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

2 September 2011

Re: Project Number EPR 0022- Stage 3 Demand Side Participation Review Issues paper,

Dear Mr Pierce

The Australian Energy Market Commission (AEMC) has sought comment on the Issues paper for "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 and cogeneration in business and the public sector, 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 AEMC's Stage 3 Demand-Side Participation (DSP) review could deliver significant benefits to Australia. DSP includes a range of activities like energy conservation, energy efficiency, reducing demand at times of peak load and distributed generation. Recent estimates suggest that DSP could reduce retail costs of electricity by 10 to 25 percent per Megawatt-hour (MWh). These savings are largely due to reductions in peak demand, and consequent reductions in the costs of augmenting network infrastructure and hedging. The savings would be substantially higher if reductions in total energy consumption are taken into account.

The need to address DSP has been acknowledged for some time. The National Electricity Objective (NEO) is:

> *To promote efficient investment in, and efficient operation and use of, electricity services for the long-term interests of consumers of electricity...*

An electricity market that involves a combination of supply-side activities (e.g. generation) and DSP will be significantly more cost-effective than a market that only involves supply-side activities. Therefore, the National Electricity Market (NEM) must support DSP. The early concepts for the NEM envisaged a strong role for DSP, and the 1992 '*National Grid Protocol'* states:

> *Demand management and renewable energy options are intended to have equal opportunity alongside conventional supply-side options to satisfy future requirements. Indeed, such options have advantages in meeting short lead-time requirements.*[1]

However, the level of DSP in the NEM is substantially lower than comparable markets, like Western Australia, New Zealand, the United Kingdom and many states in the United States. For example, DSP is forecast to meet ten per cent of the Western Australian Electricity Market's peak load by summer 2012/13.

The failure to capitalise on the potential of DSP is significantly increasing electricity prices. Network companies are planning to spend $39 billion in just five years to augmenting the electricity network. Much of this investment is driven by peak demand, with an estimated $3.5 billion of current assets used for just 40 hours a year. DSP could reduce peak demand in the NEM, reducing expenditure on the grid and saving electricity consumers over $1 billion a year.

The Energy Efficiency Council submission examines the problems that are preventing the uptake of DSP in three sections:

1. General barriers to energy consumers directly undertaking DSP
2. Barriers to third parties and market participants supporting DSP
3. Specific barriers for taking up distributed generation opportunities

[1] National Grid Management Council 1992, *National Grid Protocol: First Issue*. Melbourne, NGMC p iii

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The Energy Efficiency Council believes that the issues paper puts too much emphasis on the role of energy consumers directly undertaking DSP. The National Electricity Market is not a simple, natural market. It includes network infrastructure, regulated monopolies and barriers that prevent intermediaries from reducing transaction costs. In this context, expecting energy consumers to optimise their level of DSP without any support from third-parties and specific DSP schemes is preposterous. The Council recommends that the AEMC focus this review on DSP schemes and barriers to third-parties driving DSP.

The Council's submission starts with an analysis of the drivers and barriers for consumers to undertake DSP. This section clearly identifies that consumers would be unable to take up optimal levels of DSP on their own because:

- Electricity prices do not reflect the costs of supply at the time, location or 'peakiness' of demand
- Consumers face imperfect information and bounded rationality
- Principal-agent problems prevent optimal decisions, in particular principal-agent problems where network businesses act as monopoly agents for energy consumers
- Coordinating DSP activities across multiple consumers has substantially greater benefits than uncoordinated DSP

As with other markets, market intermediaries can assist consumers and help optimise the electricity market. Third-parties like network businesses, electricity retailers and Energy Service Companies (ESCOs) can either assist energy consumers to take up DSP options or make decisions on behalf of consumers that help them maximise the collective benefits from DSP. However, there are substantial barriers that prevent DSP facilitators and aggregators from taking up DSP opportunities. The Energy Efficiency Council recommends that the DSP review focus on barriers to issues for third-parties, including:

- Ensuring that DSP proponents can capture the benefits of DSP, through:
    - A national Energy Saving Initiative, comprising an obligation on electricity retailers, as recommended by the Prime Minister's Task Group on Energy Efficiency
    - A structure that provides the stability for long-term DSP investments
    - Contracts that provide portability
    - A pool bidding and pricing structure that supports DSP
- Capturing the benefits of DSP from avoided network infrastructure:
    - A clear obligation on network companies to reduce peak demand
    - Ensuring that network businesses have the right incentives to undertake DSP
    - Improve regulatory oversight of network businesses.
- Opening up the DSP market to competition

These issues are well-known and have been examined numerous times through reviews like the Parer report. Despite these extensive reviews, the NEM is still failing to capitalise on the potential for DSP. This Energy Efficiency Council looks forward to working closely with the AEMC to examine best-practice in DSP around the world and develop a concrete set of recommendations that will finally unlock the potential for DSP in the NEM.

Yours sincerely

Rob Murray-Leach

Chief Executive Officer

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Summary of Recommendations

The Energy Efficiency Council strongly recommends that the AEMC focus the DSP review on fixing the incentives for network businesses and tackling the barriers that prevent third-parties like network businesses, retailers, aggregators and energy service companies (ESCOs) from supporting energy consumers to play a role in DSP.

Capturing the benefits of DSP

1. Harmonise existing state energy efficiency schemes into a single national Energy Saving Initiative (ESI) to drive general demand reduction. The Council recommends that retailers should be obligated parties, as competition between retailers will encourage ESI targets to be met more cost-effectively.
2. Create a structure for encouraging DSP that provides long-term certainty for investors, rather than further short-term 'trials'
3. Structure DSP contracts so that:
    - The DSP provider can sell their service to their network company (peak load reduction, frequency control etc.) at fair prices. This will require network companies to receive appropriate incentives and be subject regulatory oversight.
    - The DSP provider can sell their services to any retailer that is willing to purchase the DSP service, rather than just the retailer supplying the energy consumer.
4. Develop and implement a firm recommendation to provide appropriate prices for DSP services in a pool. The AEMC should consider a number of options, including pay as bid and five-minute pricing.
5. Reform electricity pricing

Capturing the benefits of DSP from avoided network infrastructure:

6. Place an obligation on network companies to reduce peak demand in ways that defers network augmentation. A number of options should be considered, including a mandatory requirement for network companies to purchase a certain quantity of DSP from third-parties through a target to either:
    - Reduce peak demand by a certain quantum (e.g. collectively reduce network augmentation in the NEM by $1 billion a year).
    - Invest the equivalent of 10 per cent of their capex expenditure per annum on DSP
7. Ensuring that network companies have incentives that encourage them to invest in DSP
8. Require network companies to publish an annual statement of opportunities for DSP
9. 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 up for re-assessment

Open up the DSP market to competition

10. Use a white-certificate scheme for a national Energy Saving Initiative, as this allows retailers and other third parties to sell DSP services on an open market.
11. Regulate time-frames and costs for energy consumers and third parties (with consumers' permission) to access data on energy consumers demand patterns
12. Require publications of annual maps of network constraints and opportunities for DSP that could offset network augmentation.

Information

13. Examine the role of third-parties in addressing information barriers
14. Time of use billing should include the rates for peak, shoulder and off-peak use and user consumption during peak, shoulder and off-peak times

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Tackle the barriers to cogeneration

15. Set standard national grid connection rules that include:
    - A maximum of three months for a connection study
    - A method for determining the cost of connection studies.
    - A method for determining the cost of connection and benefits from network services
16. 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.
17. Establish a distributed generation ombudsman in the Australian Energy Regulator. The ombudsman would ensure adherence with the standard connection process and enforce rules about who pays those costs of any upgrades to the grid.
18. Establish a transparent system to pay distributed generators for avoided TUOS and DUOS
19. Amend key rules to allow cogenerators to sell electricity directly to energy users at appropriate rates.
20. Develop virtual private wire rules to allow cogenerators to use the public electricity network to supply electricity to local sites (e.g. multiple council buildings) and only pay cost reflective DUOS.
21. Amend certain rules to allow cogenerators to sell directly to tenants at some site as regulated monopolies.
22. Invest in the backbone gas supply network
23. Establish clear rules about who pays for minor expansions of the gas network
24. Undertake a national study into competition and accessibility in gas supply
25. Set up an incentive scheme for the first 3,000 MW of cogeneration in Australia to address first-mover disadvantage, and potentially reward cogeneration providers for the benefits that they provide to the electricity network. 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.

Recommendations that are likely outside the remit of the AEMC

- Address principal agent problems in commercial buildings through a mixture of tools such as Green Leases and financing schemes like the New South Wales Government's 'Environmental Upgrade Agreements' and City of Melbourne loan scheme.

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Section 1. Drivers and barriers for consumer decisions

1.1 Drivers for consumer decisions

The highly regulated structure of the electricity market has a profound impact on consumers' energy consumption. However, understanding this impact requires a brief discussion of the drivers for consumers' energy consumption. The drivers vary significantly among the various classes of consumers (e.g. households, commercial businesses and manufacturing) and amongst individual consumers, but there are a number of overarching factors, including:

- **Demand for specific goods and services**

  Electricity demand is derived from consumers demand for another good or service, such as warmth, light and entertainment. The demand for goods and services are affected by multiple social and economic factors, including disposable income and social factors.

- **Cost and availability of key technology**

  The amount of energy that an energy user will consume to meet their demand for a good or service will depend on the technology that is available. For example, passive house design can enable households to meet their demand for warmth with low or no energy demand.

  Similarly, the arrival of flat screen televisions in the mid-2000s enabled households to install much larger television screens into their homes. This substantially increased energy demand. The subsequent shift to cost-effective LED screens, partly driven by appliance standards, allowed the demand for larger screens to be met with substantially lower energy use.

  Technology can also mediate energy use by other appliances. For example, well-designed powerboards enable households to directly reduce appliance standby energy use. Similarly, devices that allow appliances to be controlled remotely enable third-parties to reduce households' energy demand on their behalf. For example, control units that allow third-parties to switch off chiller units in commercial buildings for short periods during periods of peak electricity demand. Remote load shedding is not fully mature, and most existing commercial buildings and industrial sites were not designed for simple load control. Nevertheless, control technologies offer considerable opportunities to the NEM.

- **Markets for goods, services and technology**

  The ability for an energy user to access the goods and services that they demand, or the technology that can meet that demand, will depend on the features of specific markets. The features of markets are the outcome of complex interactions between parties, and there can be significant inertia in markets.

  For example, hot water systems tend to be replaced at the point of failure, meaning that households take the advice of the plumber on call in determining which system to install. When plumbers lacked the skills to install solar hot water, they tended to recommend against installing solar hot water systems. This dampened demand for solar hot water systems, in turn reducing the pressure on plumbers to learn the skills to install those systems. Proactively training plumbers in solar hot water systems was critical to overcome a vicious cycle that was dampening the demand for solar hot water systems.

  Of particular relevance to this review is the market for energy service companies and demand-side facilitators and aggregators in Eastern and Southern Australia. The market for these services has been substantially constrained by problems with the NEM. This is discussed in Section 2.

- **The price of electricity**

  Although electricity is a derived demand, consumers should theoretically weigh up the costs of electricity along with other costs and benefits in making decisions that impact energy use. The way that electricity prices are structured will affect the way that consumers respond, particularly whether prices reflect the true cost of energy use, including the time and location of electricity use. The separation between charges for electricity consumption

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(MWh) and infrastructure costs (determined mainly by the location and timing of demand for electricity (MW)) are particularly critical. As discussed later, the ability of consumers to respond to electricity prices varies markedly between consumers.

- **Capital**

  Irrespective of the balance of costs and benefits, consumers ability to invest in technologies and services that meet their demand for goods and services or mediate their energy demand will depend on capital availability.

- **Information and decision-making**

  Consumer choices, including their demand for goods and services, demand for technology and demand for electricity are affected by the information that they have and their ability to process it.

- **Regulations and government programs**

  Regulations and government programs can affect consumers demand for goods and services, demand for technology and demand for electricity. For example, appliance standards assist consumers to purchase more energy efficient appliances and lower the cost of more efficient appliances. This is discussed in more detail in the next section.

These drivers interact in complex ways. For example, consumers demand for some services (e.g. pool pumping) is highly elastic, and so electricity demand for these services is elastic. In other cases (e.g. electric motor use in factories) demand in both quantity and timing of the service can be inelastic, and unless there are technologies that allow this demand to be satisfied with less energy, demand for electricity will be relatively inelastic.

In the absence of market failures or regulatory failures, consumers are the best-placed individuals to balance this complex range of factors. However, there a number of substantial barriers that prevent consumers from optimising their energy demand, which are discussed in Section 1.2.

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1.2 Limits on the ability of consumers to optimise their demand

The AEMC issues paper appears to assume that consumers should be the sole decision maker in regards to demand-side investment in the NEM. However, there are substantial reasons why this position is untenable.

First Consumer Barrier: Imperfect price signals

Consumers do not receive perfect price signals to guide their energy demand, and it is unlikely that they ever will. Firstly, there are several externalities, including greenhouse gas emissions, which are not incorporated in electricity prices. Secondly, many consumers have their total electricity costs subsidised. This is not just limited to low-income households, with some very large industrial energy users, such as aluminimum smelters, receiving significant subsidies. Thirdly, there is significant smearing of prices across consumers, locations and time.

- **Peak demand cross-subsidisation**

  There is extensive cross-subsidisation between energy users. The Parer Review noted that residential consumers with very 'peaky' demand profiles were subsidised by other users. For example, when a household in Queensland installs an air conditioning unit, it requires around $3,000 of investment in the grid per kW of air conditioning. This cost is smeared across energy consumers, so the household that installed the air conditioning does not cover the cost of its decision. Political factors mean that it is highly unlikely that households will ever be charged in a meaningful way for their peak demand, which means that they will not receive the right price signals to guide their decisions.

- **Spatial cross-subsidisation**

  The cost of providing electricity infrastructure varies from place to place, but this variation is rarely reflected in costs. Although this issue is often simplified as 'urban users subsidise rural users', in fact the true cost of electricity provision can vary substantially within cities and regions. Political factors mean that regional cross-subsidisation is unlikely to change soon, and finer-grained nodal pricing is exceptionally unlikely.

- **Time-of use smearing**

  Very few consumers pay true time-of-use electricity costs. Even if consumers did face true time-of-use pricing, many consumers have an extremely limited ability to respond to time-of-use prices without assistance. For example, the costs for consumers to monitor and respond to rapid variations in real electricity prices as (e.g. much higher prices during short periods of peak demand) would likely outweigh any benefit to the consumers. The electricity market already recognises this to some extent, and retailers effectively shield householders against price volatility in the NEM wholesale spot market.

The Energy Efficiency Council supports the broad intent to reduce distortions in energy prices, including the Australian Government's proposal for a carbon price to incorporate the environmental costs of greenhouse gas emissions in the price of electricity. However, we must recognise that the range of obvious and subtle distortions to electricity prices are highly unlikely to be completely eliminated. Imperfect pricing means that, even in the absence of other barriers, electricity consumers will not alter their electricity consumption patterns in a way that optimises supply and demand in the energy market.

Therefore, the Energy Efficiency Council recommends the use of approaches that directly incentivises energy users and market intermediaries to optimise supply and demand. These include:

- A national Energy Saving Initiative to reduce general demand
- A scheme to reduce peak demand in specific locations to avoid investment in electricity network infrastructure.

These recommendations are discussed in detail in Section 2.

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Second Consumer Barrier: Information, bounded rationality and misaligned incentives

As in many other markets, consumers do not have access to perfect information in balancing their demand. However, information problems are particularly egregious in electricity markets because:

- There is imperfect provision of information with public good characteristics
- Electricity use is largely invisible and the impacts of energy-use decisions (i.e. energy bills) are only received long after decisions are made
- The lack of visibility of energy use creates significant information asymmetries. It is difficult to determine the energy demand of various technologies both before and after they are purchased. Although some goods now have energy-use labels, where multiple devices, structures and behaviours interact (e.g. warming homes) consumers find it difficult to determine their actual energy use.

Even with access to good information, consumers often make poor decisions due to a number of inaccurate heuristics. Poor heuristics are used at both at the household level (e.g. exceptionally high levels of future discounting) and at the company level (e.g. decisions to treat investments in energy efficiency as 'maintenance' rather than 'investments'). Bounded rationality is particularly relevant in responding to time-of-use pricing. These issues are discussed at more length in Garnaut (2008) and the Report of the Prime Minister's Task Group on Energy Efficiency.

There are number of policies that should be deployed here, that may be outside the remit of the AEMC, including:

- Investing in information, training, education and accreditation (see the response to question 17 in section 4 of this submission)
- Appliance standards
- Incentives like the Tax Breaks for Green Buildings

Recommendations for AEMC

- Examine the role of third-parties in addressing information barriers
- Time of use billing should include the rates for peak, shoulder and off-peak use and user consumption during peak, shoulder and off-peak times

Third Consumer Barrier: Barriers that inhibit the use of third parties

Gaps in information, skills and high transaction costs can make it non-economic for individual consumers to optimise their pattern of energy consumption. In well-functioning markets, these issues are solved by market intermediaries, who can use economies of scale to develop skills, gather information and perform functions on behalf of multiple consumers.

For example, for the vast majority of energy consumers, the costs of monitoring and responding to periods of peak load would outweigh the benefits. However, a third party with the right information technology and remote load control technology could:

- Identify DSP opportunities at numerous sites, such as switching off commercial building 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 DSP 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

However, the NEM does not currently provide a market structure that supports third parties to provide DSP services. While there are also a number of technical and contractual issues in relation to remote load shedding that need to be worked through before the practice can become very

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widespread, the market structure needs to be in place before these issues can be resolved. Section 2 analyses the barriers for third-parties to facilitate and aggregate DSP in the NEM.

Fourth Consumer Barrier: Principal Agent Problems in non-electricity markets

Even if several parties have a collective incentive to reduce their energy use (e.g. building owners and tenants), misaligned incentives between principals and agents can prevent them from making decisions that maximise their joint welfare.

For example, although tenants would substantially benefit from investments in improved energy efficiency, landlords would need to make those investments and would be unlikely to gain any benefit from doing so. The way that contracts are structured between landlords and tenants does not support retrofitting in either residential or commercial buildings. A number of factoirs have started to overcome principal-agent barriers in premium grade office buildings, but principal agent barriers remains a very real issue for the majority of the commercial building market, in particular where building owners have multiple small tenants.

Recommendations (likely outside the remit of the AEMC)

- Address principal agent problems in commercial buildings through a mixture of tools such as Green Leases and financing schemes like the New South Wales Government's 'Environmental Upgrade Agreements' and City of Melbourne loan scheme.

Fifth Consumer Barrier: Principal-Agent Problems in the NEM

While energy users have some control over their energy demand, many decisions are made by their 'agents' in the NEM. For example, even if perfectly informed consumers received completely perfect price signals, they still rely on electricity network businesses to respond to their energy use decisions in the way that they invest in infrastructure. Theoretically, network businesses should respond to consumer decisions in ways that maximise benefits for consumers. It appears that this is not occurring.

Network businesses should consider both peak demand and consumption when determining the cost benefits of DSP versus network augmentation (i.e. peak demand reduction is much more cost-effective when the peaks are much higher than average demand). However, network businesses are still assuming that energy consumption is rising, when in fact it has been declining for the last few years.This is likely to result in overinvestment in distribution infrastructure, which increases electricity costs. Professor Ross Garnaut estimates that 68 per cent of recent rises in electricity prices have come from investment in electricity transmission and distribution infrastructure.

Distribution businesses are monopolies – energy consumers do not have the ability to switch to another distribution business if they feel that their distribution business is making poor investment decisions. Consumers are in a weak position to influence distribution businesses' behaviour. The result for energy consumers is that, even though they are responding somewhat to energy prices, distributors' investment decisions are not reflecting their choices. In other words, there are principal-agent problems between consumers and distributors.

The role of distributors is even more critical when we reflect that consumers are not receiving perfect 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 if it's more efficient than augmenting the network. Therefore, distributors or another third party will need to determine whether to invest in demand- or supply-side solutions in that suburb. Given that the electricity network extends far beyond the suburb level, the role of network businesses and other intermediaries becomes even more critical. These issues are discussed in more detail in Section 2 of this submission.

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1.3 Types of electricity consumer

There are significant differences between the types of electricity consumer and their ability to engage in DSP on their own, or with the support of third parties.

Large energy consumers

Very large energy consumers are the most capable of undertaking DSP on their own and many are already undertaking some level of DSP. However, they have significant potential to expand their level of DSP, particularly through coordination with other energy users.

Large energy consumers are theoretically in a reasonable position to undertake DSP because they:

- Use sufficient quantities of electricity to justify the costs of directly monitoring energy prices and optimising their patterns of energy use
- Sometimes buy their electricity directly from the electricity market, which means that they receive clearer (although by no means perfect) price signals about the time, location and peakiness of their energy use. However, it is notable that many large energy consumers still buy their energy from retailers.

Despite these conditions, there is substantial evidence that most large energy consumers have not been optimising their energy use. The Energy Efficiency Opportunities Act required around 200 of Australia's largest energy users to rigorously identify opportunities for energy savings. Theoretically, these companies have a large incentive to find energy savings and should have already found all available energy saving options on their sites. In fact, they found over $735 million of additional savings per annum. This reflects a number of issues, including:

- Energy users often do not have the in-house expertise to fully optimise their energy use patterns, or even the expertise work closely with engage energy efficiency specialists that can help them find energy efficiency opportunities.
- Senior staff often have incentives that lead them to focus on production levels, and market share over profit, with the result that they give efficiency a low priority

The carbon tax and transitional incentives should make energy consumers put a higher priority on energy savings. Program like the EEO that engage, support and mandate large energy users to improve their energy management will have a critical role.

Commercial and Industrial (C&I) Consumers

C&I energy users have substantial opportunities for DSP, but they find it hard to take up DSP on their own and there has been limited DSP from the C&I sector to date. DSP facilitators and aggregators could quickly unlock the potential for DSP in the C&I sector.

C&I consumers have a good potential for DSP with support from a facilitator because:

- Individual C&I sites often have large opportunities to reduce their overall peak demand, and in some cases make time-of-use responses. The size of these opportunities:
    - Generally won't justify in-house experts to identify DPS opportunities and monitor energy prices
    - Generally will justify the technology and staffing costs for remote management by a third party
- Individual C&I sites may not want to take on the risk of selling DSP services to the NEM (e.g. guaranteeing a load reduction on a certain day), but could sell their DSP services to a third party that pools many DSP opportunities to sell a guaranteed DSP service to the NEM (e.g. peak demand reduction).
- Although they receive fairly imperfect price signals for energy consumption, the size of DSP opportunities is large enough to be able to monitor and commoditise.

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Households and SMEs

Households and SMEs are likely to have much smaller opportunities for DSP than C&I consumers, both individually and collectively. Households and SMEs can certainly undertake energy efficiency and even some forms of distributed generation (e.g. solar PV), but it much harder to fully optimise energy use patterns because:

- Electricity pricing for households is the least reflective of the costs of supply
- Although it makes sense for households and SMEs to have some basic understanding about energy use, the transaction costs for households to develop the skills to optimise their energy use exceeds the benefits.
- Landlords have very little reason to upgrade the efficiency of homes and SME areas
- Currently, the vast majority of domestic properties are not well-designed to support shifting of load away from peak load times.

Third parties can overcome skill gaps to find opportunities for DSP at households and SMEs, particularly in energy efficiency. Third parties can even roll out generic time-of-use DSP solutions across regions, such as cycling of air conditioning units. However, the cost of fully optimising energy use, both spatially and temporally, is much higher per MW and MWh in households and SMEs than it is in the C&I sector, because:

- The DSP opportunities at individual sites are smaller
- Unlocking DSP will require both extensive social engagement (e.g. changing norms) and site-specific engagement.

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Section 2. Barriers and Policies for third parties

Section one in this submission highlights that energy consumers are not able to make genuine 'choices' to optimise their energy use on their own, because they:

- Do not receive perfect price signals
- Lack critical information and skills to optimise their energy consumption; and
- Already rely on a range of agents, including distribution businesses, to make decisions on their behalf.
- Cannot coordinate DSP activities with other parties to maximise their benefits.

Third parties that facilitate and aggregate demand-side actions can play a critical role in optimising the balance of supply and demand in the energy market. For example, a company could offer to locate a number of energy consumers in an area where there are constraints on the electricity network, and reduce their peak demand in a way that alleviates the need to invest in augmenting the network.

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2.1 Price signals - capturing the benefits of DSP

DSP activities can have substantial direct and spill-over benefits that include:

Benefit	Parties that receive benefit
Reduced electricity consumption	Consumer
Reduced peak demand that reduces network investment	Theoretically, network businesses and all energy users. If network businesses had the right incentives, reduced peak demand would reduce expenditure on infrastructure, which would reduce energy costs for all energy users and improve network businesses profit margins.
Ancilliary services reduces network investment	Distribution businesses and all energy users
Reserve capacity, network stability and supply security	All energy users
Hedging of energy supply	Retailers and all energy users. If retailers can incorporate DSP actions into their hedging strategy it could significantly reduce hedging costs, reducing retail electricity prices.

The parties undertaking DSP actions are currently unable to capture the full benefits of DSP. There are a number of reasons for this:

- The benefits of DSP are split between various parties, so the NEM needs structures to share the benefits appropriately.
- As discussed in Section 1.2, energy prices do not reflect the full cost of energy use the specific time and location of use. As such, energy prices are unable, on their own, to ensure that the benefits of DSP are shared appropriately.
- Unless DSP services are provided in a commoditised and reliable way, network businesses will be unable to fully consider DSP in their network planning and retailers will be unable to fully consider DSP in their hedging arrangements. Third parties can address this issue.
- Unless the parties engaging in DSP services can sell their services at a fair price to retailers and distributors.
- Unless there is a pool that allows parties undertaking DSP to sell their services for a fair price, they will be unable to capture the benefit of those services.
- Unless network businesses interests and actions are aligned with energy consumers' interests, energy consumers will not benefit from reduced peak demand.
- Unless network businesses interests and actions are aligned with generators and DSP third-party interests, they will hinder, rather than support the process.

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The Energy Efficiency Council recommends that the NEM is adjusted to ensure that third parties can capture the benefits of DSP across a range of parties. The following sections discuss:

- Ensuring Portability
- Establishing an appropriate pool pricing system
- Stability for DSP service providers
- Setting up systems for third parties to receive payments for the benefits that they deliver in situations where bilateral contracts would be difficult to establish. In particular, the Energy Efficiency Council strongly supports the establishment of a national Energy Savings Initiative.
- Aligning network businesses interests and actions with energy consumers' interests. This is discussed in Section 2.2

Portability

DSP services can provide benefits to both network providers and retailers, and so DSP contracts need to be structured in a way that allows both of these benefits to be commoditised. Demand-side service contracts need to be established that allow:

- The DSP provider to sell their service to their network company (peak load reduction, frequency control etc.). As discuss later, there would need to be appropriate rules in place to enable energy consumers and DSP providers to get fair prices from retailing DSP services to network companies, given that network companies are regional monopolies.
- The DSP provider to sell their services to any retailer that is willing to purchase the DSP service, rather than just the retailer supplying the energy consumer. This will enable competition to set appropriate prices for DSP services, and ensure that retail churn does not affect the value of long-term DSP contracts.

Recommendations

DSP contracts need to be structured in a way that:

- Addresses the monopoly structure of network companies; and
- Benefits from competition in the retail market

Payment for DSP services in a pool

DSP services can be activated and switched off much faster than centralised generation, but are also much more sensitive to price than centralised generation. This has significant implications for the way that DSP services are sold in a pool. For example, centralised generation is well suited to 30-minute pricing increments, whereas DSP could both respond, and needs, much more fine-grained pricing.

This issue has been understood for some time, a several options have been canvassed over the years, such as five-minute pricing intervals and the Parer report recommendation in 2001 for 'pay-as-bid' for DSP bidding. However, there has been no progress to date. This is entirely unacceptable.

Recommendations

The AEMC must develop and implement a firm recommendation to provide appropriate prices for DSP services in a pool. The AEMC should consider a number of options, including

- Pay-as-bid pricing, which is now in operation in New Zealand
- Five-minute pricing, which is more than technologically feasible

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Stability for DSP investments

Unlocking the potential for DSP requires investment in intellectual property, labour and capital (e.g. remote load-shedding devices). Australia will only be able to unlock a fraction of the potential for DSP if it limits investments in DSP to activities that pay back within 12 months. However, many demand-side projects in Australia have been short-term 'trials' that last less than year, significantly curtailing the ability to invest in DSP. In contrast, the NEM has established a framework that provides stability for generation assets that take more than two decades to recover the initial investment.

The NEM must provide an environment that gives certainty for DSP investments with payback periods of several years.

Recommendations

The structures for encouraging DSP must provide long-term certainty for investors, rather than further short-term 'trials'

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2.2 Regulating network companies

Distribution businesses are effectively monopoly 'agents' for energy consumers, generators and other market participants. Regulatory problems mean that there are principal-agent problems, and distribution businesses 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 network businesses' interests and actions align with energy consumers' interests. These are:

- Ensuring that network businesses have the right incentives to undertake DSP
- Opening up the market for DSP to competition, so that other parties can capture the benefit of DSP if network businesses are not willing or able to undertake DSP
- 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 distributors 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 [distributors] 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 network businesses have to over-invest in network augmentation.

Furthermore, the historical focus of network businesses 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 they 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 network businesses have made some effort to improve their DSP skills (particularly network businesses in Queensland), 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 distributors 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 vicious cycle where distribution businesses 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

- Examine whether network businesses now have appropriate incentives to undertake DSP where it reduces network augmentation, in the light of the clear evidence that network businesses have a strong incentive to over-invest in grid augmentation. As part of this process, it makes sense to ask network businesses what incentives would encourage them to take a more proactive approach to invest in DSP.
- Take a strong regulatory approach to open up the market for DSP that reduces network investment to competition. This includes a national Energy Savings Initiative to provide a general incentive for DSP, and a more specific mechanism to address peak demand.

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Regulations

Network companies 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"[2]

However, regulatory oversight of distributors has been weak, and the Australian Energy Regulator (AER) has recently publicly stated that they do not have sufficient power to regulate network companies effectively. The combination of distorted incentives and weak regulation means that the vast majority of distribution businesses have seriously underinvested in DSP. Furthermore, some network businesses exploit 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:

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

[2] 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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Recommendations

- Some form of obligation on network companies that reduces peak demand in ways that defers network augmentation. A number of options should be considered, including a mandatory requirement for network companies to purchase a certain quantity of DSP from third-parties or a target on distributors to either:
    - Reduce peak demand in a way that collectively reduces network augmentation in the NEM by $1 billion a year. Individual distributors would need to have specific targets that contribute to the target; or
    - Invest the equivalent of 10 per cent of their cap-ex expenditure on DSP
- Harmonise existing state energy efficiency schemes into a single national Energy Saving Initiative (ESI) to drive general demand reduction. The Council recommends that retailers should be obligated parties, as competition between retailers will encourage ESI targets to be met more cost-effectively.
- Improve regulatory oversight of distribution businesses, including:
    - Requiring 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 up for re-assessment

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2.3 Competition

Network businesses are natural monopolies in relation to network infrastructure provision. However, they are not natural monopolies in relation to DSP that can defer investment in network infrastructure. It is a fundamental principle of Australian policy that, in the absence of a natural monopoly situation, competition should be encouraged.

A competitive market requires:

- The ability for third-parties to secure funds for DSP services that offset network investment
- The ability for third-parties to sell energy-efficiency certificates under an ESI scheme
- The ability for third parties to access appropriate data. Third parties (e.g. ESCOs) often find it difficult to access their clients energy use data, even with permission from their clients. There are no regulations on prices or minimum timeframes for data owners to provide data. In addition, even though multiple parties could invest in DSP to reduce spending on network infrastructure, currently only distributors have access to the high-quality data needed to find opportunities for DSP.

Recommendations

There are three components to encouraging competition.

- Separate DSP contracts from retail and distribution
- Use a white-certificate scheme for a national Energy Saving Initiative, as this allows companies other than retailers to sell DSP services on an open market.
- Regulate time-frames and costs for energy consumers and third parties (with consumers' permission) to access data on energy consumers demand patterns
- Require publications of annual maps of network constraints and opportunities for DSP that could offset network augmentation.

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Section 3. Barriers and Policies for 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 distribution businesses that are given monopoly powers 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 frequently 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 for the AEMC:

- Standard national grid connection rules that include:
  - A maximum of three months for a connection study
  - A method for determining the cost of connection studies.
  - A method for determining the cost of connection and benefits from network services
- 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.
- Establishing a distributed generation ombudsman in the Australian Energy Regulator. The ombudsman would ensure adherence with the standard connection process and enforce rules about who pays those costs of any upgrades to the grid.

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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

- A 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 buildings to have access to competitors, which limits the ability for cogenerators to have a secure market for their power.

Recommendations

- Rules be amended to allow cogenerators to sell electricity to energy users at appropriate rates.
- Virtual private wire rules be developed 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.
- Rules be amended to allow cogenerators to sell directly to tenants at some site as regulated monopolies.

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

- Investing in the backbone gas supply network
- Clear rules about who pays for minor expansions of the gas network
- 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.
- 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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Section 4: Responses to Issues Paper Questions

1. **Chapter 3 outlines our approach to identifying "market and regulatory arrangements that enable the participation of both supply and demand side options in achieving an economically efficient demand/supply balance in the electricity market." Do you agree with our approach?**

The Energy Efficiency Council agrees with the broad approach of identifying the market and regulatory arrangements that need to be in place to drive DSP and the barriers to DSP.

However, the Council strongly recommends that the AEMC focus its efforts on barriers to DSP facilitators and aggregators. The National Electricity Market is not a simple, natural market. It includes network infrastructure, regulated monopolies and barriers to the types of intermediaries that are critical in reducing transaction costs in the market. In this context, placing the onus on energy consumers to optimise their level of DSP without any support from facilitators and aggregators would be preposterous.

2. **How should the benefits of DSP be measured? Can they be accurately quantified?**

There are some clear benefits from DSP that can be measured and quantified, which include:

Benefit	Parties that receive benefit
Reduced electricity consumption	Consumer
Reduced peak demand that reduces network investment	Theoretically, network businesses and all energy users. If network businesses had the right incentives, reduced peak demand would reduce expenditure on infrastructure, which would reduce all energy users energy bills and improve network businesses profit margins.
Ancilliary services reduces network investment	Distribution businesses and all energy users
Reserve capacity, network stability and supply security	All energy users
Hedging of energy supply	Retailers and all energy users. If retailers can incorporate DSP actions into their hedging strategy it could significantly reduce their costs on hedging, reducing retail electricity prices.

As a result of these splits, the parties undertaking DSP actions are currently unable to capture the full benefits of DSP.

Each one of these benefits needs to be measured using a different measure (e.g. $ per MW of peak demand reduced, $ per MWh saved, MVA etc.). The metric that can be used to summarise these multiple benefits to the whole network is the financial savings.

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3. **What are appropriate discount rates to apply to DSP investments for the various parties acrossthe supply chain?**

No comment at this time.

4. **Are there other issues which we should consider in our assessment process and criteria?**

No comment at this time.

5. **What are considered the drivers behind why consumers may choose to change their electricity consumption patterns? Please provide examples or evidence where appropriate.**

This question is addressed in detail in Section 1 of this submission. In summary:

- There are multiple drivers that affect energy use, including demand for services, technology, information and the cost of electricity.
- The specific drivers that could encourage consumers to take up DSP opportunities vary between sectors. In households, the cost of electricity and social factors will be a key motivator for DSP. In commercial buildings the cost of electricity and tenant demand will be critical for DSP. In industry the cost of electricity will be the key driver.
- However, without economies of scale, the efforts for all but the largest energy consumers to identify the best DSP options will outweigh the benefits of fully optimised DSP options.

6. **Chapter 4 lists some plausible DSP options that are currently used or could be used by consumers. Are there any other plausible DSP options currently used by consumers that have not been identified? Please provide description of measures and examples, where available.**

The examples of DSP outlined in the Box 4.1 in the Issues Paper is a reasonable high-level summary of DSP options, specifically:

- Energy conservation
- Energy efficiency
- Peak demand shifting
- Fuel substitution
- Generation of own energy
- Selling energy or load back to the market, including services like frequency control.

Two key options missed are:

- 'Peak load shedding', which is sufficiently different from energy conservation and peak demand shifting to warrant its own category.
- Power factor correction

There are, of course, many more detailed options within these categroiess. A key point here is that the benefits of multiple parties undertaking coordinated DSP are far larger than uncoordinated DSP, which makes the role of facilitators and aggregators (e.g. distribution businesses, retailers, ESCOs) critical. For example, aggregating peak load shedding and distributed generation in a region across multiple users to guarantee a maximum peak load. Aggregation can deliver DSP that has 'emergent' properties, in other words the coordination of DSP at multiple sites can deliver outcomes that are more than the sum of the outcomes of those sites undertaking DSP without coordination. Clearly, energy consumers are unable to undertake coordinated DSP without an intermediary of some sort.

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7. **Are there any DSP options that are currently available to consumers, but are not commonly used? If so, what are they, and why are they not commonly used (i.e. what are the barriers to their uptake)? Please provide examples and evidence if available.**

Virtually every category of DSP listed in Box 4.1 in the issues paper, and aggregated DSP, already occur, but at far lower levels than would be possible if the barriers to DSP were addressed.

8. **Are there other DSP options that are not currently available to consumers, but could be available if currently available technologies, processes or information were employed (or employed more effectively) in the electricity (or a related) market?**

See response to Question 7.

9. **What are considered the relevant market conditions to facilitate and promote consumer take up of cost effective DSP?**

For consumers to take up optimal levels of DSP without assistance they would require conditions that could be substantially improved, but will never completely exist, including:

- Completely cost-reflective pricing for electricity
- Access to technologies like energy efficient air conditioners and real-time price monitoring
- Sufficient information on DSP opportunities and time / capacity to process the information
- Ability to coordinate their DSP opportunities with other energy consumers

10. **Are there any specific market conditions which may need to be in place to enable third parties to facilitate consumer decision making and capture the value of flexible demand? Please provide examples and evidence as appropriate.**

This question is answered in detail in Section 3 of this submission. In summary, third parties can help facilitate and aggregate energy efficiency under the following conditions:

- The parties undertaking DSP actions must be able to capture a substantial proportion of the benefits of DSP. Energy prices fail to give energy consumers price signals that reflect the time, location and peakiness of their use, which means that there needs to be clear price signals for DSP. In particular, distributed generation proponents need to receive payments for any network benefits.
- Parties undertaking DSP must be able to sell their services as a commodity that is separate from retail and network contracts, they will be unable to capture the multiple benefits of DSP to multiple parties.
- Parties undertaking DSP must be able to sell their services in a pool using a system that recognises the nature of DSP services
- Network businesses' interests and actions need to be aligned with energy consumers' interests. Currently, even if energy consumers reduce their energy consumption and peak load, network businesses still have an incentive to over-invest in network infrastructure.
- Third-parties need appropriate access to data, including regulated time-frames and costs to obtain energy consumers' data (with consumers' permission) and annual maps of network constraints and opportunities for DSP

In addition to these generic conditions, third parties need additional conditions to facilitate distributed generation. These are set out in the response to question 11.

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11. What market conditions (technologies, processes, tariff structures, information etc) are needed, that are not currently employed in the electricity market, to make other DSP options available to consumers?

Section 3 of the Energy Efficiency Council submission answers this question in detail. In summary, the following is required to drive DSP:

- Appropriate prices for DSP services in a pool, through a mechanism such as pay-as-bid pricing or five minute pricing
- The structures for encouraging DSP must provide long-term certainty for investors, rather than further short-term 'trials'
- Ensuring that network businesses have appropriate incentives to undertake DSP where it reduces network augmentation, in the light of the clear evidence that network businesses have a strong incentive to over-invest in grid augmentation
    - Some form of obligation on network companies that reduces peak demand in ways that defers network augmentation. A number of options should be considered, including a mandatory requirement for network companies to purchase a certain quantity of DSP from third-parties or a target on distributors to reduce peak demand or invest in DSP.
- A single national Energy Saving Initiative (ESI) to drive general demand reduction, comprising an energy efficiency obligation placed on electricity retailers, as recommended by the Prime Minister's Task Group on Energy Efficiency , which should be developed by harmonising existing state-based schemes
- Improve regulatory oversight of distribution businesses, including:
    - Requiring 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 up for re-assessment
- Encouraging competition in DSP services by
    - Separate DSP contracts from retail and distribution
    - Use a white-certificate scheme for a national Energy Saving Initiative, as this allows companies other than retailers to sell DSP services on an open market.
    - Regulate time-frames and costs for energy consumers and third parties (with consumers' permission) to access data on energy consumers demand patterns
    - Require publications of annual maps of network constraints and opportunities for DSP that could offset network augmentation.

There are also specific conditions that are required for distributed generation, which include:

- Standard national grid connection rules that include:
    - A maximum of three months for a connection study
    - A method for determining the cost of connection studies.
    - A method for determining the cost of connection and benefits from network services
- 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.
- Establishing a distributed generation ombudsman in the Australian Energy Regulator. The ombudsman would ensure adherence with the standard connection process and enforce rules about who pays those costs of any upgrades to the grid.

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- A transparent system for paying distributed generation owners for network benefits
- Distributed generation owners be able to sell electricity to energy users directly at appropriate rates
- Distributed generation owners need, in some locations, to be able to sell electricity to energy users as regulated monopolies.
- Distributed generation owners need to be able to use the public electricity network as a 'virtual private wire' with cost-reflective distribution costs
- A sound framework for gas infrastructure
- Payments to reflect first-mover disadvantage, given the range of barriers to distributed generation.

12. Do you consider retail tariffs currently reflect the costs to a retailer of supplying consumers with electricity?

The averaging pricing structure created by regulated retail tariffs mutes the efficient price signal that would be attained through cost reflective pricing and inhibits the uptake of DSP. The charges that energy consumers receive are not reflective of the location, time or pattern of energy use, with the result that energy consumers are not receiving cost-reflective energy pricing. As discussed in section 1.1 of the Energy Efficiency Council submission, electricity prices are smeared across time, space and users and full cost reflective pricing is unlikely to be possible.

13. Are any changes needed to retail price regulation to facilitate and promote take up of DSP?

Although the Energy Efficiency Council notes the importance of prices reflecting costs, full cost-reflective pricing is unlikely to be possible for the vast majority of energy users.

14. Do the charges to retailers for use of transmission networks reflect the value of that use?

No comment.

15. Do the charges to retailers for use of distribution networks reflect the value of that use?

No comment.

16. Do all consumer groups, including vulnerable consumers benefit from having cost reflective prices in place? If not, are any special provisions required to protect certain classes of consumers?

Although the Council supports the principle of cost-reflective pricing, we note that many consumers do not have the information, skills or economies of scale to respond effectively to fully cost-reflective pricing that considers the precise time and location of energy use.

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17. **To what extent do consumers understand the how they can reduce their electricity bill? What information do consumers need in order to increase their understanding of how they can reduce and manage their electricity consumption and hence bills?**

Consumer understanding of the options for reducing their electricity bills is extremely limited. There is an extensive literature on behaviour change in households which suggests that they need specific information on a limited number of priority actions that they can undertake rather than extremely complex or generic information.

The Council recommends that consumers need four forms of information:

i. Information that helps to foster a 'culture' of energy efficiency

ii. Time of use billing that displays the rates for peak, shoulder and off-peak use and user consumption during peak, shoulder and off-peak times

iii. Information on a small number of discreet actions that consumers can undertake without support from an energy efficiency expert, such as installing high-efficiency light bulbs, reducing heat loss and installing insulation and solar hot water.

iv. Information on how to engage third-parties to optimise their energy use in more complex ways. This includes information on home or business energy efficiency experts and options for contracts that offer lower energy bills in exchange for peak demand reduction (e.g. air conditioner cycling)

18. **What issues are associated with provision of existing information in the market? Are there arrangements that could improve delivery of such information? If so, how and by whom?**

No comment

19. **Could better information be provided to consumers regarding the actual consumption of individual appliances and pieces of equipment? If so, what information could be provided and in what form?**

No commentYes. Such information can now be provided through devices such as in-house energy displays which can operate without also requiring the installation of a smart meter. AEMC should consider how the availability of such devices to consumers can be improved.

20. **Are retailer and distributor business models supportive of DSP?**

No. Distribution businesses, in particular, do not have a strong incentive to engage in DSP. In fact, DSP can reduce the case for investment in infrastructure, reducing income for distribution businesses. This is discussed in section 3.2 of the Energy Efficiency Council submission.

21. **What incentives are likely to encourage research and development of other parties to promote efficient DSP?**

The Energy Efficiency Council has addressed this issue in detail in Section 3.1 and 3.2. Specifically, the Council recommends:

- A bidding system for DSP
- An obligation on network businesses to invest in DSP, and a requirement that they take reasonable offers from third-parties for DSP services.
- A national Energy Savings Initiative

22. **Are there any regulatory, cultural or organisational barriers that affect take up of DSP opportunities?**

There are substantial cultural and organisation barriers that prevent network businesses from investing in DSP. These barriers are substantial, and warrant mandatory requirements on network businesses to invest in DSP.

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23. What form of commercial contracts/clauses are required for facilitating and promoting efficient DSP?

DSP contracts need to be separated from retail and distribution contracts, so that DSP providers can sell the services to retailers and distributors

24. Are there specific issues associated with investment in infrastructure needed for consumers to take up DSP opportunities?

There are substantial issues in relation to investment in infrastructure. These are addressed in detail in Section 3.2 of this submission. This section should be read in whole, but in summary the Energy Efficiency Council recommends:

- Some form of obligation on network companies that reduces peak demand in ways that defers network augmentation. A number of options should be considered, including a mandatory requirement for network companies to purchase a certain quantity of DSP from third-parties or a target on distributors to either:
    - Reduce peak demand in a way that collectively reduces network augmentation in the NEM by $1 billion a year. Individual distributors would need to have specific targets that contribute to the target; or
    - Invest the equivalent of 10 per cent of their cap-ex expenditure on DSP
- Harmonise existing state energy efficiency schemes into a single national Energy Saving Initiative (ESI) to drive general demand reduction. The Council recommends that retailers should be obligated parties, as competition between retailers will encourage ESI targets to be met more cost-effectively.
- Improve regulatory oversight of distribution businesses, including:
    - Requiring 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 up for re-assessment

25. Do you consider that the issue of split or misaligned incentives has prevented efficient investment in DSP from taking place?

Yes, in particular the misaligned incentives between energy consumers (the principals) and network businesses (the agents), where network businesses may not be investing optimally.

26. What are potential measures for addressing any issues associated with split or misaligned incentives?

See the answer to question 24

27. Are there specific issues concerning ease of access to capital for consumers and other parties?

Access to capital can be an issue for consumers and other parties. The Council notes that Low Carbon Australia and the Clean Energy Finance Corporation may be able to address these barriers.

28. What are the significant energy market challenges in optimising the value of technology and system capability to facilitate an efficient level of DSP?

This broad question is addressed throughout this submission.

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29. **Do current technology, metering and control devices support DSP? If not, why not, and what are considered some of the issues?**

Technology is currently available to unleash large quantities of DSP. The Council supports the development and implementation of smart-grid technology, but note that DSP in commercial and industrial sectors does not need to wait for smart-grid technology.

30. **How can issues relating to weak and/or split incentives be addressed to ensure that the benefits of smart grid technologies are aligned and felt across the electricity supply chain, including by consumers?**

The majority of this is addressed under question 24, but there are additional issues in relation to access to data.

31. **How can pricing signals/tariff arrangements be made complementary with smart grid technologies to facilitate efficient DSP in the NEM?**

No comment.

32. **In maximising the value of technologies, such as smart grids for DSP, what are the issues relating to consumer protection and privacy?**

No comment.

33. **To what extent do parties have appropriate incentives to put in place the systems, technologies, information flows etc that facilitate efficient DSP?**

This issue is addressed extensively elsewhere. See the answers to questions 11 and 24.

34. **Are there aspects of the NEL or the Rules which prevent parties taking actions that would otherwise allow for more efficient levels of DSP?**

This issue is addressed extensively elsewhere. See the answers to questions 11 and 24.

35. **Are there market failures which mean regulation is needed in some areas to ensure appropriate market conditions are in place?**

This issue is addressed extensively elsewhere. See the answers to questions 11 and 24.

36. **What energy efficiency policies and schemes should be considered as part of this Review, i.e. as impacting on, or seeking to integrate with the NEM?**

There are numerous schemes that impact on DSP, including building and appliance standards.

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37. To what extent can energy efficiency policies and schemes be adopted as options for enhancing the efficiency of DSP in the NEM? What are the strengths and limitations of energy efficiency policies as a DSP option compared to other options?

The Energy Efficiency Council notes that over the last decade 'tweaks' to the NEM have failed to unlock the DSP potential that is so evidently under-utilised in the NEM. The time for further tweaks has passed – the market clearly needs the certainty of DSP schemes. While energy efficiency schemes may be more blunt than a theoretically perfect regulatory regime, it is time to accept that price signals in the NEM are not perfect, the market participants are not perfect and a second-best policy solution is the best policy solution.

The Energy Efficiency Council recommends:

- Some form of obligation on network companies that reduces peak demand in ways that defers network augmentation. A number of options should be considered, including a mandatory requirement for network companies to purchase a certain quantity of DSP from third-parties or a target on distributors to either:
    a. Reduce peak demand in a way that collectively reduces network augmentation in the NEM by $1 billion a year. Individual distributors would need to have specific targets that contribute to the target; or
    b. Invest the equivalent of 10 per cent of their cap-ex expenditure on DSP
- Harmonising existing state energy efficiency schemes into a single national Energy Saving Initiative (ESI) to drive general demand reduction. The Council recommends that retailers should be obligated parties, as competition between retailers will encourage ESI targets to be met more cost-effectively.

38. To what extent do existing retailer obligation schemes facilitate efficient choices by consumers in their electricity use? Are there aspects of those schemes that facilitate efficient consumption choices more than others? If so, please explain.

The Energy Efficiency Council strongly supports the introduction of a retailer obligation scheme. These types of scheme appear to have been the only tools to date that have been effective at driving substantial uptake of DSP. The Council will provide supplementary information on retailer obligation schemes to the AEMC at a later date.

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