Ms Sophie Dunstone
Committee Secretary
Senate Committee on Electricity Prices
Parliament House
Canberra ACT 2600
Email: electricityprices.sen@aph.gov.au

14 September 2012

Dear Ms Dunstone

The Select Committee on Electricity Prices has requested submissions on the key causes of electricity price rises and options to reduce electricity bills for households and businesses. This submission provides the Energy Efficiency Council's initial views on these issues. The Council is also currently commissioning work with other organisations on the key options to tackle rising electricity price, and will provide this information to the Committee as soon as it is complete.

The Energy Efficiency Council is the peak body for energy efficiency, demand response and cogeneration, and brings together Australia's top experts in these subjects to support the development of policy and programs.

Electricity bills in Australia are rising rapidly. Much of these price rises were avoidable if the right steps had been taken several years ago, and if urgent action is not taken electricity bills will continue to rise. However, there are substantial opportunities to slow the growth of electricity prices and actually reduce electricity bills.

There are a number of factors driving up electricity prices in the National Electricity Market (NEM) that covers the East coast of Australia. The most significant is expenditure on the electricity network (poles and wires), which accounts for over 50 per cent of increases in electricity prices in most parts of the NEM. The Council maintains that much of this investment was avoidable, and was driven by:

- Poorly managed rapid growth in peak demand; and
- The lack of incentives and regulatory oversight that would encourage and compel network companies to find the most cost-effective method to reduce or meet peak.

The Energy Efficiency Council encourages the Senate Committee to use its Terms of Reference and focus beyond just electricity prices to encompass the more critical issue of electricity bills. Electricity bills include a price per unit of electricity ('electricity prices'), the number of units of electricity consumed and, in most cases, a fixed charge and/or a 'maximum demand' charge.

Ultimately it is electricity bills, rather than electricity prices, that affect energy affordability for households and businesses. Many households and businesses have managed to reduce their electricity bills over recent years while electricity prices have been rising by:

- Improving their energy efficiency (otherwise known as energy productivity), so that they get the same or better services for less energy
- Shifting their energy use away from high price 'peak times' towards lower price off-peak times. This both reduces energy bills and system-wide peak demand, which can reduce electricity prices for all energy users.

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There is a sophisticated relationship between individual energy users' behaviour, individual bills and system-wide energy demand patterns which impact electricity prices. The Senate Committee will deliver the largest benefits if it seeks policies that would:

- Improve energy efficiency so that households and businesses can achieve more outcomes for less electricity; and
- Reduce peak demand to reduce the price of electricity, including incentives and requirements for network companies to tackle peak demand

The Energy Efficiency Council recommends eight policy priorities for the next two years:

1. Adopt the Australian Energy Market Commission's (AEMC) recommendation to allow large consumers to sell reductions in electricity demand into the wholesale electricity market. This would reduce peak demand and growth in electricity prices.
2. Improve the incentives and regulations for electricity network companies to ensure that they deliver their services more cost effectively, which would reduce over-investment driven by both peak and other factors.
3. Address the specific barriers that reduce investment in projects that reduce peak demand, and hence the need to invest in the network, by setting a target for network companies to undertake a minimum level of peak-reduction work, boosting competition by strengthening the ability of third-parties to receive payment when they defer network augmentation and adjusting the incentives for network companies, including decoupling profits from electricity sales.
4. Establish a national Energy Saving Initiative (ESI) to help homes and businesses reduce their energy demand. The ESI would reduce red-tape by replacing four existing and proposed state schemes in NSW, Victoria, South Australia and ACT.
5. Maintain critical programs that help homes and businesses improve their efficiency, such as the Clean Technology Investment Program, Energy Efficiency Opportunities program and Commercial Building Disclosure program.
6. Address the barriers to distributed generation, including access and cost sharing arrangements for electrical and gas connection.
7. Improve the efficiency of government owned and occupied buildings, which will reduce government electricity costs and develop the energy efficiency industry
8. Strengthen the role of consumers and experts in developing and operating the NEM.

Australians deserve energy markets that serve their interests. The Energy Efficiency Council looks forward to working with the Senate Committee on Electricity Prices to ensure that this occurs.

Yours sincerely

Rob Murray-Leach

Chief Executive Officer

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1. An overview of electricity costs

Understanding electricity bills requires a focus on the needs of electricity consumers. Ultimately, households and businesses consume electricity to receive a 'service'. Households use electricity in equipment to deliver services like lighting, heating, cooling, cooking and entertainment. Businesses use electricity in equipment to deliver services like lighting, heating, information technology and manufacturing.

The more efficiently that a household or business uses electricity, the more 'service' they get for the amount of electricity they consume. For example, switching from an incandescent lightbulb to an LED light can reduce electricity consumption by 80 percent while delivering better quality light. Similarly, adjusting a building's structure so it is lit with more natural light will improve the quality of light while reducing electricity use.

Historically, Australia has had low energy prices and households and businesses did not focus on efficiency. As a result, most Australian homes and businesses are much less efficient than their equivalents in Europe and the US. Rising energy prices means that Australian homes and businesses are now at a disadvantage compared to their overseas equivalents. However, this means that Australian homes and businesses have significant opportunities to improve their efficiency and lower their bills.

Therefore, the Energy Efficiency Council strongly recommends an urgent focus on improving the efficiency of the economy. This includes:

- Establishing a national Energy Saving Initiative (ESI) to help homes and businesses reduce their energy demand. This would reduce red-tape by replacing four state an territory schemes that already exist or are under development.
- Maintaining critical programs that help homes and businesses improve their efficiency, like the Clean Technology Investment Program; and
- Improving the efficiency of government owned and occupied buildings.

However, electricity bills are not just determined by the amount of electricity that is consumed - they are also affected by the price of electricity and this is affected by a several factors, particularly 'peak-demand'. Peakier demand increases electricity costs because:

- The network (poles and wires) has been built to meet the 'peak demand' at various locations in the network, and so as peak demand increases the cost of building and operating the network increases. If peak demand is much higher than average demand the cost of the network has to be split between fewer units of energy.
- The more variable that demand is, the higher the cost of generation. As with networks, the amount of generation that needs to be built is determined by peak demand, not average demand. As demand becomes more variable, supply shifts from forms of generation that are cheaper to run (such as coal and closed-cycle gas) to forms of generation that are cheaper to build but expensive to run (e.g. open-cycle gas).

Peak demand has grown rapidly over the past decade in Australia, much faster than average demand, and this is one of the main factors that has driven up electricity prices. The next section examines the causes of rising electricity prices.

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2. Peak demand and electricity price rises

The main factor driving up energy prices over the past five years has been expenditure on the electricity network (distribution and transmission). While the carbon price increased electricity prices by around ten percent in 2012, in most states and territories increased network prices had over three times as much impact on prices as the carbon price over the last five years. Network costs generally account for over 50 per cent of price rises. This is consistent with work by Professor Ross Garnaut from 2010 that found that network costs accounted for 68 per cent of recent price rises (see Figure 1).

Network charges are now the largest component of electricity prices, accounting for 42 per of electricity prices in 2012-13 (see Figure 2).

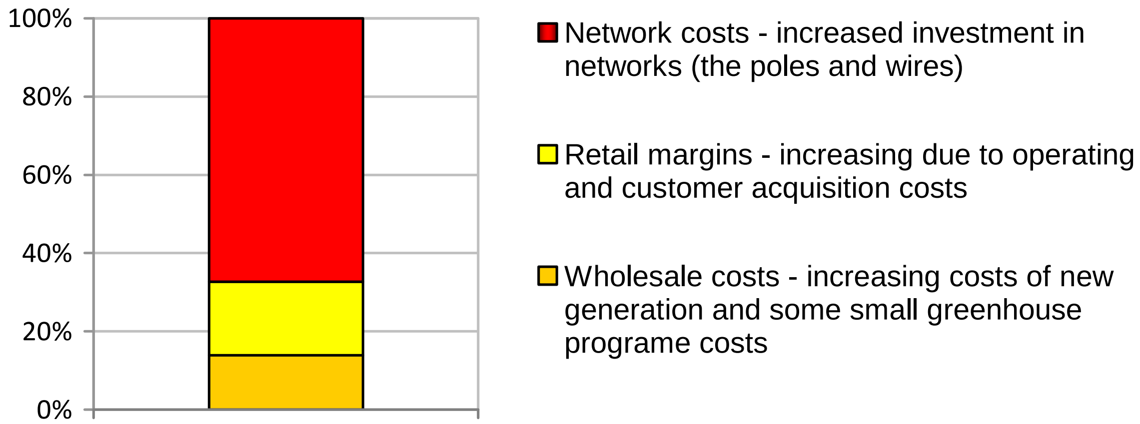

Figure 1: Contribution to electricity price rises

Source: Garnaut (2010) *Garnaut Climate Change Review Update Paper 8: Transforming the Electricity Sector*, Garnaut Climate Change Review, Melbourne.

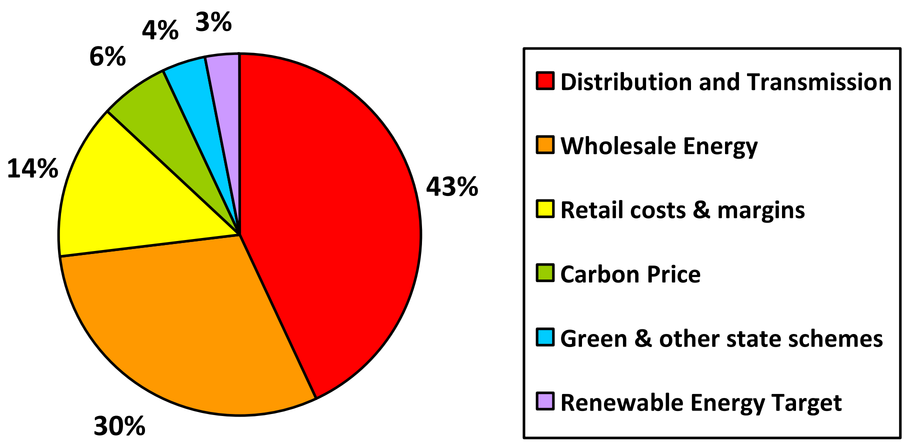

Figure 2: The main components of electricity prices 2012-13

Source: COAG Taskforce on regulatory and competition reform

Distribution and transmission costs are rising because the monopoly network companies that manage distribution and transmission are spending around $45 billion over a five year period to upgrade the network. While around a third of this expenditure is necessary to upgrade aging assets and service new suburbs, much of this expenditure was avoidable. Network expenditure was strongly driven by rising peak demand (demand on a few hot hours each year), coupled with distorted incentives for network companies to increase expenditure and regulated returns.

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Peak demand also affects the second and third largest components of electricity bills - wholesale energy (30 per cent of prices) and retail costs and margins (14 per cent of prices). Wholesale prices have been falling, in part because renewable energy and reduced electricity demand have been suppressing wholesale prices. However, rising peak demand means that wholesale prices during peak periods are substantially higher than average prices. Furthermore, retailers need to expend significant sums on hedging to deal with peak demand periods that last just a few hours a year.

Peak demand is rising much faster than overall demand. Peak demand grew by 30 per cent between 1999 and 2010, from 26 GW to 34 GW. High peak demand means that billions are being spent on network and generation infrastructure that are only needed for a few hours a year. Recent work included in the Australian Government's Draft Energy White Paper suggests that around 10 to 25 percent of total energy bills are 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. Further investment to meet peak demand growth will increase the cost per unit of electricity.

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 the cost 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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3. Why are energy demand and peak demand distorted?

A number of factors are distorting demand for electricity, particularly during peak demand periods.

Pricing distortions

Electricity consumers face very distorted energy prices and this encourages them to consume electricity in ways that increase both electricity bills and the cost of electricity. These distortions include:

- Prices that do not reflect the cost of supply at different times
- Prices that do not reflect the cost of supply at different locations
- Cross-subsidies for specific classes of consumer.

Imperfect time-of-use pricing

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 exceed $20 per kWh[1]. However, at the moment most energy consumers face a maximum 'peak' charge of around 20-30 cents per kW, which could be just 1 per cent of the cost of supply during critical peak periods in particular locations.

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 small 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 consumers 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.

Given the fact that many energy consumers are charged just a fraction of the cost of supply during critical peaks, it is unsurprising that peak demand is growing faster than would be socially optimal.

There is good evidence that improving the cost reflectivity of energy prices is one option to move consumption towards more optimal patterns. Trials have indicated that critical peak

[1] This estimate consists of $12.50 per 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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pricing is the most effective form of time-of-use pricing, potentially reducing peak demand by 30 per cent or more[2].

However, there are practical and social barriers that make it hard to rapidly introduce 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, public concerns also mean that most consumers must be allowed to voluntarily take up critical peak pricing.

The Australian Energy Market Commission (AEMC) has come to a similar conclusion in its recent draft 'Power of Choice' report, and recommends that most large- and medium-energy users should face time-of-use tariffs that reflect overall network system peak costs. However, the majority of households would not face a time-of-use tariff for some time.

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.

An alternative approach to critical peak pricing for wholesale energy is set out in Section 4.

Imperfect locational pricing

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 can vary 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.

The technical, social and practical barriers to replacing 'postage-stamp' pricing with 'site-specific' pricing means that such a shift in pricing is unlikely to be implemented within the next two decades. Furthermore, even if it were possible to introduce site-specific pricing, most small consumers would find it difficult to respond to complex site- and time-specific pricing.

However, network companies can partially correct this locational distortion by investing in location-specific projects to improve energy efficiency and reduce peak demand (e.g. air conditioning cycling or commercial demand-response) where it is cheaper than investing in poles and wires to meet peak demand. In effect, networks can correct decisions to over-consume in certain locations, which have occurred due to prices that don't reflect the cost to consume in those locations.

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

[2] 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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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 monitoring wholesale energy prices in-house and responding optimally 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 responsive energy consumers.

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. Some electricity retailers provide both excellent electricity retail services and demand-side services, but these are different types of services and not all retailers offer both services.

However, at the moment 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 network companies to respond to their energy use decisions in the way that they invest in infrastructure. Theoretically, network companies should respond to consumer

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decisions in ways that maximise benefits for consumers. It appears that this is not occurring.

Network companies should consider both peak demand and consumption when determining the cost benefits of reducing demand 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 network companiess 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, network companies do not have the skills or incentives to determine when demand reduction would be a suitable option and deliver demand-side 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 - in 2010 Professor Ross Garnaut estimated that 68 per cent of recent rises in electricity prices had come from investment in electricity transmission and distribution infrastructure[3].

However, energy consumers do not have the ability to switch to another network company if they feel that their network company is making poor investment decisions on their behalf. Network companies are monopolies and consumers are in a weak position to influence network companies' behaviour. The result for energy consumers is that, even though they are responding somewhat to energy price changes, distributors' investment decisions are not reflecting their choices. In other words, there are principal-agent problems between consumers and distributors.

The role of network companies 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 site-specific 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, network companies 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 the uncoordinated decisions of many hundreds of consumers affect network costs, the role of network companies and other intermediaries becomes even more critical.

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

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4. Selling demand-response into the wholesale market.

The AEMC has recommended that large consumers, or third parties on their behalf, be allowed to sell reductions in electricity demand into the wholesale electricity market. The Energy Efficiency Council strongly supports this recommendation as it solves multiple problems.

First, allowing energy users to sell reductions in energy demand into the market provides a time-of-use price signal to large energy consumers that encourages them to conserve energy during periods when supplying energy is expensive. Currently, very few large energy users face a price signal that reflects the true cost of supply at that time.

While large energy users currently have the option of seeking a retailer that is prepared to pass through the wholesale electricity price (which varies with time) or a critical peak price in practice few large energy have sought these options, in part because the wholesale market is relatively volatile and hedging against the risks of operating during a high-price period is complex. The main role of retailers is providing a simple price for electricity so that energy users don't have to hedge.

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 with the valuable risk management services that they currently receive from energy retailers.

Second, the price signal for consumers would be set by the generation market. In other words, consumers would only be paid to reduce their demand if it was cheaper than generation. In the short term this would increase competition in the energy market and reduce the wholesale price for electricity, reducing electricity prices for all consumers. In the long term this would reduce the need to build very expensive peaking generators and networks (see below), reducing the growth in electricity prices for all consumers.

Third, these changes would make it easier for third-parties that are experts in reducing peak demand to help consumers to optimise their energy demand patterns. Allowing consumers to sell demand-response into the market provides a clear value for this demand-response, facilitating commercial intermediaries.

Fourth if this market were established it would also enable meaningful volumes of peak reduction to be developed and sold to network companies This would help reduce expenditure on transmission and distribution infrastructure and partially address the split incentive, whereby the benefits of demand-side actions are split between several parties.

However, fully realising the benefit of demand-side actions to reduce investment in network infrastructure will require reforms to the way that network companies are regulated and incentivised, to ensure that they are motivated to undertake and procure demand-side activities. This is discussed in more detail in the next chapter.

The Council notes that, if a capactiy market was introduced into the National Electricity Market, an energy consumer could sell their demand-response into the capacity market instead of the wholesale energy market. Capacity markets appear to unlock greater volumes of peak reduction than other mechanisms but have major ramifications for generation, and any decision to introduce a capcity market requires detailed consideration.

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5. Fixing the networks

Network companies are monopolies that build and manage the electricity network. Incentives and regulatory problems mean that there are principal-agent problems, and network companies may not always act in the best interest of their clients (e.g. energy generators and consumers). We need to use three mechanisms to ensure that network companies interests and actions align with energy consumers' interests. These are:

- Ensuring that network companies have the right incentives;
- Regulating network businesses to ensure that they undertake demand-side activities or purchase them from third parties; and
- Opening up the market for demand-side activities to competition, so that other parties can capture the benefit of demand-side activities if they are more efficient than network companies, or the network companies are not willing or able to undertake demand-side activities.

Aligning the incentives for network businesses

The AEMC has concluded that network businesses currently have distorted incentives that may encourage them to build more infrastructure. These incentives including an allowed Weighted Average Cost of Capital (WACC) that may exceed the actual cost of capital. As a result, some network companies do not have incentives to be as cost-effective as possible, whether that is through general cost-efficiency or through the specific cost-saving measure of reducing demand when it is cheaper than building infrastructure to meet peak demand. These distorted incentives result in inefficient investment in infrastructure, which increases the cost of electricity.

Network businesses also face specific disincentives to invest in reducing demand when it is cheaper than augmenting the network. These include incentives to maximise energy throughput, incentives to spend on cap-ex rather than op-ex and a number of smaller distortions. The AEMC's draft Power of Choice review recommends a number of changes that would fix the smaller distortions, but does not recommend strong action to fix up the cap-ex/op-ex distortion or the incentive to maximise energy throughput.

With energy throughput, the returns that networks are allowed over a five year period are estimated at the beginning of that period. In regions like Victoria and NSW networks then collect this revenue through an estimate of how much energy (MWh) is likely to flow through their network over the five year period, and the amount of revenue require is split between those estimated units of energy (for simplicity could be considered as $/MWh). If more energy flows through the network than anticipated, the network makes a windfall profit. If less energy flows through the network than anticipated, the network makes less profit.

First, this means that networks can make windfall profits at the expense of consumers. According to the AEMC *"In the Victorian 2006-2010 regulatory control period, the AER asserted there was over recovery of revenue of $568 million (in 2010 values) above the adjusted forecast. This represents an over recovery of revenue of 8.28 per cent annual for each distribution business"*[4] In other words, network businesses made a half billion dollar windfall profit at the expense of electricity consumers in Victoria in a five year period.

Secondly, the fact that network companies' income increases if consumers use more energy is a substantial disincentive for network companies to undertake projects that reduce both peak demand and consumption (MWh).

The Council recommends fixing both of these problems by 'decoupling' network profits from energy throughput. This is standard practice in the US, and is generally done by

[4] AEMC 2012 *Draft Report: Power of choice - giving consumers options in the way they use electricity*, AEMC Sydney p 128

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adjusting the amount of income that networks get on a periodic basis so that their actual income equals their allowed revenue.

The AEMC also recognises that there are problems in the rules that make it simpler for network companies to make profits from cap-ex (capital expenditure) rather than op-ex (operational expenditure). Programs that reduce demand generally have a high op-ex component, so these rules discourage investment in projects that reduce demand. The AEMC has not recommended any changes to the rules to correct this distortion.

While the AEMC is not proposing to correct these distortions, it has recommended expanding an existing incentive scheme that encourages networks to undertake demand-side activity. This incentive, the Demand-Management and Embedded Generation Connection Incentive Scheme (DMEGCIS), would provide incentives for networks that correct for lost income (reduced electricity throughput) and would compensate or reward networks for:

- Benefits from deferred capex over multiple years
- Benefits beyond the network (e.g. reduced wholesale prices)

The Council is still assessing the adequacy of the AEMC's proposal. However, the Council would generally prefer the approach of correcting distortions, rather than compensating for them using additional incentives.

Skills, culture and minimum targets

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

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

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

The NEM now has a 15-year history of tinkering in this area, which has failed to address this issue. 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 minimum target for networks to undertake demand-side activities that reduce investment in the network. For example, while most networks could efficiently avoid 30 per cent of their peak-growth driven network investment, the Council recommends that the target be set at a more modest level of 10 per cent. This would encourage network companies to undertake a minimum level of demand-side activities, which would in turn build their skill base, allowing them to invest in a higher, more economically optimal level of demand-side activities.

Regulations

Network companies are natural monopolies, and so it is critical not only to provide them with appropriate incentives, but also to 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 peak reduction 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 network companies has been weak, and the 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 network companies have seriously underinvested in peak reduction. Furthermore, some network companies 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.

Therefore, the Energy Efficiency Council recommends increasing the power and proactivity of the AER to improve the network regulation

Competition

Network companies are natural monopolies when it comes to investing in poles and wires, but are not natural monopolies when it comes to demand-side activities. However, at the moment network companies are in a monopoly position when it comes to rewarding energy users and other parties for deferring, reducing and avoiding investment in poles and wires.

Demand-response must be opened up to competition. Ultimately, energy users are responsible for demand-response, and other parties (e.g. retailers, aggregators, network companies) are simply assisting demand-response, although this assistance is often complex and requires significant investment in intellectual property.

Opening up demand-response to competition requires demand-responders to be able to access part of the value from deferring network costs. Currently, these can only be accessed by negotiating with a monopoly network companies. Given that the demand-responder is effectively in competition with the network company, this is inappropriate.

The Council recommends that, first, network companies should be required to indicate the value of demand-reduction in various parts of the network in sufficient detail to allow investment by other parties in demand-reduction.

Second, parties wishing to sell demand-side activities that reduce network investment need to have some certainty of reward for their activities. There are number of options that could deliver this, but some level of rules and/or oversight by the AER will be essential.

Pricing

The AEMC has recently accepted that networks do not have a strong incentive to set cost-reflective tariffs, and recommends phasing in critical peak pricing that reflects network costs. The Council is still assessing this proposal, but in general supports networks being required to offer some form of critical peak price or peak-reduction rebate.

[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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Key Issues	
1. Network incentives	Networks need to have the right incentives to invest in demand-side activities when they are more cost-effective for energy users than supply-side options. This will require a. Removing the incentives for networks to over-invest in cap-ex (including distortions in the WACC) b. Decoupling profits from energy throughput c. Developing a model for networks to capture an appropriate level of system-wide benefits when they undertake energy efficiency and peak-reduction programs d. Fixing the distortions against demand-side activities, such as the treatment of demand-side investment in the regulated asset base
2. Regulatory Reset and Planning	The regulatory process for networks (e.g. RIT-D & RIT-T) needs to be transparent and effective to ensure that network investment decisions are efficient. The current system has serious flaws. To correct this, the Australian Energy Regulator needs to be given more power and resources, and needs to use those resources.
3. Skills & culture	Networks lack the skills and culture to invest in demand-side activities when they are more cost effective than supply-side options. The Council recommends that this is overcome by setting networks low targets to achieve a minimum level of deferment of network spend using demand-side activities. The target would be a minimum targets and so would be well-below the full economic potential for demand-side activities, but would be high enough to catalyse a change in culture in network companies.
4. Opening up demand-side to competition	The best way to ensure that demand-side activities are cost-effective is to open up the activity to competition. To achieve this: - Networks should be required to provide robust and timely data on upcoming network constraints and the value of deferral - Energy users, retailers and aggregators doing demand-side should be rewarded for network deferral support.
5. Price signals to consumers	As recommended by the AEMC, price signals for large and medium consumers should reflect critical peak prices for network costs.

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6. Improving energy efficiency and productivity

Improvements to the NEM are vital, but some of these changes will take some time to implement and, on their own, these reforms will not address a number of price and non-price barriers that make it hard for households and businesses to respond to rising energy prices. Measures that help households and businesses overcome these barriers will complement peak reduction programs and drive significant reductions in energy bills.

Most businesses have the opportunity to cost-effectively reduce their energy use by at least 20 per cent. Australia is one of the least energy efficient developed countries, and this puts our economy at a competitive disadvantage. Between 1973 and 1998 Australia's energy efficiency increased by just 0.7 per cent a year, compared to 1.6 per cent a year in most other developed countries.

The Council recommends a number of measures to improve energy productivity, including:

- Information and capacity-building programs like the Commercial Building Disclosure scheme and Energy Efficiency Opportunities program
- Support schemes like the Clean Technology Investment Program
- Establishing a National Energy Savings Initiative (ESI), which would both improve energy productivity and reduce red-tape by harmonising existing state scheme.
- Minimum standards for appliances and buildings
- Energy efficiency in Government Operations.

The Energy Efficiency Council strongly supports the development of an ESI as a priority. The Council welcomes the commitment from the Australian Government on 10 July 2011 that it would

> *"expedite the development of a national energy savings initiative and will examine further how such a scheme may assist households and businesses to adjust to rising energy costs".*

The Council also welcomes the statement from the Hon Greg Hunt MP on 2 December 2010 that:

> *"The Coalition believes in direct action that delivers low-cost carbon cuts. We are prepared to work with the Government to replace the three State energy efficiency schemes with a single national scheme. However, this isn't carte blanche – the scheme will have to be designed well"*

Finally, the Council welcomes the support from the Australian Greens and a number of independents for a national ESI.

There is a clear case for establishing an ESI to help households and businesses adjust to rising energy costs. Most advanced economies have in place, or are considering, schemes similar to the ESI. Energy prices are rising rapidly in Australia, and globally, because of expenditure on the network, rising fuel costs and a shift to more expensive forms of generation. However, the structure of Australia's energy market and a number of barriers make it hard for households and businesses to respond to rising energy prices.

The Government's multi-departmental Nation Energy Savings Initiative Working Group, which is investigating whether to introduce an ESI and how it should be designed, have noted that the objective for an ESI should be:

> *"to improve Australia's energy efficiency in order to help manage energy bills and improve productivity."*[6]

[6] Australian Government 2012 *Progress Report: National Energy Saving Initiative*, Australian Government, Canberra, page 33.

A well-designed ESI would achieve this objective by:

- Providing a positive price signal for demand-side activities to correct distortions in energy costs that are practically difficult to reform, such as cross-subsidisation for installing and using air conditioners.
- Enabling third-parties to help consumers undertake coordinated demand-side activities at scale. This would address the structural imbalance in the energy market which encourages supply-side activities at scale but impedes delivery of demand-side activities at scale.
- Creating an incentive for businesses to find ways to overcome well-known market failures that prevent the take up of privately cost-effective energy efficiency, including information barriers, bounded rationality and split-incentives.
- Enabling market-transformation in the supply of energy efficiency goods and services, such as high-efficiency motors.

The ESI will address these barriers, making it easier for households and businesses to respond to rising energy prices. An ESI would reduce total energy costs across the economy by reducing:

- Fuel inputs per unit of service; and
- Carbon input per unit of service; and
- Peak energy demand, noting that this should not be the primary focus of the scheme

Modelling for the Prime Ministers Task Group suggested that an ESI could reduce household energy bills by $87 to $296 a year by 2020, including $3.5 to $12 billion in deferred generation and network costs[7]. The ESI should support energy efficiency and cogeneration optionsin homes, SMEs and industry (large energy users)

[7] Department of Climate Change and Energy Efficiency 2010, *Report of the Prime Minister's Task Group on Energy Efficiency*, Department of Climate Change and Energy Efficiency, Canberra

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7. Barriers to distributed generation

There are multiple definitions of distributed generation, but it can be broadly defined as energy generation that is sited within or close to the point of demand. Distributed generation includes co-generation, tri-generation and solar PV. This submission focuses only on co-generation and tri-generation.

Unlocking the potential of distributed generation (DG) will be critical to keep electricity and energy services affordable into the future. The costs of DG are falling at the same time that fuel and electricity prices are rising, increasing the economic benefits from the uptake of DG and energy efficiency. In particular, increased penetration of cogeneration and trigeneration systems would significantly benefit energy users over the next two decades. Cogeneration and trigeneration:

- Substantially improve the efficiency of converting fuel into useful services, relative to conventional generation. Large-scale coal- and gas-fired generators are typically situated some distance from the point of energy use. As a result, there are substantial losses of energy. In a coal-fired generator, around 65 per cent or more of energy in the coal is lost as heat at the generator. A further 7 to 15 per cent of energy is then lost in transmitting and distributing the electricity that comes out of the generator, with the result that the energy user may receive just 28 per cent of the energy that was contained in the coal.

  In contrast, with cogeneration the fuel is burnt on-site, which allows most of the waste heat to be used onsite for heating and cooling. As the electricity is generated onsite, there is almost no transmission and distribution loss, and 80 per cent or more of the energy in the fuel can be used onsite as heat or electricity. Changes in technology and fuel prices mean that 'distributed generation' could offer energy users significant reductions in energy costs.
- Are highly responsive energy systems, in contrast to both large coal generators and intermittent forms of renewable energy. This means that cogeneration and trigeneration can help balance supply and demand and allow an increased penetration of intermittent forms of generation.
- At reasonable levels of penetration can substantially reduce the need for network augmentation and improve the security of energy supply relative to systems that rely on a few large generators. Distributed generation can reduce the need for transmission and distribution augmentation, increased levels of appropriately sited and designed distributed generation could lower the cost of electricity, compared to meeting demand through further investment in remote generation.
- Are relatively mature technologies in a range of applications, although there are technical, skill and regulatory barriers to early movers in applications like precinct-scale generation.

There are a number of specific barriers to uptake of distributed generation. In summary, the NEM was designed around the ongoing operation of an electricity system that predominantly consisted of large generators in a small number of regions and extensive transmission and distribution networks. As such, the rules, regulations and technology that are in place have created many anticipated and unanticipated barriers to the uptake of distributed generation. These barriers include:

- Impediments to generators capturing the full value created by distributed generation to energy users, networks and other parties
- Barriers in the connection process for distributed generation, including substantial delays, ad hoc processes and inequitable mechanisms for apportioning any costs for augmenting the grid. There are also impediments in the access regime for gas.

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- Innovation and first-mover disadvantages

The Council has developed a number of recommendations that would maintain investor confidence across the energy market and can be introduced without significant cost or disruption. However, these recommendations would substantially improve the economic efficiency of the market. The Council recommends:

- A long-term process to set up systems to ensure distributed generators can secure a fair return for the value of distributed generation, including both the energy and network values. This would require:
    - A mechanism to capture the time and location-specific energy value (MWh)
    - A mechanism to secure the network benefits of DG. Given the role of network companies in identifying and determining the value of deferred network investment, fully implementing this recommendation will require substantial reform to the way that networks are regulated, and could take many years to implement.
    - A mechanism to recognise and commodify the low-carbon value of cogeneration and trigeneration, so that consumers that place a high value on avoided emissions can pay a premium for these forms of generation.
- In the short-term, in some situations distributed generators could capture more of the network, electricity, heating and low-carbon benefits of DG if they are:
    - Allowed to retail electricity as lightly-regulated monopolies; and
    - Allowed to use the public network as virtual private-wire systems.
- However, it will take substantial time to address the multiple barriers to distributed generation and the use of distributed generation in novel applications will face first-mover barriers. Therefore, the Council recommends immediately establishing an interim system to reward the first 3,000 MW of cogeneration for its multiple benefits. These payments could be delivered through the state and territory, or ideally national, energy efficiency certificate schemes.
- Streamlining and regulating the process for connecting cogeneration to the grid
- Improving access to gas supply
- Targeted support for innovative applications of cogeneration and trigeneration

The Council's views on these matters are set out in the Council's recent submission to the Victorian Competition and Efficiency Commission, which is attached.

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8. Governance in the NEM

Australia's energy market needs to respond smoothly and efficiently to changes in technology and other factors. Recent government consultation sessions with industry representatives highlighted widespread concern from across industry about the slow pace of adoption of retail price deregulation and other changes to the energy market.

The Council believes that consumers and other market participants need to have a much stronger role in governing the energy market. Participating in debates around the design and operation of the NEM in an informed and meaningful way is resource intensive. This creates a barrier to involvement in energy market policy and, as a result, consumer groups, non-profit organisations and industry associations have historically had limited involvement in energy market design. As a result, energy policy debates have been dominated by a small number of well-resourced organisations such as network companies.

The Council recommends that the Australian Government undertake a review on how to improve consumer engagement in the design of the energy market. As a short-term measure, governments could increase the amount of funding that is available through the Consumer Advocacy Panel to build the capacity of consumer and other groups to engage in energy market policy.

Secondly, the Council notes that it is extremely difficult to secure smooth and efficient change to the energy market while it is run by a system of seven governments. The Council recommends that the NEM governance be improved by:

- State and Territory governments transferring power for decisions to the Commonwealth; and
- Governments divesting themselves of electricity assets, which create conflicts of interest in regulatory decisions.

Finally, the AER needs to be substantially strengthened in order to improve its ability to regulate network companies. The Council recommends that funding for the AEMC and AER be transferred from general revenue to a small surcharge on electricity.

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