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Clean Energy Council

Wednesday, 19 September 2012

Sophie Dunstone
Committee Secretary
Senate Select Committee on Electricity Prices
PO Box 6100, Parliament House
Canberra ACT 2600, Australia
By email: electricityprices.sen@aph.gov.au

RE: Clean Energy Council Submission to the Senate Select Committee on Electricity Prices

The Clean Energy Council (CEC) welcomes the opportunity to make a submission to the Senate Select Committee on Electricity Prices.

The CEC is the peak body representing Australia's clean energy and energy efficiency industries. Its priorities are to:

- create the optimal conditions in Australia to stimulate investment in the development and deployment of the world's best clean energy technologies
- develop effective legislation and regulation to improve energy efficiency
- work to reduce costs and remove all other barriers to accessing clean energy

The CEC works with over 550 member organisations and governments to identify and address the barriers to efficient industry development in the energy efficiency and stationary energy sector. The clean energy industry contributes to the generation of electricity using wind, hydro, solar, biomass, geothermal and marine energy as well as the emerging technologies and service providers in the energy efficiency sector including solar hot water and cogeneration.

Yours sincerely

[original signed]

David Green
Chief Executive

Overarching messages

Australia, in common with many other advanced economies, is experiencing significant increases in its electricity prices. These have very real consequences for vulnerable households and business and it is therefore important to fully understand what is driving these cost increases:

- World energy prices are particularly volatile at present as energy traders seek to capture the impact of the growing world demand for gas (accelerated by Japan's phase out of its nuclear capacity), and the extent to which un-conventional sources of gas will dampen prices in the medium term. This means Australia can often earn more by exporting its gas than using it domestically.
- Peak demand has surged in recent times with the dramatic growth in air conditioning load driving network companies to invest for the short summer peak, alongside the need to replace ageing infrastructure – when other options do exist.
- A perception of ever changing polices is driving political risk premiums to be priced into forward investment costs, and this is accentuated by the mixed ownership Australia has of its energy assets (some state owned, some with price control, others with more open markets) and the capacity this gives for investors be concerned about further risk.
- The National Electricity Market does not adequately reflect the needs of consumers nor the drivers for market transformation to a lower carbon future.
- Network costs are the biggest contributor to electricity bills, and are forecast to remain so into the future. Conversely, modelling continues to show that the contribution to electricity bills from so called 'green schemes', including the Renewable Energy Target (RET), is projected to decline to below 4 per cent in 2020.

Regulatory arrangements need to be made more relevant to the challenges of the future. This includes:

- The National Electricity Objective is the fundamental driver behind decision making processes undertaken by regulators in the national electricity market. However, this objective does not consider the requirements for sustainable development (economic, social and environmental needs). This limitation means that the long term interests of consumers cannot be fully considered by regulatory decision makers. The National Electricity Objective should be amended to ensure that it fully reflects the concept of sustainable development.
- The existing Demand Management and Embedded Generation Connection Incentive Scheme need to be reformed so that it drives innovation and cost reduction. Demand management and localised generation both have a significant potential to reduce costs to consumers *and* the environmental impacts of the electricity sector. The design of the current scheme only represents around 0.1-0.2 per cent of a distributor's revenue and lacks an effective mechanism to reward distributors when they create innovative solutions. It needs to be changed so it makes a real contribution to demand management or reduction.
- As energy consumption declines distributors are able to recover more of their revenue from a fixed component of the electricity tariff, thus negating any potential benefit to consumers from demand reduction, energy efficiency or embedded generation. In order *to* achieve efficient outcomes from demand management the current regulatory framework needs to be reformed in order to create an attractive investment environment for third parties such as

distributors, retailers, consumers and other energy service companies to invest in smart demand solutions

- Consumer expectations will require accelerated changes in the electricity sector. Experience has shown that failures occur where regulation is unable to keep pace with technology and consumer expectation and that significant pressure for rapid change will result. The CEC recommends that the mandate of the Standing Council on Energy and Resources be reinforced in order to better facilitate the transformative era the industry is now entering. This will enhance Australia's opportunity to exploit the benefits of demand-side alternatives to network investment, and reinforce the importance of consumer interests.
- Although the peak demand and carbon emissions reduction capability of embedded generation has been widely recognised, the connection process is not well coordinated and has led to the failure of many projects. The current connection frameworks are insufficient to manage the process efficiently and urgently require reform. In particular, distribution businesses need to establish a standard approach to the connection process and develop and provide consistent and concise technical requirements to those who want to connect.

Unless the issue of ever increasing network costs is tackled by reducing peak demand and enabling the regulated monopoly network businesses to develop new and innovative roles in reaction to long term demand management, then power bills will continue to rise indefinitely, and continue to place undue costs on consumers.

Response to Specific Issues

(a) Identification of the key causes of electricity price increases over recent years and those likely in the future

Key messages

1. *Unless the issue of ever increasing network costs is tackled by reducing peak demand and enabling the rectifying the inefficient practices of the regulated monopoly network businesses to fully respond to this challenge then power bills will continue to rise indefinitely, and continue to hurt consumers.*
2. *At around 40-50 per cent of an electricity bill, by far the greatest contributor to electricity price increases over recent years and into the future has been the electricity networks. Driven by the need to meet peak demand and the replacement of ageing infrastructure electricity networks are costing Australian consumers billions of dollars every year.*
3. *Approved network investment over the 5 year cycle from 2009 was over $7 billion for transmission networks and $35 billion for distribution networks, representing an increase of around 82 per cent in transmission and 62 per cent in distribution from the previous cycle. Over the same period approximately 32 per cent of the capital invested in our networks could be avoided by managing peak demand, meaning that consumers could be saving over $13 billion.*
4. *Air conditioning systems make the largest contribution to peak demand. Estimates are that for every $1,500 2 kilowatt domestic air conditioner a cost of around $7,000 is placed on all consumers due to its contribution to peak demand.*
5. *The contribution to electricity bills from 'green schemes', including the LRET, SRES and FiTs is placed at only 7.8 per cent in 2012 and projected to decline to 4.6 per cent by 2014 and then to continue to decline to below 4 per cent in 2020. The modelling makes clear that any change in these schemes aimed at reducing costs to consumers, such as a cancellation or altered scheme designs, will make little difference to consumer's bills over the long term.*
6. *Multi factor productivity in the electricity sector has fallen by 41 per cent since 1997/98. This puts productivity in the network sector back 23 years to 1989/90 levels.*

The components of an electricity bill

In every state except Victoria a local regulatory body sets 'standing offer' electricity contract prices. While competition in the retail sector allows retailers to offer lower prices, the standing offer provides the benchmark to which these prices are set against. When setting prices each state based regulator will consider the contribution to the bill from the following factors.

Wholesale Electricity Costs

In the National Electricity Market electricity retailers and large consumers purchase electricity from generators in one of two ways. Electricity can be either traded in a 5 minute ahead spot market, or it is contracted between generators and retailers at a fixed price. As contract values are subject to commercial confidence the local regulator is required to develop and apply a reasonable estimation technique to estimate the contribution to the standing offer from contracted electricity volumes.

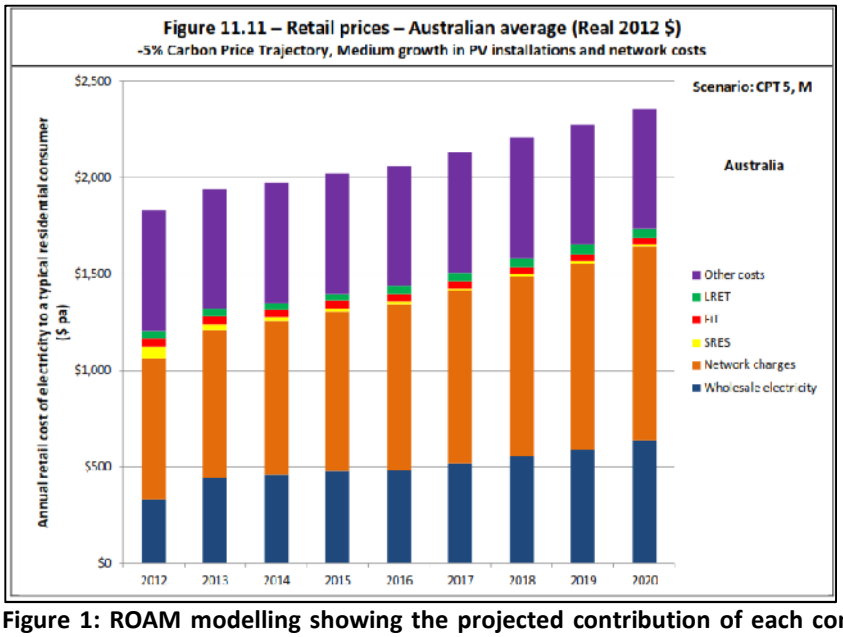

Figure 1: ROAM modelling showing the projected contribution of each component of the electricity bill to 2020 under a -5 per cent carbon trajectory[1].

Network Costs

The cost of the electrical networks are determined by the Australian Energy Regulator (AER) and passed directly through to consumers in the standing offer. In determining the annual network expenditure the AER undertakes an assessment of the operational and capital expenditure as proposed by the network companies. These companies also receive an ongoing payment for their historic capital investment. The AER adds these costs and allocates them on an annual basis for the period ahead and locks it in.

Large Scale Renewable Energy Target (LRET)

The Large Scale Renewable Energy Target is a legislated annual target for energy generation from renewable energy sources, with the ultimate target contribution of 41,000 GWh in 2020. Eligible renewable generators create certificates when they generate, and retailers are required to purchase a percentage of their electricity in certificates under the scheme. The price of certificates is set by the supply-demand balance in the market.

Small Scale Renewable Energy Scheme (SRES)

The Small Scale Renewable Energy Scheme provides small scale renewable energy sources (including solar hot water and household rooftop solar power installations) with a certificate representing the

[1] ROAM, 2012, *Impact of Renewable Energy and Carbon Pricing Policies on Retail Electricity Prices (report for the Clean Energy Council),* p. 45, available: www.cleanenergycouncil.org.au.

energy generated by the unit. Retailers must then purchase these certificates based on a percentage of their electricity sales.

Feed in Tariff Schemes (FiT)

Feed in tariff schemes are in place in most States of Australia to support the development of small scale renewable technologies, particularly household rooftop solar power. FiT schemes provide a fixed rate for the purchase of electricity from renewable generators feeding electricity into the grid. In most Australian states feed in tariffs rates are being reduced.

Other Costs

Other costs are included to account for a variety of additional costs which are required to support retailer operations and competition in the retail market. These include a Retailer Margin which is usually set to around 5 per cent of the retailer's revenue, and Retailer Operating Costs at around 7 per cent of the retail charge.

Drivers behind increasing bills

The CEC recently engaged ROAM consulting to undertake an assessment of the impact of each of these components on a typical Australian household's electricity bill (a copy of this report is included with this submission). Figure 1 shows the contribution from each component in 2012 through to 2020 as modelled by ROAM. ROAM's modelling shows that under the current carbon reduction trajectory the greatest contribution to electricity price increases in the future will be the electricity network. Comparatively, the contribution from 'green schemes', including the LRET and SRES is projected to decline substantially in the short term and continues to decline through to 2020. This is shown in Table 1 as a percentage contribution of these schemes to a typical bill. The modelling makes clear that any change in these schemes aimed at reducing costs to consumers, such as a cancellation or altered scheme designs, will make little difference to consumers' bills over the long term.

By far the greatest contribution to electricity price increases over recent years and into the future has been the electricity networks. Driven by the need to meet peak demand and the replacement of ageing infrastructure, electricity networks are costing Australian consumers billions of dollars every year.

Percentage Contribution of SRES, LRET and to Total Average Australian Electricity Bill -5% Carbon Price Trajectory, Medium growth in PV installations and network costs (Assumes average household usage of 7300 kWh pa)									
Year	2012	2013	2014	2015	2016	2017	2018	2019	2020
FiT	2.4%	2.2%	2.1%	2.0%	1.9%	1.8%	1.6%	1.5%	1.4%
LRET	2.1%	2.0%	1.7%	1.8%	1.9%	2.1%	2.2%	2.2%	2.0%
SRES	3.3%	1.2%	0.8%	0.6%	0.6%	0.5%	0.5%	0.4%	0.4%
Total	7.8%	5.4%	4.6%	4.5%	4.4%	4.4%	4.3%	4.2%	3.8%

Table 1: Comparison of the projected contributions of schemes that promote clean energy uptake shown as a contribution of the total bill for a typical Australian household. Source: ROAM[2].

There are two key components that make up the physical electricity network.

1. The electrical **transmission network** includes the large and very high voltage networks which transmit electricity across very large distances between load centres, such as cites and their surrounding suburbs, and generation hubs like the La Trobe and Hunter Valleys. These networks supply the load and also provide interconnections between the states on the eastern seaboard.
2. The electrical **distribution network** includes a very large and complex array of numerous poles and wires that run down suburban streets to distribute the electricity from the transmission network to consumers.

Australia's National Electricity Market consists of around 40,000 kilometres of transmission network and 750,000 kilometres of distribution network[3]. It is the most geographically dispersed system in the world and comprises one of the largest interconnected electrical networks relative to population.

As highlighted by the recent fact sheet released by the Department of Resources Energy and Tourism[4] the rate of spending on our networks has been increasing dramatically year on year for some time. This fact sheet presented data provided by the AER in their 2011 State of the Energy Market report. Figure 2 repeats one of the figures from the AER's report which shows the network spending over recent years and the 2009 projections of spending. In commenting on spending the AER notes that

> "*Network investment over the current five year cycle is forecast at over $7 billion for transmission networks and $35 billion for distribution networks. These forecasts represent an increase on investment in the previous regulatory periods of around 82 per cent in transmission and 62 per cent in distribution (in real terms)*"[5].

[2] Ibid.
[3] 2012, Australian Government Productivity Commission, *Electricity Network Regulation: Issues Paper*, p. 8, available: www.pc.gov.au.
[4] DRET, 2012, *Fact Sheet: Electricity Prices*, p. 3, available: www.ret.gov.au.
[5] AER, 2011, *State of the energy market 2011*, p. 62, available: www.aer.gov.au.

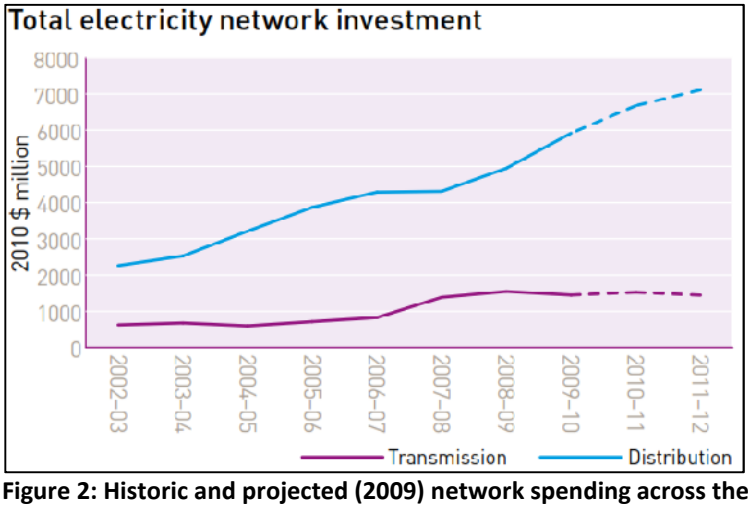

Figure 2: Historic and projected (2009) network spending across the NEM. Source: AER[6].

The Federal Government's Productivity Commission is currently inquiring into options to enable the AER to use benchmarking to increase the economic efficiency of their decision making processes. In producing their Issues Paper early in 2012 the Commission reveals that multi factor productivity in the electricity sector has fallen by 41 per cent since 1997/98. This puts productivity in the network sector back 23 years to 1989/90 levels[7].

One of the largest contributions to network costs is the need to maintain capacity to meet ever increasing peak electricity demand. Citing work by the Queensland Government's Department of Employment, Economic Development and Innovation, the recent Draft Energy White Paper identified that inefficient electricity pricing structures shield consumers from the real costs associated with peak electricity demand. The paper notes that "*while it may cost around $1,500 to purchase a 2 kilowatt reverse-cycle air conditioner, the same unit could impose costs on the energy system as a whole of $7,000 when contributing to peak demand*"[8].

Research by the University of Technology Sydney's Institute for Sustainable Futures reports that approximately 32 per cent of the capital invested in our networks could be avoided by managing peak demand. Their Decentralised Energy Roadmap[9] shows that in some Australian states peak demand is growing remarkably and exceeds twice the average demand (Figure 3) in some states already. This effectively means that the physical network must be constructed to a capacity that far exceeds that which is used on average.

[6] Ibid.
[7] Productivity Commission, 2012, *Electricity Network Regulation: Issues Paper*, p. 2, available: www.pc.gov.au.
[8] Department of Employment, Economic Development and Innovation, *Queensland Energy Management Plan*, Queensland Government, Brisbane, 2011, p. 4, proposes that incremental network expansion costs approximately $3,500 per kilowatt of additional capacity.
[9] Ibid.

Further, this additional capacity is only used for a very small fraction of the time. For example, analysis of the data available from AEMO for South Australia indicates that electricity demand within 20 per cent of the maximum only occurs for around 24 hours, or 0.27 per cent of the year[10].

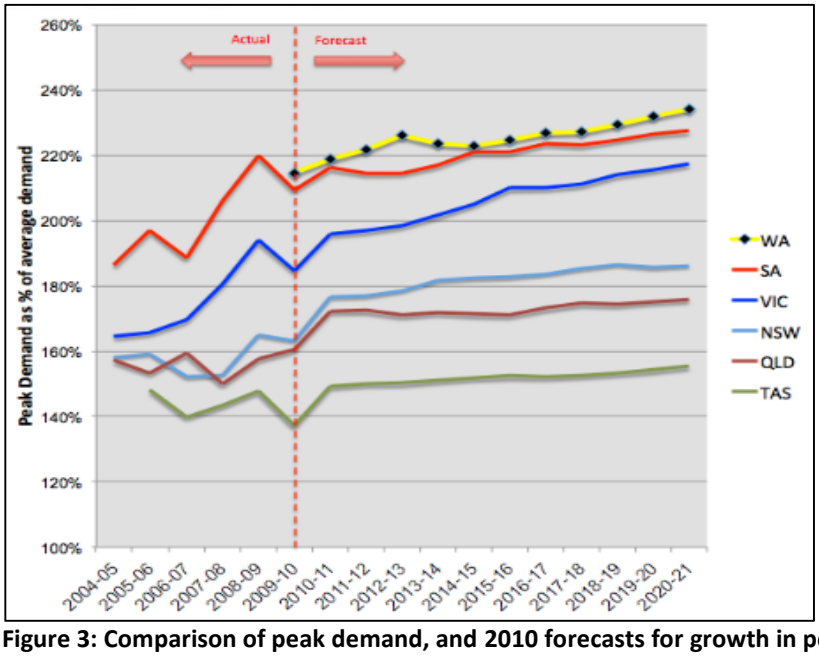

Figure 3: Comparison of peak demand, and 2010 forecasts for growth in peak demand, in different Australian states shown as a fraction of average demand. Source: Institute for Sustainable Futures[11].

A clear pattern has emerged for electricity price increases. Unless the issue of ever increasing network costs is tackled by reducing peak demand and rectifying the inefficient practices of the regulated monopoly network businesses, power bills will continue to rise indefinitely, and continue to hurt consumers.

[10] 2012, CEC analysis of 2011 price and demand data for South Australia, data source: AEMO, available: www.aemo.com.au.

[11] Dunstan, C., Boronyak., L, Langham., E., Ison, N., Usher J., Cooper C. and White, S. 2011, *Think Small: The Australian Decentralised Energy Roadmap: Issue 1*, December 2011. CSIRO Intelligent Grid Research Program. Institute for Sustainable Futures, University of Technology Sydney, p. 8.

(b) Legislative and regulatory arrangements and drivers in relation to network transmission and distribution investment decision making and the consequent impacts on electricity bills, and on the long term interests of consumers

Key messages

1. *The National Electricity Objective is the fundamental driver behind decision making processes undertaken by regulators in the NEM. However, the objective does not consider the requirements for sustainable development (economic, social and environmental needs) and this limitation effectively means that the long term interests of consumers cannot be met by regulatory decision makers.*
2. *Despite the transformative influences that legislated renewable energy and emissions reduction targets will have on the very market which is being regulated by the AEMC, the firm view of the AEMC is that they have no responsibility to consider them or even to enable them to be met at least cost, for the long term interests of consumers. The National Electricity Objective must be amended with the intent of making clear that the long term interests of consumers relates to sustainable development.*
3. *Demand management and embedded generation both have a very large potential to reduce both costs to consumers and the environmental impacts of electricity supply. Yet the current Demand Management and Embedded Generation Connection Incentive Scheme applied to distributors is not designed appropriately to make a material contribution to demand reduction. The scheme only represents around 0.1-0.2 per cent of a distributor's revenue and lacks an effective mechanism to reward distributors when they create innovative solutions. Furthermore, by design it assumes that the AER, as the economic regulator has the capacity to assess technical solutions in their potential merit.*
4. *The current Demand Management and Embedded Generation Connection Incentive Scheme needs reform with the introduction of appropriately placed incentives and targets for distributors to innovate and reduce peak demand.*

An enhanced market objective

The National Electricity Market was established by the South Australian Parliament under the National Electricity (South Australia) Act 1996. The Act sets out the National Electricity Law (NEL) and was endorsed by the Council of Australian Government members from market participant jurisdictions to complete its establishment. Section 7 of the NEL sets out the National Electricity Objective (NEO) as

> "*The objective of the law is to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to –*
>
> *(a) price, quality, safety, reliability, and security of supply of electricity; and*
>
> *(b) the reliability, safety and security of the national electricity system.*"[12]

[12] South Australian Government, 2012, *National Electricity (South Australia) Act 1996*, p. 36, available: www.legislation.sa.gov.vic.

As prescribed by the NEL, the NEO is the fundamental driver behind decision making processes undertaken by the AEMC[13] and the AER[14]. However, the NEO only makes a narrow judgement on what the *long term interests* of consumers are and history has shown that the AEMC and the AER will only consider the impact of their decisions through a test of economic efficiency.

A strong argument can be made that the long term interests of consumers is in fact a matter of sustainable development. As acknowledged by regulators in the United Kingdom[15] there are three facets which must be considered together where regulatory decision making intends to consider the long term interests of consumers:

(1) Economic principles to ensure that regulated monopolies can function efficiently and effectively and consumers see efficient electricity prices.

(2) Social principles to ensure equitable outcomes across society by recognising the needs of all current and future consumers.

(3) Environmental principles to ensure that the decisions of regulators are not producing outcomes that have negative environmental outcomes or that negatively impact market externalities (such as carbon reduction targets).

Despite this possible interpretation of the NEO, both the AEMC and the AER only apply an economic test when making determinations on rule changes or investment. Consumers are essentially viewed as constructs without needs outside of economic efficiency. On this basis it seems highly unlikely that the AEMC or the AER are capable of meeting the long term interests of consumers.

In fact, when asked, the AEMC will clearly state their belief that policies to reduce emissions and promote renewables are simply externalities. Despite the transformative influences of these policies on the market which is being regulated by the AEMC, their firm view is that they have no responsibility to consider them or even to enable them to be met at least cost, for the long term interests of consumers.

As has become evident from electricity price increases and extremely poor productivity in our electricity networks, there are questions as to whether the NEO is being met in its current form. The AER is seemingly under-equipped to do its job effectively to control prices as demonstrated by the current Limited Merits Review[16], Productivity Commission Inquiry into Electricity Networks[17] and numerous rule changes on the Economic Regulation of Network Service Providers[18].

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[13] Section 2 of the NEL states that "*In performing or exercising any function or power under this Law, the Regulations or the Rules, the AEMC must have regard to the national electricity objective*".

[14] Section 16 of the NEL states that the AER must "*perform or exercise that function or power in a manner that will or is likely to contribute to the achievement of the national electricity objective*".

[15] Owen, G. 2004, *Economic regulation and sustainability policy*, available: http://www.sustainabilityfirst.org.uk.

[16] http://www.scer.gov.au/workstreams/energy-market-reform/limited-merits-review/

[17] http://www.pc.gov.au/projects/inquiry/electricity

[18] http://www.aemc.gov.au/Electricity/Rule-changes/Open/economic-regulation-of-network-service-providers-.html.

The CEC recommends that the NEL be amended with the intent of making clear that the long term interests of consumers relate to sustainable development, as described above. Further, the NEL should be amended to recognise the interactions between the market and externalities such as carbon pricing and renewable energy targets and consumer protection policies.

Such a change can be undertaken by directly amending the NEO or other aspects of the NEL such as Section 32, where the AEMC could be directed to consider the means to efficiently meet the objectives of legislative frameworks which have direct implications on the National Electricity Market and market participants.

Demand Management and Embedded Generator Connection Incentive Scheme (DMEGCIS)

Demand management and embedded generation both have a very large potential to reduce both costs to consumers and the environmental impacts of electricity supply (and therefore the cost to consumers of moderating and repairing these environmental impacts).

As recognised by the AEMC some of the potential benefits of enhanced contributions from embedded generation could lead to the achievement of the NEO through "*lower long term prices faced by consumers due to an increase in market participation and thus more competition in peak generation capacity and improved efficiency in the use of peaking capacity*"[19]. Enhanced management of demand is expected to produce equivalent outcomes. Therefore these actions promote both efficient investment in, and efficient use of, electricity services for the long term interests of consumers of electricity.

As part of its requirement to make determinations on the capital expenditure and subsequent revenues for distributors the AER must prepare and consult on a Demand Management and Embedded Generation Connection Incentive Scheme (DMEGCIS). The scheme will then apply to the that particular distributor over the coming regulatory control period by creating an incentive to:

- defer expenditure on network augmentation, where it is efficient to do so;
- carry out non-network alternatives in managing expected demand, or to efficiently connect embedded generators;
- investigate and conduct broad-based and/or peak demand management, or embedded generator connection innovation projects or programs, and;
- control growth of electricity prices by increasing knowledge and experience with demand management and other alternatives to network augmentation.

As per the National Electricity Rules the AER is responsible for publishing and developing the scheme under consultation with the public and the relevant distributors. The scheme was initially developed in 2008. Due to the cyclic nature of distribution determinations the scheme was applied to distributors in New South Wales and the ACT in 2009, Queensland and South Australia in 2010, Victoria in 2011 and Tasmania in 2012.

In designing the scheme the AER created two relevant parts:

[19] AEMC (2012), *Small Generation Aggregator Framework, Draft Rule Determination*, 5 July 2012, Sydney, p. 6.

- "Part A" creates an annual demand management innovations allowance (DMIA) which, if not spent by the DNSP is returned to consumers in the second year of the next regulatory control period. Any over-spend is borne by the distributor.
- "Part B" creates a mechanism to compensate the distributor for any lost revenue resulting from demand reductions subsequent to Part A.

The AER undertakes an annual approval of the expenditure by each distributor in the scheme and produces performance reports. Due to the recent implementation of the scheme recent reports are only available for the 2009-10 and 2010-11 financial years. Thus performance is only available for seven distributors to date. The outcomes are summarised in Table 2.

Distributor	AER Approved Expenses		Allowance remaining in control periods
	2009-10	2010-11	
ActewAGL	$ 29,308	$ 8,362	$ 478,633
Ausgrid	-	$ 52,963	$ 5,110,074
Endeavour Energy	-	$ 163,827	$ 2,933,995
Energex	N/A	$ 50,320	$ 5,032,248
Ergon Energy	N/A	$ 458,148	$ 4,624,420
Essential Energy	$ 320,187	$ 245,000	$ 2,532,635
ETSA Utilities	N/A	-	$ 3,049,541
Total Annual Allowance	$ 2,300,000	$ 4,900,000	$ 24,500,000
Allowance Approved	$ 349,495	$ 978,620	
Percentage Used	**15%**	**20%**	

Table 2: Summary of the performance of the DMEGCIS to date[20].

Initially developed with a focus on demand management, the scheme was adapted at the start of 2012 to include the connection of embedded generation. To date the DMEGCIS has been a poor performer. This was recognised by the AEMC who, when making the final determination to include the connection of embedded generation stated their recognition that "*the benefits for the promotion and uptake of non-network alternative investment brought about by the rule are likely to be small*"[21]. Some of the reasons for this are discussed below.

Conflicting interests

As distributors are incentivised to make capital investments and receive a return through sales of energy a conflict of interest exists in distributors embracing the deferral of network investment. One factor compounding this issue is that any return from Part B of the scheme is very short lived when compared to the long term return on capital investment gained through a distributors regulated asset base.

Small contribution to revenue

[20] AER, 2012, *Decision: 2010-11 DMIA Assessment*, p. 6, available: www.aer.gov.au.
[21] AEMC 2011, *Inclusion of Embedded Generation Research into Demand Management Incentive Scheme*, Rule Determination, 22 December 2011 , Sydney, p. 32.

In general the incentive provided by the scheme represents only 0.1-0.2 per cent of a distributor's annual regulated revenue[22]. This means that distributors do not see the clear long term benefits of implementing any significant change resulting from the scheme.

Scheme administration

While the AER is responsible for approving the allowance and expended budget, each distributor must submit their proposed projects to the AER. Demand response projects are generally of a technical nature. Being an economic regulator the AER may not be best placed to assess the proposed costs or performance of the scheme over time.

For the reasons outlined above it is reasonable to expect that the long term continuation of the DMEGCIS scheme in this form is only capable of creating very small reductions in demand, with comparative benefits to consumers. The CEC recommends that the following changes to the scheme be considered:

Peak demand reduction target scheme

Part A of the scheme should be refined to include an annual target and reporting procedure for reductions in peak electricity demand. The target could be implemented through a peak demand reduction certificate scheme that would create certificates for DNSPs. Certificates would be created by demand side management activities in each year and then surrendered to the AER alongside performance reporting under the existing DMEGCIS scheme.

Distributors would be given targets to meet for certificate creation and then be penalised for failing to do so. Peak demand reduction activities could be undertaken by the DNSP itself or by third parties, as is currently the case in other certificate schemes that operate in Australia for energy efficiency (which place an obligation on electricity retailers).

Enhanced scheme performance monitoring

Given the technical nature of the proposals from distributors the AER may not be best placed to assess the scheme in its current form. Two options are available for this scheme to be implemented seriously: the AER's capacity could be enhanced to provide sufficient technical support or a central technical body could undertake a validation of the technical performance of the distributor's proposals, thus limiting the role of the AER to the economic evaluation only.

Alternatively, a certificate scheme may remove the need for the AER to make a technical assessment as scheme performance would be measured by the AER, not technical capability.

[22] CEC analysis of AER DNSP determinations.

(c) Options to reduce peak demand and improve the productivity of the national electricity system

Key messages

1. *Mechanisms such as direct load control and cost reflective charging regimes will play an important role in the reduction of peak demand.*
2. *Although the peak demand and carbon emissions reduction capability of embedded generation has been recognised by many, the connection process is mismanaged by distributors and has led to the failure of many projects. The current connection frameworks are insufficient to manage the process efficiently and desperately require reform.*
3. *Distributors are able to recover more of their revenue from a fixed component of the electricity tariff as energy transfers decline, thus negating any potential benefit to consumers from demand reduction, energy efficiency and embedded generation. In order to achieve efficient outcomes from demand management the current regulatory framework requires reform with the intent to harbor an attractive investment environment for third parties such as distributors, retailers and other energy service companies.*

As discussed previously, significant benefits are expected to be realised through better management of peak demand, which currently produces highly inefficient outcomes. In their Decentralised Energy Roadmap the Institute for Sustainable Futures reports that around 32 per cent of all capital spent on our electrical networks is required to service peak demand. Their calculations place the associated approved capital at $15 billion in the current regulatory control period[23]. Clearly, if only a fraction of this cost was directed to more innovative solutions to manage peak demand significant efficiency improvements could be achieved.

There are a range of options which can be adopted to tackle peak demand. Some approaches which are expected to achieve the desired outcomes are discussed below.

Direct load control

In many cases large electrical loads can adopt alternative designs which enable the deferral of electrical consumption. Some examples of this approach include

- Storage chillers for commercial grade air conditioning systems. In this case the chiller is cooled overnight and the stored energy is used the next day, thus offsetting the daytime electricity demand. Incentives for such a scheme could easily be incorporated into the current NABERS scheme.
- Directly controlled household air condition systems can be controlled remotely to stagger their usage during peak times. They receive a remote signal directly from the local distributor which will cycle their consumption during the highest peak demand days in order to reduce

[23] Dunstan, C., Boronyak., L, Langham., E., Ison, N., Usher J., Cooper C. and White, S. 2011, *Think Small: The Australian Decentralised Energy Roadmap: Issue 1*, December 2011. CSIRO Intelligent Grid Research Program. Institute for Sustainable Futures, University of Technology Sydney, p. 30.

the overall contribution to the peak. The system is cycled rather than turned off as this approach can retain acceptable temperatures in the home.

Cost reflective charging

A cost reflective charging regime would send a price signal to consumers which could more efficiently reflect the cost of supply during peak demand times. The current peak/off peak pricing system is based on legacy settings and no longer represents current consumption patterns, or the peakiness of demand.

The misalignment of price signals between the timeframe for peak tariffs and the wholesale electricity price during these times needs to be addressed. While the timeframes for peak tariffs are generally between 7 am and 11 pm, the wholesale market price does not align to this time profile. In order to drive adjustments in electricity usage and increased customer recognition of the importance of demand side response retail electricity prices need to more accurately reflect the occurrence of both peak and off peak wholesale electricity prices.

Currently, retail electricity costs are not really "prices" at all in the technical sense of a value determined by a market. As Iain McGill[24] argues, the more appropriate terminology for retail prices is a "schedule of fees", because costs imposed on consumers do not directly relate to the cost of supply at the point of delivery, but rather a series of approximations within a complex and inter-related framework (as was described earlier in this submission). Costs associated with the electricity network are similarly constrained with expenditure on network maintenance and augmentation capped over five year periods which blunts price signals to consumers. Without the broad implementation of rational pricing mechanisms across the energy market (such as 'dynamic' time-of-use pricing systems which reflect wholesale prices) consumers are not exposed to the real costs of supply.

Consumers need to be incentivised to change their behaviour and will only be able to respond to price signals provided these signals are able to be understood but accurately reflect their actual consumption patterns. Simshauser and Downer[25] demonstrated an improvement in the load curve and a reduction in overall energy unit costs with the introduction of dynamic pricing.

A shift to a cost-reflective pricing model would need to be carefully staged to ensure that sufficient information was available to consumers to allow them to modify their behaviour, but also to monitor and assist any demographic groups who might be disproportionally worse off under such a scheme due to an inherent inability to shift their time of use.

In Victoria the smart meter rollout has enabled Origin Energy to develop a tariff and web interface which will permit customers to see their consumption patterns and understand the implications of peak demand through a price signal[26]. With the appropriate information for consumers and

[24] Associate Professor, School of Electrical, Engineering and Telecommunications, Joint Director (Engineering), Centre for Energy and Environmental Markets, UNSW.
[25] Ibid.
[26] Origin Energy, 2012, Origin Smart: http://www.originenergy.com.au/originsmart/.

protection for price sensitive consumers such a scheme could make a significant contribution to reducing peak demand.

Enhanced access for embedded generators

Currently the connection process for embedded generators is problematic. Distributors envisage generator connections as an obligation rather than as part of their day to day activities. To date this approach has led to major inefficiencies in the connection process where distributors have limited staff available, no clear technical requirements for access and in some cases little interest in processing an application to connect. In Victoria these issues have led to the mistrust of distributors and exposed generation developers to millions of dollars of additional expenses and wasted time in the connection process.

While embedded generation can play a pivotal role in reducing costs to consumers and carbon emissions, a key barrier to the further deployment of such technologies lies within the distributors. In particular issues with the connection frameworks and the interaction between distributors and embedded generation proponents have been well documented[27,28]. The root causes of these issues include:

- The interpretation of the relevant legislative instruments to the favour of the distributor. In many cases these instruments fail to recognise that the connection process is undertaken between an independent applicant and a monopoly business. It is important to distinguish this from the actions of a distributor to manage its regulated assets. One sided terms in the legislation can be interpreted as protecting the interests of one party over another. The legislation needs to provide a level playing field for all parties.
- There is presently no incentive for a distributor to process a connection application; rather it is a condition of their licence. In conjunction, the introduction of a generator into their network has the effect of reducing the distributor's revenue from energy delivered, whist increasing the complexity and subsequent cost of their network assets.

These barriers are of particular concern when considering the applicability of embedded generation in a commercial or industrial setting, where the largest impact on reducing peak demand can be created. In many cases complications with connections or extortionate connection costs proposed by distributors without justification have caused proposed projects to fail.

Significant reform of the legislative instruments will be required to facilitate the widespread introduction of embedded generation. The National Energy Customer Framework package incorporates a clearer standardised connection process into the National Electricity Rules. Although the scheme remains untested a clearer standardised connection process will assist to address some of the barriers identified. These changes are important as the capacity of these technologies to contribute to the management of peak demand can be realised through a more efficient connection

[27] Sustainability Victoria, 2010, *Distribution Generation Experiences Analysis*, available: www.sustainability.vic.gov.au.
[28] ClimateWorks, 2011, *Unlocking Barriers to Cogeneration*, available: www.climateworksaustralia.org.

process. The CEC recommends that these changes are carried through in order to achieve efficient outcomes.

Misaligned incentives for distribution businesses

The current incentives for distributors are based around energy delivered to consumers which essentially guarantees their regulated revenue. However, this approach will increasingly become less viable within a regulatory framework which values demand management, energy efficiency and embedded generation.

Chapter 6 of the National Electricity Rules[29] provides a mechanism for distributors to develop their tariff structures in order to recover their regulated revenue. This enables distributors to recover more of their revenue from a fixed component of the tariff as energy transfers decline, thus negating any potential benefit to consumers.

The current regulatory arrangements fail to provide the right incentives for investment in demand reduction. There is an inherent focus on the short term and incentives to increase investment in network infrastructure[30] without capturing the overall benefit of infrastructure deferral which leads to an underestimation of the value of demand side management.

In order to achieve efficient outcomes from demand management the current regulatory framework requires reform with the intent to harbor an attractive investment environment for third parties such as distributors, retailers and other energy service companies. These businesses will play a crucial role in promoting more efficient outcomes through developing options, purchasing existing products or directly facilitating activities such as distributed generation.

[29] AEMC, 2012, *National Electricity Rules Version 51*, available: http://www.aemc.gov.au.
[30] Garnaut, 2011, *Garnaut Review 2011: 11 Electricity Transformation*, available: www.garnautreview.org.au.

(d) Investigation of mechanisms that could assist households and business to reduce their energy costs, including:

- ***(i) the identification of practical low cost energy efficiency opportunities to assist low income earners reduce their electricity costs,***
- ***(ii) the opportunities for improved customer advocacy and representation arrangements bringing together current diffuse consumer representation around the country,***
- ***(iii) the opportunities and possible mechanisms for the wider adoption of technologies to provide consumers with greater information to assist in managing their energy use,***
- ***(iv) the adequacy of current consumer information, choice, and protection measures, including the benefits to consumers and industry of uniform adoption of the National Energy Customer Framework,***
- ***(v) the arrangements to support and assist low income and vulnerable consumers with electricity pricing, in particular relating to the role and extent of dividend redistribution from electricity infrastructure,***
- ***(vi) the arrangements for network businesses to assist their customers to save energy and reduce peak demand as a more cost effective alternative to network infrastructure spending, and***
- ***(vii) the improved reporting by electricity businesses of their performance in assisting customers to save energy and reduce bills***

Key messages

1. *Improved energy efficiency is a critical part of any comprehensive strategy to tackle electricity prices (as well as other aligned objectives such as reduce greenhouse gas emissions).*
2. *Providing consumers with accurate and helpful information is a necessary but not sufficient element to an effective energy efficiency strategy. Much more needs to be done by governments to provide incentives and support for consumers, particularly those who face higher barriers to retrofitting their homes – such as renters and those on low incomes.*

Investigation of mechanisms that could assist households and businesses to reduce their energy costs

Energy efficiency remains one of the most important policies that governments can deliver to both reduce emissions and to protect consumers from rising electricity bills. There are growing concerns around the nation regarding rising electricity bills. A nationwide survey of 1000 participants conducted by Auspoll for the CEC in 2011 found that Australians wanted more support to save energy and money on their electricity bills. Ninety five per cent of people surveyed said they were concerned by rising energy costs and 89 per cent said they were willing to take action to use less energy.

A clear and consistent approach is needed to address the barriers to energy efficiency and drive the uptake of energy efficiency improvements. Long term policy stability is required to underpin investment in energy efficiency technologies. The CEC recommends a suite of policy initiatives to

assist households to increase their energy efficiency and manage their energy costs. The CEC and its members support the establishment of a national energy efficiency savings initiative that brings together the existing state schemes and extends coverage to all States and Territories. Bringing this policy under one set of rules will reduce confusion, reduce transaction costs and improve the delivery of energy efficiency measures to end users.

Consumer information and choice

Consumers require information, education, incentives and technology to make informed choices about the way they use electricity and the measures they can take to use energy more efficiently. The Auspoll survey identified that 73 per cent of Australians would welcome more information on how they could use less energy or use it more efficiently; however half knew little or nothing at all about the key aspects of their energy use. This reiterates the importance of access to information and data on electricity usage for consumers to be able to make informed choices about the way they use electricity. Consumers need to be able access their own consumption data to be able to see the differences that specific actions make on their energy use and to allow genuine competition and product differentiation in energy retailing.

Through its work on the AEMC Power of Choice Review, the CEC contends that to achieve this:

- Electricity consumers need to understand the full costs of electricity through transparent and cost reflective price signals.
- Consumers require access to easily interpretable information on actual electricity consumption through the time of use smart meters with integrated in-home display or web based customer portals.
- A central information hub to capture information captured by smart meters and provide analysis of usage and trend patterns for use by consumers and industry is required.
- Changes are required to the current regulatory requirements to facilitate commercial incentives for third parties to invest in demand side management and capture the benefit of infrastructure deferral.
- Options including voluntary load control programs, automated remote energy management systems, critical peak pricing and payments to businesses to reduce their energy use at requested times during peak demand periods should be further explored to facilitate consumer choices available to alter their consumption patterns. Regulatory arrangements around distribution business licensing and revenue determinations may also need to be reviewed to enable new demand management technologies to be trialled in conjunction with consumers.

The implementation of mandatory assessment and disclosure of a residential building's energy rating at the point of sale or lease to allow buyers and tenants to receive information on a building's energy performance is another crucial aspect to enable consumers to be able to make informed choices.

Low income households

Targeted support for low income households to increase their energy efficiency will also assist them reduce electricity costs. State government agencies, local government, energy retailers, and the community and welfare sector, all have experience in running energy efficiency programs and should be engaged in discussions about the most appropriate scheme designs to achieve this. The CEC advocates for programs involving partnerships between state government agencies, local government, industry and community and welfare organisations to educate and support the uptake of energy efficiency activities by low income households. Partnerships such as the one between the Brotherhood of St Laurence, Moreland Energy Foundation, Moreland City Council and Sustainability Victoria to audit and retrofit low income and disadvantaged households provide a practical example of this partnering between different consumer representation groups.

The Low Income Household Energy Efficiency Program (LIEEP) provides an opportunity to trial and evaluate new ways to improve energy efficiency in low income households. The data, information and lessons learnt from these trials needs to be shared with industry and other stakeholders to ensure the best aspects of the program are adopted in future programs that can be rolled out more extensively.

The United Kingdom's Green Deal program will enable a diversity of groups to offer consumers energy efficiency improvements at no upfront cost to consumers then recoup payments through instalments on their energy bill. Alongside the legally mandated Energy Company Obligation with its focus on 'hard to treat' properties, and low income and vulnerable households, the UK is developing a program that provides a unique opportunity for Australia to monitor and potentially build upon.

(e) Investigation of opportunities and barriers to the wider deployment of new and innovative technologies, including:

(viii) direct load control and pricing incentives,

(ix) storage technology,

(x) energy efficiency, and

(xi) distributed clean and renewable energy generation

Key messages

1. *There are a wide range of barriers that exist to the widespread uptake of innovation in demand management and embedded generation technologies. The scope and breadth of these issues makes clear that incremental changes to the regulatory frameworks and market rules will be insufficient to drive outcomes which serve the long term interests of consumers.*
2. *The CEC recommends that the existing role of the Standing Council on Energy and Resources be reinforced with a stronger mandate to coordinate the interactions between the numerous and significant challenges facing market evolution.*

There are a range of barriers that exist to the widespread uptake of innovation in demand management and embedded generation technologies, including:

- Misaligned incentives for distributors;
- Inefficient connection processes;
- Limited consideration of alternatives to network investment and a regulatory regime which incentivises network investment and does not promote innovation;
- Poorly designed schemes intended to promote innovation but lack an effective incentive mechanism, and;
- A lack of appreciation for a holistic view of the *long term interests of consumers* by regulatory decision makers.

Indeed these points have only outlined some of the barriers that exist. A detailed review of the issue is included in the Institute of Sustainable Futures' Decentralised Energy Roadmap where 20 unique barriers are identified[31]. The scope and breadth of issues identified makes clear that incremental changes to the regulatory frameworks and market rules will be insufficient to drive outcomes which serve the long term interests of consumers.

International experience has identified that there are significant opportunities for economic, social and environmental efficiencies from innovation in the way we generate and use electricity. In the case of Australia opportunities will remain scarce whilst the extent of these barriers remains present.

[31] Dunstan, C., Boronyak., L, Langham., E., Ison, N., Usher J., Cooper C. and White, S. 2011, *Think Small: The Australian Decentralised Energy Roadmap: Issue 1*, December 2011. CSIRO Intelligent Grid Research Program. Institute for Sustainable Futures, University of Technology Sydney.

There is absolutely no doubt that Australia's physical electricity system and supply sector is under pressure for significant reform. The physical network infrastructure can be expected to be transformed as a result of new dynamics in consumer expectations, driven by

- increased use of small and micro scale renewable energy and cogeneration technologies,
- advancements in innovative technical solutions and access to new data,
- increasing customer importance on energy efficiency,
- low cost electrical storage solutions,
- uptake of electric vehicles,
- consumer expectations for controlled electricity prices and,
- consumer expectations for carbon emissions reductions.

The CEC expects that there is a very real risk that consumer expectations will accelerate these changes in the very short term. Experience with regulation has shown that failures occur where regulation is unable to keep pace with technology and consumer expectations. To date the current regulatory framework has been incapable of recognising issues and opportunities for reform and to produce efficient outcomes.

The CEC recommends that the existing role of the Standing Council on Energy and Resources be reinforced with a stronger mandate to coordinate the interactions between the numerous and significant challenges. This action is expected to enhance Australia's opportunity to exploit the benefits of demand-side alternatives to network investment, and reinforce the importance of consumer interests.

Closing

The CEC would like to thank the Committee for the opportunity to make this submission and outline the concerns we have about the barriers to the greater participation of demand management and the protection of consumers from increasing electricity bills.

There is an untapped potential to reduce bills for the long term through demand management, energy efficiency and embedded generation. However, the current regulatory frameworks are preventing this resource from being accessed effectively. A more driven and coordinated approach will be required to successfully achieve the changes required.

The CEC will be happy to meet with the Committee to discuss the contents of this submission and the CEC's position.