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23 March 2017

Re. NSW Energy Security Taskforce

Dear Professor O'Kane

Thank you for the opportunity to provide a submission to the NSW Energy Security Taskforce. Given the linkages between the role of the Taskforce and the *Independent Review into the Future Security of the National Electricity Market*, I have attached our submission to the Review, which highlights key issues for the Taskforce to consider.

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.

The supply-side and demand-side of NSW's energy system and are not separate stories - they are two halves of the same story. The most cost-effective way to meet NSW's demand for energy services is a balance of investment in supply-side and demand-side activities, including generation, networks and demand-management.

However, the National Electricity Market[1] (NEM) has a strong supply-side bias, which means that Australia is currently tapping just a fraction of its demand-side potential. Australia's energy efficiency and rate of energy efficiency improvement are well below the OECD average, and the level of demand-response is substantially below global best practice for provision of both capacity and Frequency Control Ancillary Services (FCAS). This reduces energy security, increases energy bills and inflates greenhouse gas emissions.

Improving the way that we use energy is essential to support the shift to new forms of generation, and will deliver benefits to every aspect of the 'Energy Trilemma':

- **Security:** Demand response can deliver both short-term capacity and FCAS, typically at much lower costs than supply-side solutions. Demand response is particularly critical to support the integration of intermittent generation, as it allows demand to be rapidly adjusted to variable supply.
- **Affordability:** Energy efficiency and demand response 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.

[1] 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.

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However, significant energy market reforms and complementary policies will be required to address the barriers to demand-side activities and unlock their full potential.

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. These reforms would provide immediate relief to security issues but also avoid unnecessary investment and buy time to enable a more comprehensive suite of demand- and supply-side reforms.

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). However, it is crucial that the Review make recommendations on four key matters:

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 Taskforce needs to explicitly emphasise that energy management is essential to the security, affordability and sustainability of the NEM.

2. **COAG Energy Council establish an urgent *'Demand Response Review'***

   The most urgent issue for both security and affordability in the NEM is the deployment of transparent demand-response for emergency capacity, FCAS and affordable peak demand. If there had been an effective market for these services in February 2017, broad-scale load-shedding in South Australia and targeted load-shedding in NSW could have been avoided, and prices across the NEM moderated.

   The *Demand Response Review* should aim to identify and design a range of national and state-based options to unlock the potential of demand response, and recommend preferred options for rapid implementation. The Review should be supported by a roundtable including representatives of energy consumers (e.g. Energy Consumers Australia, Energy Users Association of Australia and Australian Industry Group), energy management experts and the broader energy sector.

   If the COAG Energy Council does not urgently set up a suitable *Demand Response Review*, we recommend that NSW establish its own Review. This could be linked to work currently being undertaken by the NSW Government under the *Climate Change Fund Draft Strategic Fund 2017-22 (*Action 3.7 – Reduce peak demand through battery storage and energy efficiency).

3. **COAG Energy Council establish a separate *'Energy Productivity Taskgroup'***

   There is a broad range of energy management issues that are important but less urgent than those that a *Demand Response Review* needs to consider, including electricity tariff structures, demand-management to lower network costs and cogeneration. These measures sit under the National Energy Productivity Plan (NEPP) but require ongoing funding and attention from the COAG Energy Council to realise. As with the *Demand Response Review*, this Taskgroup should be supported by a roundtable of consumers and energy experts.

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The NSW Government is currently considering a range of energy productivity measures as it finalises the *Draft Plan to Save NSW Energy and Money*. The EEC strongly endorses the *Draft Plan* and encourages the NSW Government to maintain and build on the ambition set out in the *Draft Plan* as it is finalised.

4. **Governance reform**

   The NEM's governance structures are not designed to facilitate the rapid reforms that are necessary to respond effectively to ongoing transformation in energy technologies and markets. The Taskforce should recommend substantial governance reform, including increasing key institutions' demand-side capability and focus and establishing a *National Energy Efficiency and Productivity Agency.*

The attached submission discusses these issues in more detail.

The Energy Efficiency Council seeks a meeting with you and the Taskforce to discuss key demand-side issues. I look forward to discussing these matters with you soon. Your office can contact me on 0414 065 556 or via rob.murray-leach@eec.org.au.

Yours sincerely

Rob Murray-Leach

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COUNCIL

Energy Efficiency Council submission to the Independent Review into the Future Security of the National Electricity Market

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1. Energy efficiency, demand response and cogeneration

'Demand-side' services include energy efficiency, demand response and cogeneration. The term 'demand management' is an umbrella term that includes energy efficiency and demand response.

Energy efficiency means getting more services for less energy and can reduce both energy consumption and peak demand. Homes and businesses don't directly consume electricity and gas - they use it for 'energy services' such as warm showers, cool homes and computing. The cheapest way for a home or business to meet its need for energy services is through a combination of supply-side and demand-side investments.

For example, the cheapest way to keep an off-grid home cool in summer is a mix of investment in supply (a generator) and demand-side measures (e.g. insulation and an efficient air conditioner). If the owner under-invests in insulation and air conditioner efficiency, they will need to invest much more in energy supply. It's also possible to over-invest in efficiency – it's all about finding the right balance.

While it is more complex to achieve the right balance of investments 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.

Demand response means adjusting energy use patterns to lower costs, and includes:

- Moving energy use from periods of high demand or low supply to times when supply is plentiful. This ensures that supply is maintained for critical needs whilst reducing the need for expenditure on networks and peaking generators. For example, in much of the US, large energy users are offered payments to reduce demand (e.g. during heat waves to accommodate air-conditioner loads).
- Small rapid changes in demand to provide services to stabilise the grid e.g. Frequency Control and Ancillary Services (FCAS).

Recent advances in technology have significantly increased the potential for demand response. In the past, demand response was often limited to either single technologies (e.g. off-peak water heaters) or very large energy users. During a recent heatwave in NSW, a smelter had its supply reduced by a retailer in order to avoid widespread involuntary load shedding.

New technologies allow much more sophisticated and substantial demand response. For example, automated systems enable networks and aggregators to remotely reduce energy use across hundreds of commercial sites in ways that don't materially impact any sites (e.g. rapidly cycling refrigeration compressors on and off). Aggregators can combine many different forms of demand response from many sites together into 'portfolios' that provide flexible, secure and stable demand response. Demand response is therefore able to compete with storage and generation for a range of sophisticated services.

Cogeneration is the process of generating both electricity and thermal energy (heating and/or cooling). Cogeneration is significantly more efficient than standard generators, because the 'waste' thermal energy is used to provide services. In addition, cogeneration systems are typically within the distribution network, so they significantly reduce the load on the network, and typically have a very rapid ramp rate.

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2. Demand-side activities are critical for the NEM

Increased levels of energy efficiency, demand response and cogeneration in Australia would help respond to every aspect of the 'Energy Trilemma', improving security and affordability while reducing emissions. Energy efficiency and demand response also deliver benefits for health, productivity, economic growth and employment.

Security and reliability

Demand response can provide both emergency capacity and FCAS, both of which are critical for reliability. Energy markets require a mixture of supply- and demand-side services for reliability, and demand response has a number of features that make it an essential part of this mix:

- **Availability:** many forms of demand response are almost permanently 'ready' and highly reliable. In contrast, significant investment is required to keep generators ready, even if they are called on for just a few hours a year, and generators need to already be spinning to provide FCAS. It is notable that some gas-fired generators in South Australia were not able to provide capacity on 8 February.
- **Speed:** Many forms of demand response can be delivered rapidly (less than one second), in contrast to longer ramp times for generation services.
- **Affordability:** as demand-response services are effectively an adjustment of equipment that has another purpose, it is typically much cheaper to deploy than building and maintaining generation that is only used for a few hours a year.

Affordability

Energy efficiency reduces households' and businesses' energy bills by reducing both the quantity of energy that they use and their peak demand. For example, while California has a relatively high price per unit of electricity, the state's low *per capita* consumption of energy means that their average household energy bill is amongst the lowest in the US.

Demand response also has a critical role in lowering the cost of the electricity system by providing low-cost FCAS and capacity. This reduces wholesale costs by both avoiding the construction and deployment of higher cost peaking generators, but also by increasing competition during periods of tight demand-supply balance. While there are multiple causes for recent increases in wholesale energy prices in Queensland and South Australia, reduced competition likely had a significant role.

In addition, demand response can also lower network costs by reducing the expenditure required on the grid to meet critical peak demand, which often only lasts for a few hours a year. The failure to facilitate demand-response in the NEM has significantly increased the cost of meeting demand. For example, in 2010 roughly 25 per cent of retail electricity costs in NSW were derived from peak events that occur for less than 40 hours per year[2].

In addition, demand-side investments typically have a much shorter payback period, which reduces the risk of stranded assets. Meeting our current energy needs with demand-side investments will therefore reduce the risk of wasted expenditure during this period of transition and uncertainty.

[2] Australian Government 2012 *Energy White Paper 2012*, originally from a paper delivered by Ross Fraser *'Demand side management'* at the Australian Institute of Energy symposium 24 May 2010, Sydney.

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Emissions reduction

Energy efficiency can rapidly and affordably deliver around half the abatement potential in the NEM (Figure 1). For example, appliance standards are expected to deliver abatement at around minus $118 per tonne of avoided emissions.

While demand response delivers more modest amounts of direct abatement, it is critical to facilitate the shift to low-emission forms of generation, such as wind and solar PV.

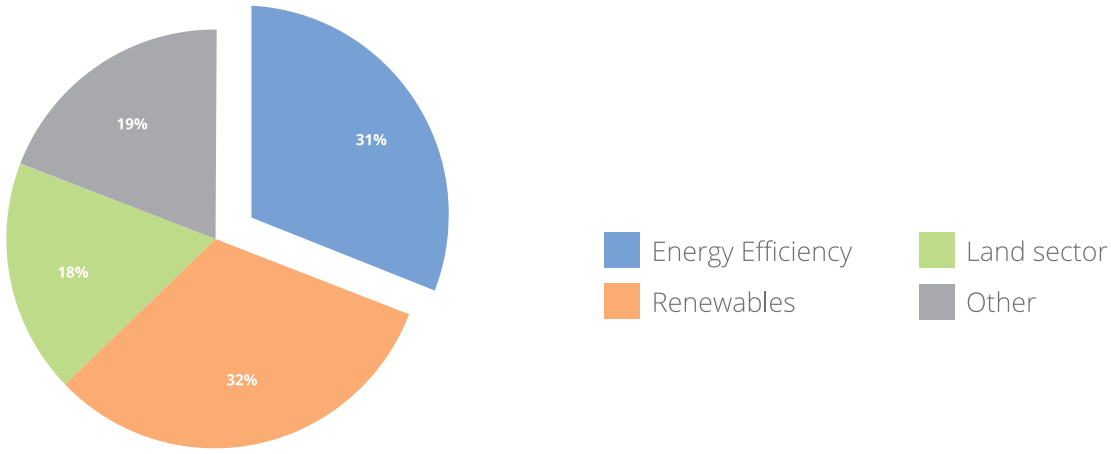

Figure 1. Abatement potential in Australia to 2030
Source: ClimateWorks Australia and WWF 2015, *A prosperous, net zero pollution Australia starts today*

Other benefits of energy efficiency and demand response

- **Productivity and economic growth:** Improving energy efficiency by just one per cent a year has been estimated to expand Australia's economy by $26 billion by 2030[3]. Smart energy use drives economic growth by improving staff productivity and resource efficiency while lowering energy costs. For example, improving the efficiency of offices delivers an increase in staff productivity that is worth much more than the energy savings.
- **Jobs, investment and innovation:** The global market for smart energy products and services is worth more than $290 billion per annum and is growing rapidly.[4] If Australia captured just one per cent of the global market it would deliver $2.9 billion in income every year and create thousands of jobs. California now has more than 321,000 people employed in energy efficiency, with employment growing six per cent per annum in recent years.[5]
- **Consumer protection and health:** Minimum standards and ratings for homes and appliances protect consumers and ensure that they get what they pay for. When builders and manufacturers cut corners it can increase households' energy bills, reduce comfort and even affect their health. Building efficiency impacts winter mortality rates, which are a significant cause of death - more than 26,000 deaths each year in Australia are associated with cold weather.[6, 7]

[3] Climate Institute 2013, *Boosting Australia's Energy Productivity*.
[4] International Energy Agency 2016, *Energy Efficiency Market Report 2016*.
[5] Advanced Energy Economy Institute 2016, *Advanced Energy Jobs in California*.
[6] International Energy Agency 2014, *Capturing the Multiple Benefits of Energy Efficiency*.

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3. The NEM urgently needs more demand-side activity

Australia's level of energy efficiency, demand response and cogeneration are well below optimal levels, and this has a negative impact on energy affordability, security and prices.

Energy efficiency

Australia's energy productivity[8] (a measure of energy efficiency) was 14 per cent below the OECD average in 2012.[9] Australia's energy productivity has also been improving at a much slower rate that many of our competitors, increasing by just 1.48 per cent in 2014-15. This rate of improvement is lower than the average of 1.69 per cent over the preceding 15 years, and well below the 2.26 per cent required to meet the Australian Government's target to increase energy productivity by 40 per cent by 2030.[10]

The decreased rate of energy productivity improvement is particularly concerning since it has occurred during a period of rapid increase in electricity and gas prices. This supports the finding from many studies that there are major barriers to energy efficiency in Australia, and this materially affects households' welfare and businesses' competitiveness.

Demand response

The level of demand-response occurring in the NEM is much lower than both the potential in Australia and the level occurring in other key economies.

Capacity: In a healthy market, demand response can regularly deliver at least 10 per cent of capacity. In the NEM, demand-response probably only delivers a few per cent of capacity.[11] However, the potential for demand response in Australia is significant, with industrial users alone estimated to be able to offer at least 3.1 Gigawatts (GW) of demand response. This is equivalent to 42 per cent of the 7.6 GW these users draw during summer system peaks.[12]

FCAS: Demand response provides around 75 per cent of FCAS in New Zealand, but under 2 per cent in the NEM. This indicates substantial potential to secure more FCAS from demand-response in the NEM.

Recent load shedding in South Australia, supply constraints in NSW and price spikes in Queensland could have been significantly mitigated with demand response.

Cogeneration

Australia's level of cogeneration is well below the equivalent in other major developed economies. While Australia's temperate climate does affect the economics of cogeneration, the major factor constraining deployment has been the lack of a supportive regulatory culture and the recent rapid jump in gas prices.

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[7] Gasparrini A. et al 2015 *'Mortality risk attributable to high and low ambient temperature: a multicountry observational study', The Lancet, Vol 386, No. 1991, p367-375.*

[8] GDP per unit of primary energy.

[9] Australian Alliance to Save Energy 2014, *2XEP – Australia's Energy Productivity Opportunity Framing Paper*.

[10] COAG Energy Council 2016*, National Energy Productivity Plan Annual Report 2016.*

[11] It is difficult to precisely determine the quantum of demand-response in Australia as much of its occurs through private contracts between retailers and large energy users.

[12] ClimateWorks 2014, *Industrial Demand Side Response Potential.*

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Future markets

As highlighted above, the levels of energy efficiency, demand response and cogeneration in the NEM are well below optimum levels for our current energy system. However, demand-side activities will be even more critical in coming years.

- **Intermittent generation:** demand response can significantly reduce the cost of ensuring security of supply despite an increase in intermittent renewable generation, by providing both fast-response capacity and FCAS at much lower prices than either gas-fired generation or storage. A portfolio that includes gas-fired generation, storage and demand-response will be required to meet the NEM's need for capacity and FCAS. Excluding the lowest-cost form of capacity (demand response) from this portfolio will significantly raise costs.
- **Flexibility and uncertainty:** The significant uncertainty around technology development pathways and consumer preferences (e.g. disconnection from the grid) creates a risk of stranded assets. This means that investors are wary of system investments with long payback periods (e.g. network infrastructure). While some network service providers have argued for accelerated depreciation to ensure their returns, this simply transfers the risk of stranded assets to energy users. Demand-side activities typically have a much faster payback period and can significantly delay the need for expenditure, which creates flexibility and enables us to meet our current energy needs without locking in infrastructure that could potentially be stranded.
- **Efficient investment:** Australia needs to make significant investments in supply in the coming decades. Failing to properly balance demand side and supply side investment during this period could result in expensive overinvestment.

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.

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4. Demand-side issues are an integral part of energy reforms

The Energy Efficiency Council strongly argues that any review of the NEM must consider demand-side issues. Supply and demand and are not separate stories - they are two halves of the same story. Improving the way that we use energy is essential to ensure that the shift to new forms of generation is fast and affordable.

The cheapest way to meet Australia's energy needs is to balance investment in energy supply with smarter energy use. The balance of investment is affected by overlapping markets for energy, products (such as fridges), and services (such as building design).

Australia's electricity systems are not natural markets. Networks are run by regional monopolies (NSPs) and, while there is some competition in electricity generation and retail, those markets are also highly regulated to protect both consumers and grid stability. This means that the question is not whether governments regulate energy markets, but how they regulate them.

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

- Electricity networks have significant incentives to invest in grid augmentation, but weak incentives for demand-management. The role of networks is to link generators to energy users, and aggregate multiple generators and consumers to boost reliability and reduce costs (e.g. combining multiple demand profiles creates a more stable load profile). Theoretically, networks should invest in a combination of supply-side and demand-side investments that deliver connection services at lowest cost, but in practice they have largely focussed on supply-side investment.
- The lack of a clear, simple and stable market for demand-response and FCAS undermines the potential for voluntary changes in demand to provide grid services. In many energy markets demand-response provides around 10 per cent of capacity.
- 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.[13] 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[14], 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."*

[13] Australian Government 2012, *Energy White Paper 2012.*
[14] COAG Energy Market Review 2002, *Towards a Truly National and Efficient Energy Market.*

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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 economically efficient levels of 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 to renewables, storage and energy management occurs in a way that is cost effective, fair and benefits consumers. This will require fundamental changes to the way the electricity sector operates.

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5. Key recommendations

A full discussion of energy market reform is outside the scope of both this submission and the Review. Instead, the Energy Efficiency Council strongly recommends that the Review make four high-level 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 Review must explicitly emphasise that energy management is essential to the security, affordability and sustainability of the NEM.

2. **COAG Energy Council establish an urgent *'Demand Response Review'***

   The most urgent issue for both security and affordability in the NEM is the deployment of transparent demand-response for emergency capacity, FCAS and affordable peak demand. If there had been an effective market for these services in February 2017 broad-scale load-shedding in South Australia and targeted load-shedding in NSW could have been avoided, and prices across the NEM moderated.

   The *Demand Response Review* should aim to identify and design a range of national and state-based options to unlock the potential of demand response, and make a recommendation on a preferred option for rapid implementation. The Review should be supported by a roundtable including representatives of energy consumers (e.g. Energy Consumers Australia, Energy Users Association of Australia and Australian Industry Group), energy management experts and the broader energy sector.

   No single energy market body has both the skills and the terms of reference to provide a holistic assessment of these issues. Therefore, it is critical that this review is carried out by an independent secretariat that reports to the COAG Energy Council, rather than the Australian Energy Market Commission (AEMC).

3. **COAG Energy Council establish a separate *'Energy Productivity Taskgroup'***

   There is a broad range of energy management issues that are important but less urgent than those that a Demand Response Review needs to consider, including electricity tariff structures, demand-management to lower network costs and cogeneration. These measures sit under the National Energy Productivity Plan (NEPP) but require ongoing funding and attention from the COAG Energy Council to realise. As with the *Demand Response Review*, this Taskgroup should be supported by a roundtable of consumers and energy experts.

4. **Governance reform**

   The NEM's governance structures are not designed to facilitate the rapid reforms that are necessary to respond effectively to ongoing transformation in energy technologies and markets. The Review should recommend substantial governance reform, including increasing key institutions' demand-side capability and focus and establishing a *National Energy Efficiency and Productivity Agency.*

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5. Key areas for NEM reform

While the Energy Efficiency Council recommends that the Review make four high level recommendations, we also recommend that the Review's final report discuss a number of priority areas for NEM reform.

Effective incentives for demand response

The most cost effective way to provide capacity and FCAS in energy markets is to pay for a mix of generation capacity, storage and demand response. To facilitate this, governments need to introduce mechanisms that provide clear, transparent and stable payments for demand-response. While retailers are able to directly contract with energy users around demand-response, in practice this *ad hoc* approach has not unlocked the full potential for demand-response and the amount of available demand response is not transparent to the system operator (the Australian Energy Market Operator (AEMO)

The AEMC recently decided to not proceed with a specific demand response mechanism that was largely designed to address wholesale costs (rather than emergency capacity) based on both disputed modeling and tenuous statements. However, the AEMC declined to propose an alternative mechanism to unlock demand-side potential in the NEM despite the clear and pressing need. Following recent events in South Australia and NSW it is clear that demand-response is essential to provide reliable and affordable electricity. As such, the Council recommends that an independent Review be established to look across the full range of issues for demand response.

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 Network Service Providers (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 must be a genuine incentive to reduce demand (e.g. encouraging demand-side works when they can reduce the cost of replacing ageing assets).

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

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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 with consumers**.**

Energy retailer obligations

Energy retailer obligations are often referred to as *'energy efficiency certificate schemes'* and '*energy efficiency schemes'*.

Australia has established wholesale markets and electricity networks that allow aggregation of supply side investment, but not demand side investment. To partially correct this, governments in NSW, Victoria, South Australia and the ACT have introduced obligations for retailers to fund energy efficiency activities. These create small markets for aggregated energy services. Government specify how much energy various actions will save (e.g. replacing halogen down lights with LEDs) and retailers need to show each year that they have funded a combination of actions that meet their target.

The assessments of these programs show that the benefits of these schemes substantially outweigh their costs. However, there is substantial opportunity to deliver even greater benefits through these schemes by extending them to Queensland, Western Australia, Tasmania and the Northern Territory, harmonizing them and modifying them to ensure that they support large energy users.

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6. Key issues outside the NEM

The Energy Efficiency Council recommends that the Review discuss a number of key issues for energy productivity that lie outside the rules and regulations of the NEM.

As noted before, the balance of investment in energy supply with smarter energy use is affected by overlapping markets for energy, products (such as fridges), and services (such as building design). The distortions in the NEM interact with distortions in other markets. For example:

- When consumers can't compare the efficiency of buildings and appliances they can't select more efficient options, reducing the incentive to supply better goods. This is known as 'Adverse Selection'.
- Landlords own buildings, but tenants pay electricity bills. This can make it very challenging to upgrade the efficiency of rented homes and offices; and
- Most households and businesses lack the key skills they need to build a business case around energy efficiency, find trusted experts and improve their efficiency.

The Energy Efficiency Council recommends a wide range of actions to address these barriers. Addressing these barriers will improve the affordability, reliability and emissions profile of Australia's electricity sector by improving the balance of investment in supply-side and demand-side activities. Actions to address these barriers include:

- Establish programs to upgrade government facilities in all jurisdictions like the NSW Government Resource Efficiency Policy.
- Transform offices by investing at least $10 million a year over ten years through the COAG Energy Council to engage building owners, provide incentives for building upgrades and develop minimum standards for rented offices.
- Develop a national residential energy efficiency disclosure scheme; and
- Minimum standards for buildings and appliances.

The Council's full list of recommendations can be found in the *Australian Energy Efficiency Policy Handbook*, which can be accessed at: www.eec.org.au/policy-advocacy/handbook. The Council recommends the Review discuss:

Setting up an Energy Productivity Taskgroup and funding the NEPP

In order to drive NEPP measures, the Energy Efficiency Council recommends that the Australian Government and State and Territory governments set up a high-profile Energy Productivity Taskgroup with a stakeholder panel and substantially increase funding for the COAG Energy Council's National Energy Productivity Plan (NEPP). NEPP programs could potentially be funded by a small surcharge on energy bills, as the benefits of these programs in reducing energy bills would vastly outweigh the size of the surcharge.

California has achieved significant improvements in energy efficiency and deployed extensive demand response though both utility regulation and energy management fund that sits alongside their energy market. https://energy.gov/eere/femp/energy-incentive-programs-california

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7. Key governance issues

There have been numerous independent reviews of the NEM over the past 20 years that have concluded that urgent action is required to increase demand-side participation. However, few substantial changes have been made to address demand-side barriers, largely due to the governance arrangements in the NEM.

A good example of this is the debacle over the Demand Response Mechanism (DRM). In mid 2012 the AEMC proposed a specific design for a DRM. In late 2012 COAG indicated support for the DRM and in early 2013 the COAG Energy Council directed AEMO to design the DRM in detail. However, following last-minute lobbying by some organisations, in December 2013 the COAG Energy Council decided to defer submitting the DRM Rule Change proposal pending a cost-benefits analysis. As a Rule Change review should include a cost-benefit analysis, theoretically this additional cost-benefit analysis was unnecessary.

After the cost-benefit analysis concluded that a DRM would deliver net benefits, the COAG Energy Council asked the AEMC to consider the DRM Rule Change proposal. In late 2016 the AEMC determined not to proceed with the DRM based on grounds that the Council strongly disputes, and declined to put forward an alternative DRM design to unlock demand response.

In other words, it took more than four years from the AEMC proposing a fairly straight-forward Rule Change to the AEMC rejecting the proposal. This highlights that NEM's governance system is not designed to facilitate rapid reforms, particularly because major changes require the support of multiple governments and proposed reforms often bounce between multiple organisations before they are implemented. These structural issues are exacerbated by the AEMC's lack of capacity around demand-side issues, and a supply-side bias amongst some policy makers. The view of some individuals, that market bodies have no responsibility for demand-side issues, demonstrates a profound lack of understanding about how energy markets function.

These problems partly stem from some organisations taking a narrow misreading of the National Electricity Objective (NEO). The NEO is:

> *"to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to – price, quality, safety, reliability, and security of supply of electricity; and the reliability, safety and security of the national electricity system."*

An appropriate understanding of the NEO would include demand-side activities in the term 'electricity services', but in practice some policy makers have taken 'services' to simply mean 'supply-side services'. As a result, the AEMC and others have largely ignored the demand-side and, while the AEMC regularly considers the viability of electricity suppliers during its deliberations, it pays virtually no attention to the viability of demand-side providers.

While the NEO is broadly appropriate, the focus on 'price' is not. Ultimately, consumers are concerned about the size of their energy bill, which is affected by fixed charges, variable charges, energy consumption and peak demand. As noted earlier, California has amongst the highest prices for electricity in the US, but the lowest bills, largely due to higher levels of energy efficiency. By focusing on 'price' the NEO doesn't take demand-side matters fully into account, which leads to sub-optimal outcomes. Even just

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considering supply-side issues, the complexity of how 'prices' are set (including fixed and variable components) means the term 'price' is deeply problematic.

Wholesale governance reform is likely to be necessary (including changing the NEO to focus on the 'cost to consumers' rather than 'price'), but at a minimum the Council recommends that the Review discuss:

Establishing a *National Energy Efficiency and Productivity Agency*

A new agency should be established to administer national programs for the COAG Energy Council, such as appliance standards and the NEPP.

Increasing key institutions' demand-side capability and focus

The AEMC, Australian Energy Regulator (AER) and AEMO must have the capacity and directions to give appropriate regard to energy productivity. As a priority, both the AEMC and AER and should have one part-time Commissioner appointed with a specific focus on demand-side issues, and the COAG Energy Council should direct the AEMC, AER and AEMO to have regard to the national target to improve energy productivity by 40 per cent by 2030.

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