Mr John Pierce
Chairman, Australian Energy Market Commission
PO Box A2449
SYDNEY SOUTH NSW 1235

4 May 2012

Re: Project Number EPR 0022- Stage 3 Demand Side Participation Review Directions Paper

Dear Mr Pierce

The Australian Energy Market Commission (AEMC) has sought comment on the Directions Paper for the "Power of choice - giving consumers options in the way they use electricity." This submission provides the Energy Efficiency Council's response to the Issues Paper.

The Energy Efficiency Council is the peak body for energy efficiency, demand response and cogeneration, and brings together Australia's top expertise in demand-side to support the development of policy and programs. Incorporating expert advice into the design of demand-side programs significantly improves their effectiveness.

The Energy Efficiency Council believes that addressing barriers that impede improvements in energy efficiency and distort peak electricy demand are the most critical and pressing priorities for the AEMC. The Council welcomes the AEMC's Direction Paper recognising that these barriers exist and distort decision in the National Electricity Market (NEM).

The Council has developed a number of recommendations relevant to the NEM rules, regulations and operations. These recommendations would maintain investor confidence and can be introduced without significant cost or disruption. However, these recommendations would substantially improve the economic efficiency of the market.

As stated in the National Electricity Objective (NEO), the focus of NEM operations should be the long-term interests of consumers. Therefore, the Council has developed recommendations that will:

- Reduce energy costs for consumers in the long and short-term, by reducing the need for expenditure on infrastructure with a low utilisation rate.
- Improve the economic efficiency of the market, by addressing a number of issues such as distorted price signals that do not reflect the cost of supply at specific times and locations.
- Increase competition and place downward pressure on costs in the energy-only market, particularly during periods of peak demand, which would translate into lower prices.

Peak demand management is one of the most critical issues for the energy market at present. Peak demand has grown by 30 percent between 1999 and 2010, from 26 GW to 34 GW. Recent work, which is included in the Australian Government's Energy White Paper, suggests that around 10 to 25 percent of total energy bills are currently due to peaks that last just 0.5 per cent of the year. In other words, assets that are used for less than 40 hours a year account for a significant proportion of energy costs.

Unless peak demand is tackled urgently, low asset utilisation rates will become a far more serious problem than it already is. While energy consumption has declined in recent years, peak demand is still growing rapidly. The Energy White Paper projects that $240 billion of investment in infrastructure will be needed by 2030, and much of this is required to meet peak demand. The Energy White Paper notes major challenges to delivering this scale of investment and, as the cost of this infrastructure will need to be divided between fewer units of energy consumed, this scale of investment would see the cost per unit of energy increase substantially.

The reasons for this rapid growth in peak are well understood. Australia does not have a more serious peak demand problem than other high-income countries because of weather patterns or declining costs of air-conditioning units. It has a serious peak demand problem because the economic framework for cost-effectively reducing peak demand is under-developed. Currently, the vast majority of consumers pay only a fraction of supply during critical peaks and, unsurprisingly, this has lead to overconsumption during critical peak periods.

Conversely, establishing an effective market system would reduce overconsumption during critical peaks and unlock the potential for energy efficiency, demand-response and distributed generation to reduce expenditure on network and generation infrastructure.

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While time-of-use pricing offers one route to unlock demand-response, it will be challenging to introduce widespread time-of-use pricing in the next one or two decades due to practical issues and public concerns. Furthermore, even with time-of-use pricing, there will still be significant information and bounded rationality problems that prevent consumers from acting on their own to optimise their energy demand patterns.

However, providing consumers with separately contestable services for energy supply and provision of demand-response into the wholesale energy market would enable consumers to be rewarded for reducing their demand during critical peaks, without requiring them to dispense of the valuable risk management services that they currently receive from energy retailers. Creating a new class of market intermediary to assist consumers to optimise their energy demand patterns would require the development of rules for intermediaries to provide consumer protection.

The Council believes that if this market was established it would also enable meaningful volumes of Demand-Side Participation (DSP) to be developed by, and sold to, Network Service Providers (NSPs). This would help reduce expenditure on transmission and distribution infrastructure and partially address the split incentive, whereby the benefits of DSP are split between several parties.

However, fully realising the benefit of DSP to reduce investment in network infrastructure will require reforms to the way that NSPs are regulated and incentivised, to ensure that they are motivated to undertake and procure DSP. In particular, the Council recommends decoupling NSP revenue from energy throughput and establishing an ombudsman in the Australian Energy Regulator (AER) to ensure that NSPs abide by any relevant rules for connecting distributed generation to the network.

Finally, while the Council supports energy efficiency certificate schemes, the Council recommends that the AEMC leave the work on these schemes to the Australian Government's Energy Saving Initiative Secretariat.

In summary, the Energy Efficiency Council recommends a number of modest changes that could be introduced rapidly to unlock the power of DSP, including:

- Give consumers the choice to sell their demand-response into the market
- Set rules appropriate rules for demand-response providers to protect consumers
- Ensure that NSPs have the right incentives, skills and requirements to invest in DSP
- Establish a distributed generation ombudsman in the AER. The ombudsman would ensure adherence with a standard connection process for distributed generation and enforce rules about who pays the costs of any upgrades to the grid.

Australians deserve energy markets that serve their interests. The Energy Efficiency Council looks forward to working with the AEMC to ensure that the NEM meets the needs of the community. Please contact me on 03 8327 8422 should you require further information on any of the issues raised in this submission.

Yours sincerely

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1. Key Policy Recommendations

The Energy Efficiency Council recommends a number of specific but modest changes to improve the operation of the NEM.

1 Give consumers the choice to sell their demand-response into the market

1.1 'Unbundle' energy retail and demand-response[1] by:

- o Adjusting the National Metering Identifier Procedure (NMI) to allow a single site, and a single meter, to be split into two entities – an electricity consumer and a demand-response provider.
- o Create a new category of energy market participant, called a 'demand-response provider', and allow responsibility for that participant to be allocated to a designated party, whether that is the energy user, a retailer, an aggregator or another party.

1.2 Establish protocols for the combination of metering and inference required to determine how much demand-response has been supplied by a 'demand-response provider'.

1.3 Enable demand-response to be sold into a market. This paper examines a mechanism to sell demand-response to be sold into the energy-only wholesale market. Alternatively, demand-response could be sold into a capacity market.

1.4 Support 'demand-response providers' to also sell demand-response to NSPs to enable them to avoid investment in network infrastructure. This transaction may need to be overseen by the Australian Energy Regulator (AER) given that NSPs have monopoly power in setting prices for demand-response in this type of transaction.

2. Set appropriate rules for demand-response providers to protect consumers

3. Ensure that NSPs have the right incentives, skills and requirements to invest in DSP

3.1 Engage with NSPs and ensure that NSPs have appropriate incentives to invest in DSP. This will require, at a minimum decoupling NSP revenue from energy throughput and giving NSPs the capacity to earn at least an equivalent return on expenditure from DSP as they can earn on network infrastructure.

3.2 Place an obligation on network companies to invest in a minimum level of DSP in order to build their capacity and address internal supply-side biases. A number of options should be considered, including a mandatory requirement for network companies to purchase a certain quantity of DSP through a target to either:

- o Offset at least 50 per cent of expenditure on peak-demand-growth-driven network augmentation using DSP; or
- o Directly invest or purchase DSP each year equivalent to 10 per cent of their capex expenditure.

3.3 Require NSPs to offer DSP opportunities on an open market. The NSP should be allowed to bid for the DSP opportunity if it chooses, but the bidder with the best offer (considering both quality and cost) should be selected. The EEC notes that the AER will need to have oversight of this process given that this will create provider / tenderer conflicts.

3.4 Require network companies to publish an annual statement of opportunities for DSP

3.5 Increase the AER's powers to regulate network companies. In particular, if a network company seeks to have a decision by the AER reviewed, the entire AER determination should be re-assessed, to avoid 'cherry-picking' of AER determinations.

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[1] NB – Whilst the Energy Efficiency Council supports separation of retail and demand-side services into sepearate contestible markets, it should be noted that not all members hold this position.

4. Regulate time-frames and costs for energy consumers and third parties (with consumers' permission) to access data on energy consumers' demand patterns.

5. Tackle the barriers to cogeneration

5.1 Establish a distributed generation ombudsman in the Australian Energy Regulator. The ombudsman would ensure adherence with a standard connection process for distributed generation and enforce rules about who pays the costs of any upgrades to the grid.

5.2 Require annual maps of the costs and benefits of connecting cogeneration at different points on the grid, including potential payments for offsetting infrastructure investment. The pre-emptive analysis of the costs and benefits of connecting to the grid at different points would provide greater information transparency, opening up competition in the market.

5.3 Establish a standard national grid connection protocol in line with the procedure recommended in the ClimateWorks 2011 report *'Unlocking the barriers to cogeneration: Project Outcomes Report'*.

5.4 Amend key rules to allow cogeneration owners and operators to sell electricity directly to energy users and set up a simple, transparent system that gives cogeneration owners and operators the option to sell electricity at sites as 'light red-tape' regulated monopolies.

5.5 Develop virtual private wire rules to allow cogeneration owners and operators to use the public electricity network to supply electricity to local sites (e.g. multiple council buildings) and pay network charges that reflect the cost of using the network for very short distances.

5.6 Invest in the backbone gas supply network and establish clear rules about who pays for minor expansions of the gas network.

5.7 Undertake a national study into competition and accessibility in gas supply.

5.8 Set up a network support payment scheme for the first 3,000 MW of cogeneration in Australia. While ideally network support payments should be paid on a location by location basis, establishing a firm system to determine these payments could take many years. In the meantime, a simple scheme that provided minimum payments would address multiple barriers to cogeneration providers, including first-mover disadvantage in a complex market. The incentive should only be provided to cogeneration that:

- Exceeds a minimum threshold of efficiency (e.g. 50 per cent), with additional incentives for cogeneration units as their efficiency increases beyond this threshold.
- Is below 30 MW and runs for more than a certain number of hours per year.

6. The Energy Efficiency Council strongly supports a national Energy Saving Initiative (ESI). The AEMC should note the important role of energy efficiency certificate schemes, but leave the work on these schemes, including the case for their introduction, to the Australian Government's Energy Saving Initiative Secretariat, which is carrying out significant work in this area and will ultimately report to the Council of Australian Governments.

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2. Current barriers to demand-side activities

There are a number of barriers that currently distort the demand of energy. These distortions can occur in one or more of the following dimensions:

- **Total consumption** – some barriers result in consumers using more energy in total (e.g. over a year) than would be privately and socially optimal. For example, information and bounded rationality barriers result in many consumers installing lighting systems that do not meet their requirements and have high running costs.

- **Time-of-use** – some barriers result in consumers using more energy at specific periods (e.g. during critical peaks) than is privately optimal. Demand during critical peaks has major impacts on total energy cost.

- **Location** – some barriers result in individuals in specific locations consuming more than is socially cost-effective. Demand at specific locations (e.g. in areas that are grid constrained) has significant implications for total energy cost.

All barriers to optimal energy demand patterns use need to be tackled, but reforms to address time-of-use barriers are particularly urgent to keep electricity affordable. If the barriers to efficient peak demand are not addressed in the near future, it will result in billions of dollars will be spent on generation, transmission and distribution infrastructure with low utilisation rates. Much of this expenditure could be avoided.

Imperfect pricing

The Energy Efficiency Council welcomes the statements from the AEMC recognising that the vast majority of consumers do not receive cost-reflective pricing. There are several types of pricing distortion, including cross-subsidies for specific classes of consumer, but time-of-use and locational distortions appear to be the most significant impact on energy prices. It is an incontrovertible fact that most, if not all, energy consumers face electricity prices that do not accurately represent the cost of supply at the specific time and location of use.

Imperfect pricing – time-of-use

The cost of energy supply varies significantly with time. Wholesale energy costs during critical peaks, which often total less than 40 hours a year, can be over 300 times average wholesale cost. The marginal cost for networks during critical peaks can be even more substantial. Combined, this means that a cost-reflective total energy price during critical peaks could easily exceed $30 per kWh[2]. However, at the moment most energy consumers face a maximum 'peak' charge of around 20-30 cents per kW, in other words less than 1 per cent of supply costs during critical peak periods.

There are a number of reasons that most consumers do not face anything like a time-of-use tariff – in fact, most consumers are almost completely insulated from temporal variations in the real cost of energy supply. Firstly, the majority of consumers do not have smart meters. Secondly, even if users have smart meters, the majority do not face a genuine time-of-use tariff.

Currently, only a handful of energy users are exposed to the wholesale energy price. The NEM has been specifically structured to insulate consumers from the complexity of wholesale energy prices. Transaction costs and bounded rationality means that consumers would be unable to respond to the complex variation in energy prices. Part of the role of retailers is to provide hedging services and simplify this complexity so that consumers can be offered simple, clear energy price structures.

Even in cases where retailers charge households and businesses different rates during daily peak and off-peak times, these are not genuinely cost-reflective. These tariffs typically vary on a daily basis (i.e. a daily 'peak' and 'off-peak' tariff) when in fact the real difference in wholesale energy cost is between 'most of the year' and 'critical peaks'. Secondly, even large consumers are not always charged in a way which reflects the extreme variations in network costs. Even tariffs which charge consumer for network costs based on individual maximum demand do not take into account whether the maximum demand is coincident with the regional or system-wide peak.

[2] This estimate consists of $12.50/ kWh for the wholesale electricity price, at the market price cap, and the remainder by the marginal cost of transmission and/or distribution network supply when the marginal increase demand leads to the need to initiate an augmentation project.

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Given the fact that many energy consumers could be charged less than 1 per cent of the cost of supply during critical peaks, it is unsurprising that peak demand is growing faster than would be socially optimal. The Council's recommendations to address time-of-use pricing distortions are set out in Sections 3, 4 and 5. In summary, while critical peak pricing is one strategy that could address time-of-use issues, it may not be the most effective and, more critically, public acceptance and practical issues means that it is virtually impossible to deliver widespread critical peak pricing in the next decade.

Imperfect pricing - location

The cost of energy supply also varies substantially with location. The cost of providing network infrastructure varies between locations, and network losses vary between locations. This is not simply a case of urban supply versus rural, regional and remote supply – the costs can vary on a suburb by suburb basis. In particular, the marginal cost of supply during periods of critical peak demand varies dramatically between locations, as one suburb could have substantial excess capacity, while another location may require network augmentation to accommodate any further increases in demand. However, the NEM rules require 'postage-stamp' pricing, so that energy prices are heavily smeared between regions.

Without significant technological and corresponding regulatory intervention, it would unreasonable to expect that widespread nodal pricing will be implemented within the next two decades. As a result, energy prices will continue to fail to reflect the cost of use at specific locations, which means that NSPs have a critical and obligatory role to correct locational pricing distortions.

Split incentives

The AEMC's Direction Paper clearly identifies that the benefits of energy efficiency, particularly demand response, are split between multiple parties. For example, a single demand-response action could:

- Reduce energy user consumption; and
- Defer network company spending on network augmentation; and
- Reducing hedging costs for an energy retailer.

The lack of cost-reflective pricing means that no party is appropriately incentivised to undertake these actions. However, if demand-response could be commoditised (see sections 3, 4 and 5 of this submission), it could help align interests between multiple parties. However, free-rider problems could still persist, with some parties, particularly NSPs, benefitting from a demand-response action but not contributing towards its cost.

Information failures and bounded rationality

Even if prices were perfectly cost-reflective, gaps in information, skills and high transaction costs can make it non-economic for individual consumers, including most large consumers, to optimise their pattern of energy consumption without support. In well-functioning markets, market intermediaries can reduce the impact of information barriers by using economies of scale to develop skills, gather information and perform functions on behalf of multiple consumers.

The structure of the NEM already implicitly accepts that information barriers exist and that market intermediaries have a critical role to address these information barriers. On their own, most energy consumers would find it extremely difficult to secure an affordable and low-risk energy supply by purchasing energy directly from the wholesale market. Retailers have a critical role in securing energy supplies and hedging energy costs on behalf of consumers.

Similarly, for the vast majority of energy consumers, access to third parties is critical to optimising their energy demand. In particular, the costs of in-house monitoring of energy prices and responding to periods of peak demand would outweigh the benefits for most energy consumers. However, with the right market structure a third party with the right information technology and remote load control technology would be incentivised to:

- Identify demand-side opportunities at numerous sites, such as switching off chiller units for short periods.
- Sign contracts with energy consumers that assign the control of these loads under specified conditions to the third party in exchange for a fee and / or a share of the benefits from selling these demand-side services

- Monitor energy prices, energy loads and prices for network services
- In real-time, identify spatially and temporally specific opportunities to reduce energy consumers costs or sell peak reduction services to the network
- Use economies of scale to combine actions by multiple consumers to deliver large, firm and predictable reductions in energy demand.

Unfortunately, the NEM structure currently impedes consumers engaging third parties to optimise demand, as consumers cannot easily commoditise the value of demand-response separately from their overall energy contract. If consumers could commoditise the value of demand-response this would create a revenue stream that third parties could use to cover costs and reward the energy consumer.

Barriers to third parties

The NEM does not currently provide a market structure that assists third parties to provide optimal levels of demand-side services. Although some electricity retailers provide both electricity retail services and demand-side services, demand-side services are fundamentally different in their nature to retail services. However, at the moment there are a range of factors that make it harder for most energy consumers to engage third parties to provide these services separately.

The market effectively expects consumers to buy two non-commensurable services (energy retail and demand-side services) in one package. This significantly reduces the competition between service providers, compared to a situation where consumers could select the best retail offer and separately select the best demand-side service. It is clear that, where consumers are required to choose between two bundles containing non-commensurable services (e.g. provider A offers a good retail offer but a poor demand-side offer, and provider B offers a poor retail offer but a good demand-side offer), they will find it harder to make an optimal decision compared to a situation where they can separately compare retail offers and demand-side offers (noting that an electricity retailer could provide both energy retail and demand-side offers).

Furthermore, while demand-side services effectively require a minimum contract of 3 to 5 years, ideally consumers should be able to switch retailers as soon as a better offer comes on to the market. Forcing these services to be bundled together reduces the attractiveness of demand-side services, as it locks energy consumers into long-term retail contracts if they take up demand-side services.

Principal-Agent Problems in the NEM

While energy users make a number of decisions that impact on the energy market, many decisions are made by their ‘agents’ in the NEM. For example, even if perfectly informed consumers received completely cost-reflective price signals, they would still rely on electricity NSPs to respond to their energy use decisions in the way that they invest in infrastructure. Theoretically, NSPs should respond to consumer decisions in ways that maximise benefits for consumers. It appears that this is not occurring.

NSPs should consider both peak demand and consumption when determining the cost benefits of DSP versus network augmentation. For example, when utilisation rates for infrastructure are very low, demand reduction is generally much more cost-effective than supply-side options. However, many NSPs are still building infrastructure based on the assumption that energy consumption is rising, when in fact it has been declining for the last few years.

Furthermore, NSPs do not have the skills or incentives to determine when DSP would be a suitable option and deliver DSP programs. In combination with the issues discussed above, this is likely to result in overinvestment in network infrastructure, which increases electricity costs. The potential for infrastructure decisions to affect electricity costs is clear - Professor Ross Garnaut estimates that 68 per cent of recent rises in electricity prices have come from investment in electricity transmission and distribution infrastructure[3].

However, energy consumers do not have the ability to switch to another NSP if they feel that their NSP is making poor investment decisions on their behalf. NSPs are monopolies and consumers are in a weak position to influence NSPs’ behaviour. The result for energy consumers is that, even though they are responding somewhat to energy price changes, distributors’ investment decisions

[3] Garnaut, R. (2011) *The Garnaut Review 2011: Australia in the Global Response to Climate Change*, Commonwealth of Australia, Canberra.

are not reflecting their choices. In other words, there are principal-agent problems between consumers and distributors.

The role of NSPs is even more critical if we consider that consumers are not receiving cost-reflective price signals and are not able to perfectly respond to price signals. For example, the lack of nodal pricing means that consumers in a suburb with a constrained network do not receive the price signals that would encourage them to reduce their demand. Therefore, NSPs or another third party have a critical role in determining whether to invest in demand- or supply-side solutions in that suburb. Given that the electricity network extends far beyond the suburb level, and decisions at many hundred of uncoordinated consumers affect network costs, the role of NSPs and other intermediaries becomes even more critical.

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3. The potential and limits of cost-reflective pricing

Section 3 highlights that energy prices are distorted both temporally and spatially, which results in overconsumption in some times and locations, resulting in higher overall energy prices.

Time-of use pricing

There is clear evidence from numerous trials that improving the cost reflectivity of energy prices is one option to move consumption towards more optimal patterns. Trials have indicated that critical peak pricing is the most effective form of time-of-use pricing, potentially reducing peak demand by 30 per cent or more[4]. To ensure that a critical peak price is as cost-reflective as possible, it should include both wholesale energy costs and network costs. This would require NSPs to provide price signals either directly to energy consumers or indirectly by providing time-of-use price signals to retailers.

Where time-of-use pricing is introduced, most consumers will still face information barriers and transaction costs in responding to critical peak pricing. As a result, the impact of critical peak pricing is greater when accompanied by information programs, technologies that help consumers respond to peak pricing and third-party services that can assist consumers optimise their energy use.

The Energy Efficiency Council recognises that critical peak pricing is one option to address pricing distortions and, where it is adopted, will need to be introduced with load-control technologies, programs and access to competitive demand-side services that can help consumers respond to critical peak pricing.

However, critical peak pricing may not always be the most cost-effective way to optimise demand and, more importantly, there are challenges that mean that cost-reflective pricing is likely to take decades to become widespread, if it does become widespread.

Practical challenges to time-of-use pricing

There are major practical and social barriers to introducing critical peak pricing. Firstly, consumers will need to have a time-of-use meter installed, and there is currently considerable public opposition to the roll out of time-of-use meters. Secondly, political considerations mean that consumers will need to voluntarily take up critical peak pricing. As a result, it would take at least a decade before time-of-use pricing is widespread and it may never become widespread.

In summary, while the Energy Efficiency Council supports the roll out of critical peak pricing where it is cost-effective, the Council strongly recommends that the AEMC adopt the position that:

> *'critical peak pricing is desirable, but will take at least a decade to implement in Australia and, even when it has been implemented there will continue to be imperfect price signals, particularly location-specific price signals. As a result, a number of policies need to be introduced on a transitional or permanent basis to optimise energy demand and protect consumers.'*

Location-specific pricing

The barriers to location specific pricing are greater than the barriers to time-of-use pricing. Regulations currently require postage-stamp pricing, where consumers must be charged the same amount for electricity irrespective of their locations. Even if this rule was overturned, the technical barriers to introducing nodal pricing are substantial, and the ability of consumers to respond to nodal pricing are substantial.

Alternatives to cost-reflective pricing

In the absence of time-of-use pricing, minor changes need to be made to the energy market rules to enable energy consumers to sell demand-response into energy markets. The Energy Efficiency Council's recommendations in relation to this are set out in Section 4. In the absence of location-specific pricing, NSPs will continue to have a critical and obligatory role in correcting the lack of location-specific pricing by funding location-specific reductions in demand where it is cheaper than location-specific investments in infrastructure. The Energy Efficiency Council's recommendations in relation to this are set out in Section 5.

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[4] Futura Consulting 2011, *Investigation of existing and plausible future demand side participation in the electricity market – a report for the AEMC*, Futura Consulting, Melbourne.

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4. Demand-response and the wholesale market

Most small energy consumers do not have a time-of-use meter and cannot buy energy from the wholesale energy market, although many are now securing some of their energy supply from on-site distributed generation. Typically, small energy consumers purchase the bulk of their energy through a retailer that provides valuable hedging services, and they do not have the option of taking up a critical peak pricing offer unless their retailer offers them that option.

Most large energy consumers currently have time-of-use meters and have the option of buying energy from:

- The wholesale market – This provides a critical peak price for energy, enabling consumers to benefit from demand-response. However, the risks and transaction costs of buying from the wholesale market outweigh the benefits for many energy consumers.
- A retailer – retailers substantially reduce enegy price risk. While most retailers offer large customers a tariff that includes peak, off-peak and shoulder rates, many do not offer a critical peak price tariff system and, even when they are offered, many consumers don't take up these tariffs because they don't have the understanding to have confidence that they can benefit from such pricing structures.

Furthermore, whether an energy consumer buys from a retailer or the wholesale market, they will still not receive a critical peak price signal for network infrastructure use.

The Energy Efficiency Council recommends that energy consumers be provided with more choice by allowing them to buy electricity from a retailer but sell their demand-response separately into the energy market or to a demand-side service provider (which could be their retailer, another retailer or a non-retailer). Unbundling retail and demand-response would increase competition and allow energy users to:

- Benefit from reducing their demand during peak demand periods without losing the protection that retailers provide from other factors in the energy market; and
- Seek assistance from third-parties to respond to peaks, and fund this relationship with the third party through the benefits from reducing demand during peak periods. However, a consumer could also sell into the wholesale energy market directly.

The separation of demand-response services into a clear service will require the establishment of clear rules, regulations and guidelines to ensure that consumers are protected when they engage with third-parties that provide these services. The Council recommends the development of a consumer-protection framework alongside the development of the demand response system.

Whilst the Energy Efficiency Council supports separation of retail and demand-side services into sepearate contestible markets, it should be noted that not all members hold this position.

Finally, the Council notes that, if a capactiy market was introduced into the National Electricity Market at some point in the future, an energy consumer could sell their demand-response into the capacity market instead of the wholesale energy market. The global evidence suggests that capacity markets that include demand-response unlock greater volumes of DSP than other mechanisms. The Council has not settled on a capacity mechanism as the preferred option to drive DSP, but believes that it is entirely inappropriate that the AEMC would exclude consideration of a capacity market from the DSP III review without substantial justification.

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Recommendations

- Unbundle' energy retail and demand-response by:
  - Adjusting the National Metering Identifier Procedure (NMI) to allow a single site, and a single meter, to be split into two services – an electricity consumer and a demand-response provider.
  - Creating a new category of energy market participant, called a 'demand-response provider', and allow responsibility for that participant to be contestable and with allocation possible to a designated party, whether that is the energy user, a retailer, an aggregator or another party that meets the criteria and behaviours established in the rules for 'demand-response provider'
- Establish protocols for the combination of metering and inference required to determine how much demand-response has been supplied by a 'demand-response provider'
- Enable demand-response to be sold into a market. This paper examines a mechanism to sell demand-response to be sold into the energy-only wholesale market. Alternatively, demand-response could be sold into a capacity market.
- Support 'demand-response providers' to also sell the demand-response to NSPs to enable them to avoid investment in network infrastructure. This transaction may need to be overseen by the Australian Energy Regulator (AER) given that NSPs have monopoly power in setting prices for demand-response in this type of transaction. This is critical to both address NSP issues and reduce split incentives.
- Set up appropriate rules for demand response providers to protect consumers.

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5. Network Service Provider (NSP) incentives and regulations

As noted in the AEMC Directions Paper, NSPs are monopoly ‘agents’ for energy consumers, generators and other market participants. In particular, as energy prices do not reflect spatial differences in the cost of energy supply, NSPs have a critical role on behalf of consumers of correcting spatial pricing distortions by investing in location-specific DSP.

Incentives and regulatory problems mean that there are principal-agent problems, and NSPs do not always act in the best interest of their clients (e.g. energy generators and consumers). The NEM will need to use all three of the mechanisms that are available to ensure that NSPs’ interests and actions align with energy consumers’ interests. These are:

- Ensuring that NSPs have the right incentives to undertake DSP; and
- Opening up the market for DSP to competition, so that other parties can capture the benefit of DSP if NSPs are not willing or able to undertake DSP; and
- Regulating network businesses to ensure that they undertake DSP or purchase it from third parties.

Aligning the incentives for network businesses

Network businesses have substantial incentives to over-invest in network augmentation, and therefore a negative incentive to invest in DSP that reduces the need to augment the network. This issue was outlined in detail by Professor Ross Garnaut in his recent update report.

The National Electricity Rules (NER) makes some attempt to align the incentive of NSPs with the interests of their principals in relation to DSP. Section 6.6.3 of the NER enables the AER to:

> *“...develop and publish and incentive scheme or schemes (demand management incentive scheme) [DMIS] to provide incentives for [NSPs] to implement efficient non-network alternatives or to manage the expected demand for standard control services in some other way”*

The AER has recently established DMIS schemes in New South Wales, ACT, Victoria, South Australia and Queensland. While these schemes do provide an incentive for DSP, including incentives to address foregone revenue, it is unlikely that, on their own, these schemes will reverse the substantial incentive that NSPs have to over-invest in network augmentation.

Furthermore, the historical focus of NSPs on network augmentation has left them critically under-skilled in understanding both the potential for DSP to reliably reduce peak demand, and the options for using DSP effectively. Like any business, if NSPs are presented with two options that have similar returns on investment (i.e. DSP and network augmentation), and they have a poor understanding of DSP, they will inevitably favour network augmentation.

While some NSPs have made some effort to improve their DSP skills, the culture and skills sets of every network business in Australia still substantially favours network augmentation over DSP. This means that network business are likely to both under-invest DSP directly and under-invest in DSP services from other parties.

The Energy Efficiency Council believes that reform to align NSPs incentives is critical, but given the lack of progress to date the time has come to take a more regulatory approach. This would overcome the self-reinforcing cycle where NSPs do not invest in DSP and so they do not develop the skills to invest in DSP, which reduces the likelihood that they invest in DSP.

Recommendations

- Engage with NSPs and ensure that NSPs have appropriate incentives to invest in DSP. This will require, at a minimum decoupling NSP revenue from energy throughput and linking financial incentives to reaching certain DSP benchmarks.

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Regulations

NSPs are natural monopolies, and so it is critical to not only provide them with appropriate incentives to also oversee and regulate their activities to ensure that they are acting in their customers' best interests. The NER makes some attempt to provide oversight of network companies, to ensure that they are investing in DSP when it is the best interest of energy consumers. For example:

- Section 5.6.2 of the National Electricity Rules states that when distribution and transmission network operators are planning to augment the network, they must first consider whether demand-side options can deliver the same outcome at a lower cost.
- Sections 6.5.6, 6.5.7, 6A.6.6 and 6A.6.7 in the National Electricity Rules provide the AER with discretion to "reject proposals for capital expenditure on network infrastructure if non-network alternatives would be more economically efficient"[5]

However, regulatory oversight of NSPs has been weak, and the AER has recently publicly stated that they do not have sufficient power to regulate NSPs effectively. The combination of distorted incentives and weak regulation means that the vast majority of NSPs have seriously underinvested in DSP. Furthermore, some NSPs appear to have exploited their monopoly power to exclude competition or derive benefits in ways that would be deemed unacceptable in any other sector of the economy.

The NEM now has a 15-year history of tinkering to address this issue, and it is clear that far more directive action is required. Such directive action is common in energy markets in the US and Europe. The Energy Efficiency Council recommends a three pronged approach to driving DSP through clear regulations:

- An NSP obligation to encourage spatially- and temporally-specific DSP to reduce peak demand and addresses identifiable network constraints (NSP as point of obligation)
- A retailer obligation (Energy Saving Initiative) to encourage general DSP. Currently, the value of deferred or avoided network augmentation can only be projected over a short period of time, which means that an NSP obligation will not encourage all cost-effective DSP (see section 7).
- Better regulation of the network planning and augmentation process

Recommendations

- Place an obligation on network companies to invest in a minimum level of DSP in order to build their capacity and address internal supply-side biases. A number of options should be considered, including a mandatory requirement for network companies to purchase a certain quantity of DSP through a target to either:
    - Offset at least 50 per cent of expenditure on peak-demand-growth-driven network augmentation using DSP; or
    - Directly invest or purchase DSP each year equivalent to 10 per cent of their capex expenditure.
- Require NSPs to offer DSP opportunities on the open market. The NSP should be allowed to bid for the DSP opportunity if it chooses, but the bidder with the best offer (considering both quality and cost) should be selected.
- Require network companies to publish an annual statement of opportunities for DSP
- Increase the AER's powers to regulate network companies. In particular, if a network company seeks to have a decision by the AER reviewed, the entire AER determination should be re-assessed, to avoid 'cherry-picking' of AER determinations.

[5] Crossley, D. 2011 Demand-Side Participation in the Australian National Electricity Market: A brief Annotated History, Regulatory Assistance Project, Montpelier, Vermont. P 10

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6. Barriers to cogeneration

In addition to the generic barriers for demand-side participation, there are specific barriers to distributed generation. This submission focuses on the barriers to cogeneration and trigeneration, although they are relevant to other forms of distributed generation. In this submission, the term 'cogeneration' refers to both cogeneration and trigeneration.

Difficulties in grid connection

Connecting cogeneration units to the grid can deliver benefits to the network and improve the economics of cogeneration projects. While cogeneration can deliver benefits to the network, there are genuine technical issues and costs for connecting cogeneration units, particularly where fault levels need to be addressed. The costs and benefits of connecting a cogeneration unit to the network will vary on a case-by-case basis, and so need to be set on a case-by-case basis.

Currently, when a proponent wants to connect a cogeneration unit to the grid they have to negotiate with a single distribution businesses that is given monopoly power in relation to grid connection. The incentive structure and culture of many network businesses discourages them from actively supporting grid connection.

The monopoly power of distribution businesses, particularly privatised distribution businesses, is a *prima facie* case for regulating the cogeneration connection process. While some distribution businesses have been reasonable in negotiating connection to the grid, the unjustifiable behaviour of other distribution businesses makes it clear that regulation is essential. The current process for connecting a cogeneration unit to the grid is extremely arbitrary, and can include:

- Uncertain and often completely unjustifiable timeframes for negotiating an agreement
- Uncertain and often unjustifiable costs for studies to determine the costs of connecting to the grid.
- Uncertain and often unjustifiable costs for connecting to the grid.
- Inequitable rules about who pays for network upgrades to facilitate cogeneration. Currently, the last cogeneration unit that wants to connect to the grid before an upgrade is required to pay the full cost of the upgrade, despite the fact that other units may connect before or after the upgrade. In contrast, the cost of upgrades to the grid to address rising energy demand are generally smeared across all energy users.

These issues are exacerbated by the low numbers of appropriately skilled technical experts that can assist in grid-connection. Some jurisdictions have developed guidelines on cogeneration connection, but there is still no NEM-wide regulated process for cogeneration connection. A number of processes are underway that could partially address these issues, like the AEMC's 'Comprehensive Technical Standards Review', but even if these deliver on their potential there will still be major gaps.

Recommendations:

- Establish a distributed generation ombudsman in the Australian Energy Regulator. The ombudsman would ensure adherence with a standard connection process and enforce rules about who pays those costs of any upgrades to the grid.
- Annual maps of the costs and benefits of connecting cogeneration at different points on the grid, including potential payments for offsetting infrastructure investment. The pre-emptive analysis of the costs and benefits of connecting to the grid at different points would provide greater information transparency, opening up competition in the market.
- Establish a standard national grid connection protocol in line with the procedure recommended in the ClimateWorks 2011 report *'Unlocking the barriers to cogeneration: Project Outcomes Report'*

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Payments for network benefits

As noted above, cogeneration can provide location-specific benefits, saving distributors from having to augment grid infrastructure. Paying cogenerators for these benefits will encourage them to deliver these services.

> ***Recommendations***
>
> - Establish transparent system for paying cogenerators for network benefits

Difficulties in retailing and distributing electricity

The benefits of cogeneration come from being able to provide both energy services (heat and cooling) and electricity. However, a number of current regulations and processes impede cogeneration owners from being able to capture these benefits. These include:

- Rules preventing cogenerators from using the distribution network to move energy between sites (e.g. two council offices) at a cost that reflects the actual cost of using the network to move energy such short distances. These rules are being addressed in some jurisdictions.
- Rules that state that if cogenerators export electricity into the grid it has to be sold at wholesale prices.
- Rules that prevent cogenerators selling electricity to all buildings on a site as regulated monopolies. The rules generally require consumers to have access to multiple retailers, which limits the ability for cogenerators to have a secure market for their power.

> **Recommendations**
>
> - Amend key rules to allow cogeneration owners and operators to sell electricity directly to energy users and set up a simple, transparent system that gives cogeneration owners and operators the option to sell electricity at sites as ‘light red-tape’ regulated monopolies.
> - Develop virtual private wire rules that allow cogenerators to use the public electricity network to supply electricity to local sites (e.g. multiple council buildings) but only pay cost reflective distribution costs.

Issues with gas infrastructure

In some regions gas infrastructure is inadequate to support cogeneration. If a proponent wants to develop a project they are often required to both pay for the full cost of augmentating the gas network and then charged a service fee for the ongoing use of the network. Subsequent cogeneration developers are only required to pay the ongoing service fee. This creates a ‘first mover disadvantage’, as discussed in Chapter 19 of the Garnaut Review (2008).These issues will become increasingly critical if there is a major expansion of both centralised and distributed gas-fired generation.

> **Recommendations**
>
> - Invest in the backbone gas supply network
> - Set clear rules about who pays for minor expansions of the gas network
> - Undertake a national study into competition and accessibility in gas supply.

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Delays in addressing barriers and first-mover disadvantage

The Energy Efficiency Council recommends addressing the main barriers to cogeneration directly (see above). However, there are still numerous barriers that will take many years to completely address, and first-movers will face higher costs to overcome these barriers.

Recent work by CSIRO indicated that Australia could develop over 5,000 MW of cogeneration by 2020. This level of cogeneration would deliver substantial benefits to the economy, including grid stabilisation of the grid as more intermittent supply comes on board.

Recommendations

The Council recommends that the first 3,000 MW of cogeneration in Australia should receive financial support. The incentive should only be provided to cogeneration that:

- Exceeds a minimum threshold of efficiency (e.g. 50 per cent), with additional incentives for cogeneration units as their efficiency increases beyond this threshold; and
- Is below 30 MW and runs for more than a certain number of hours per year.

In addition to addressing first-mover disadvantage, the incentive could be used to reward cogeneration providers for the network benefits that they provide to the electricity network.

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7. Energy Efficiency Certificate Schemes

There is a strong justification to introduce a national Energy Saving Initiative, as set out in the Energy Efficiency Council's submission on the Energy Saving Initiative (attached). The Council recommends that the AEMC note the important role of energy efficiency certificate schemes, but leave the analysis and work on these schemes, including the case for their introduction, to the Australian Government's Energy Saving Initiative Secretariat, which is carrying out significant work in this area.

Recommendations

- The AEMC should note the important role of energy efficiency certificate schemes, but leave the work on these schemes, including the case for their introduction, to the Australian Government's Energy Saving Initiative Secretariat, which is carrying out significant work in this area and will ultimately report to the Council of Australian Governments.

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