement and develop.

Therefore, the EEC supports the development of a Demand Management Incentive Scheme. There is no single tool that can perfectly address the three issues identified. Therefore, the EEC recommends that the Scheme include:

- A price signal to:
  - Overcome the distortions that favour expenditure on network infrastructure over expenditure on demand management; and
  - Reward NSPs and third parties for non-network benefits.

This incentive would ideally be based on outcomes delivered (e.g. peak demand reduction) rather than output (e.g. size of investment).

- Minimum targets for demand management activity by NSPs, in addition to a requirement for NSPs to report demand management metrics.

The EEC does not have detailed recommendations on the level of incentive or size of the target at this time, and looks forward to reviewing a proposal from the AER.

The EEC provided recommendations on the Innovation Allowance in its last submission.

Within these broad boundaries, we note that there is a significant risk of the 'perfect being the enemy of the good'. Most developed jurisdictions in the world have mechanisms that require NSPs to invest in demand management when it is more cost effective than building network assets. While some of these mechanisms are crude, they have resulted in a more cost-effective mixture of demand-side and supply-side investment, reducing costs for consumers.

The absence of an effective Demand Management Incentive Scheme has driven up electricity costs for consumers. Continuing to delay the introduction of an effective Scheme will result in further inefficient investment and higher costs for consumers.

## Summary

The EEC recommends that the AER introduce a strong, material Demand Management Investment Scheme and Innovation Allowance as soon as practicable. If the AER does not introduce an effective scheme it will likely contribute to the further fracturing of a national approach to electricity regulation.

We look forward to being involved in this process as it proceeds. Your office can contact me on \_\_\_\_\_ or via \_\_\_\_\_

Yours sincerely

Rob Murray-Leach

Head of Policy  
Energy Efficiency Council