

Commissioners Dr Matthew Butlin and Deborah Cope  
Victorian Competition and Efficiency Commission  
GPO Box 4379  
MELBOURNE VIC 3001

15 June 2012

**Re: Inquiry into Feed-in Tariffs and Barriers to Distributed Generation**

Dear Commissioners Butlin and Cope

The Victorian Competition and Efficiency Commission (VCEC) sought comment on the Draft Report *“Power from the People – Inquiry into Distributed Generation”* (referred to as the Draft Report). This submission provides the Energy Efficiency Council’s response to the Draft Report.

The Energy Efficiency Council is the peak body for energy efficiency, demand response and cogeneration, and brings together Australia’s top expertise in demand-side to support the development of policy and programs.

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. This improves the energy productivity of the Victorian economy, protecting businesses and households from rising fuel 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. Expenditure on network infrastructure, largely driven by growing peak demand, is currently the main factor in increasing electricity prices across the NEM; and
- 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.

However, there are substantial barriers to the efficient uptake of DG. The National Electricity Market (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 DG. These barriers include:

- Impediments to generators capturing the full value created by DG to energy users, networks and other parties
- Barriers in the connection process for DG, including substantial delays, ad hoc processes and inequitable mechanisms for apportioning any costs for augmenting the grid
- Innovation and first-mover disadvantages

Therefore, the Council recommends that an appropriate objective for Victoria’s policy on distributed generation would be *“to maximise distributed generation’s contribution towards the long-term interests of Victorians”*. To achieve this objective the Victorian Government would need to:

- Ensure that distributed generators secure a fair return on the value of their DG.
- Reduce barriers that impede the efficient deployment of DG
- Ensure that distributed generators compete on a level playing field with other generators, taking into account both energy markets, carbon markets and subsidies.
- Play a role in reducing the barriers to innovation and emerging technologies.

The Council's submission focuses on cogeneration and trigeneration. While many of the points raised in this submission are relevant to multiple forms of DG, VCEC should assume that all references to DG refer to cogeneration and trigeneration. The Council's submission does not comment on the appropriateness of Feed-in Tariffs (FiTs) for PV and other renewable energy systems.

The Council has received informal comments from some members that connecting cogeneration and trigeneration units in Victoria is more challenging than in other states. There could be a number of factors that have driven these Council members' experiences, including the available capacity to accommodate cogeneration in central Melbourne.

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 DG, including both the energy and network values. This would require:
  - o A mechanism to capture the time and location-specific energy value (MWh)
  - o A mechanism to secure the network benefits of DG. Given the role of Network Service Providers (NSPs) 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.
  - o 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:
  - o Allowed to retail electricity as lightly-regulated monopolies; and
  - o Allowed to use the public network as virtual private-wire systems.
- However, it will take substantial time to address the multiple barriers to DG and the use of DG 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. In Victoria, these payments could be introduced on an interim basis through the Victorian Energy Saver Incentive.
- 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

Australians deserve energy markets that serve their interests. The Energy Efficiency Council looks forward to working with the VCEC to ensure that the energy market in Victoria meets the needs of the community.

Yours sincerely

Rob Murray-Leach  
Chief Executive Officer

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## 1. Key Policy Recommendations

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

### 1. Develop a long-term system to reward DG owners for the value of DG

- 1.1 DG owners should be paid a transparent, location-specific network support payment where they reduce or defer expenditure on the grid. This will require a number of reforms to the way that Network Service Providers (NSPs) are regulated, including:
  - Amending the way that NSPs are incentivised
  - Improving the regulatory process for NSPs
  - Improving requirements for the release of annual maps of network constraints
  - Providing a minimum target for demand-side activity by NSPs
- 1.2 Develop a national mechanism to commoditise the low-carbon value of cogeneration
- 1.3 Set up a simple, transparent system that allows distributed generators in some situations to retail electricity to consumers 'light red-tape' regulated monopolies.
- 1.4 Develop virtual private wire rules to allow distributed generators to use the public electricity network to supply electricity to local sites (e.g. multiple council buildings) and pay network charges that reflect the cost of using the network for very short distances.

### 2. Set up an interim system to reward DG owners for the value of DG

- 2.1 Victoria should advocate for a system to support the first 3,000 MW of cogeneration in Australia to reflect the multiple market barriers and the difficulties in capturing the full benefits of cogeneration in advance of NSP reform.
- 2.2 In advance of a national system, Victoria could rapidly introduce interim financial support for cogeneration through the Victorian Energy Saver Incentive. The incentive should only be provided to cogeneration that:
  - Exceeds a minimum threshold of efficiency (e.g. 50 per cent), with additional incentives for cogeneration units as their efficiency increases beyond this threshold.
  - Is below 30 MW and runs for more than 2,000 hours per year.

### 3. Streamline the process for connecting DG to the grid

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

**4. Improve access to gas networks**

- 4.1 Invest in the backbone gas supply network and
- 4.2 Establish clear rules about who pays for minor expansions of the gas network.
- 4.3 Undertake a national study into competition and accessibility in gas supply.

**5. Address innovation and early mover disadvantage**

- 5.1 Establishing a system to provide financial support for the first 3,000 MW of cogeneration in Australia would partly address innovation and early mover disadvantage.
- 5.2 The Victorian Government should consider a targeted system of grants or direct investment to support innovative application of cogeneration in Victoria.

## 2. Objectives for Distributed Generation Policy

In its Draft Report, VCEC recommends that the purposes for a FiT should be to “ensure distributed generators have access to a fair and reasonable return for the value of their generation” (pxxv). VCEC’s then extends their proposed objective for a FiT to become the goal for all DG policy.

The Council believes that this is too limited as an overarching objective for DG policy. The Council believes that the objective for DG policy should consider both the National Electricity Objective (NEO) and other policy objectives of the Victorian Government. The NEO is:

*To promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to –*

1. *Price, quality, safety, reliability, and security of supply of electricity; and*
2. *The reliability, safety and security of the national electricity system.*

Removing the barriers to DG distributed generation would contribute to many of the NEO’s goals. For example, appropriately sited, sized and managed distributed generation can:

- Reduce electricity prices by avoiding or deferring investment in supply-side infrastructure; and/or
- Improve safety in regional areas by obviating for the need for long-distance distribution systems that create bushfire and other safety hazards.

While the NEO focuses on just the price of electricity, it is more appropriate to focus on total energy bills. Even in situations where cogeneration and trigeneration deliver more expensive units of electricity than conventional supply, they can still deliver substantially lower energy bills for consumers if the distributed generation:

- Helps consumers reduce the amount of electricity that they need to achieve their objectives; and/or
- Delivers other energy services such as heating and cooling.

However, a number of factors mean that DG is prevented from fully delivering on its potential to the NEO. A number of well-documented barriers and market distortions result in over-investment in networks and supply-side infrastructure and under-investment in distributed generation, energy efficiency and demand-response. As a result, the National Electricity Market (NEM) is failing to deliver the best outcomes for consumers in respect to total price, quality, safety, reliability and total electricity bills.

In addition to barriers within the NEM, there are barriers to DG that lie outside the NEM. For example, there are barriers to innovation and first-movers in situations like precinct-scale cogeneration. While these barriers may lie outside the responsibilities of NEM bodies like the AEMC, tackling these goals would contribute towards the NEO.

Furthermore, cogeneration and trigeneration can play a critical role in reducing greenhouse gas emissions. The Energy Efficiency Council agrees that, if a carbon price is in place, governments should not pay for reduced carbon emissions. However:

- A carbon price needs to be accompanied by other measures to address the range market failures that impede the uptake of low-carbon technologies;
- A mechanism needs to be established to commoditise low-carbon generation for consumers that wish to pay a premium for low-carbon generation; and
- If the carbon price is removed in the future, additional policy mechanisms would be required to internalise the carbon externality.

Therefore, the Energy Efficiency Council recommends that VCEC adopt a much broader objective for distributed generation policy. The Council recommends that:

*The Objective for Victoria's policy on distributed generation should be to maximise distributed generation's contribution towards the long-term interests of Victorians. To achieve the objective, the Victorian Government will seek to:*

- *Ensure distributed generators have access to a fair and reasonable return on the value of their generation, including the value of the energy and the value to the network.*
- *Ensure that market structures and regulations do not disadvantage distributed generation relative to other technologies, either directly or indirectly.*
- *Play a reasonable role in the barriers to innovation and emerging technologies.*
- *Ensure that distributed generators compete on a level playing field with other generators with respect to the carbon-intensity of their energy.*

### 3. Fair compensation for the Value of Distributed Generation

DG delivers a series of benefits to multiple parties in the electricity market. These include:

- Electricity (MWh) and other forms of usable energy. In the case of cogeneration and trigeneration, DG delivers electricity, heating and cooling.
- Network services, including frequency modulation and reducing or deferring the need for NSP expenditure to augment the grid
- Additional benefits such as reduced externalities like carbon emissions.

While distributed generators can often capture substantial value from DG, they are rarely able to capture the full value of DG, because the benefits are split between multiple parties (split incentives) and distributed generators face barriers in securing fair payment for benefits from one or more parties. Unless this is resolved, investment in DG in Victoria will fall well below the economically optimum level, which will result in lost welfare for consumers.

The Council believes that, ideally, distributed generators would be able to capture the full value of DG through market systems that allow the beneficiaries of the DG to pay the generators for their services. However, the NEM is not a simple, natural market – it is a highly regulated market that includes competitive and monopolistic elements. Therefore, some element of regulation is both inevitable and desirable in enabling distributed generators to capture the full value of DG.

Furthermore, the development of a fully efficient framework to fully support DG could take many years. Therefore, the Energy Efficiency Council recommends an approach that includes:

- Setting up systems immediately to enable distributed generators to capture more of the value of DG through the market where suitable (e.g. retailing directly to consumers as regulated monopolies in some situations)
- Starting the longer-term process to enable distributed generators to capture the full value of DG in a range of situations (e.g. regulating and incentivising NSPs to ensure that distributed generation owners receive appropriate payments for network benefits)
- Setting up an interim system to reward distributed generators for the benefits of DG while these barriers are being tackled. Although a transitional payment system is less efficient than if the NEM fully and fairly recognised the value of distributed generation, it would be substantially more efficient than the current situation where most distributed generators are unable to capture much of the value of their DG.

#### The value of energy

The benefits of cogeneration come from being able to provide both energy services (heat and cooling) and electricity. The value of these services will depend on the time and location of supply.

However, the NEM does not create a level playing field and consumers do not face electricity prices that reflect the time and cost of supply. For example, in some locations and times the cost of supply could exceed \$12 per kWh based on wholesale costs alone, but most consumers would pay a maximum price of 30 cents per kWh. If network costs were factored in, it becomes apparent that the price that consumers face is not at all cost-reflective<sup>1</sup>. Given that the benefits of DG are location specific, this puts DG at a considerable disadvantage in securing a fair price from consumers.

If a DG owner sells electricity into the grid they currently have two options:

- Incur substantial costs to register as a generator and sell into the wholesale market; or
- Negotiate for a price with a retailer or other registered market participant.

These options may not suit every party, and the Australian Electricity Market Operator (AEMO) is currently looking at a framework for smaller operators. If the market works well, parties would be able to secure a price for their electricity that reflects the wholesale price for electricity that they feed into the grid.

However, the wholesale price of electricity is only one part of the electricity supply chain. Whether a generator sells to a retailer or into the wholesale market, as soon as a distributed generator sells into the grid they instantly lose any of the value from reduced losses, reduced use of network

<sup>1</sup> Australian Energy Market Commission 2012, *Power of Choice Review Directions Paper*, AEMC, Sydney



infrastructure, reduced network investment and any premium that consumers put on the low-carbon value of the generation.

In the case of cogeneration and trigeneration, distributed generators also need to capture the value of heat and other services created by DG. Capturing the value of heat and other services from distributed generation is complex. Heating and cooling typically need to be sold to local customers using purpose-built distribution infrastructure. This means that generators typically need long-term contracts for heating and cooling with a particular proportion of energy users in an area in order to justify investment in both the generation equipment and the distribution infrastructure.

### **The value of network services**

There are two issues that are relevant for capturing the value of distributed generation and networks. Firstly, there are currently rules that prevent cogenerators from using the distribution network to move energy between sites (e.g. two council offices) at a cost that reflects the actual cost of using the network to move energy such short distances. These rules are being addressed in some jurisdictions. Secondly, and more substantially, distributed generation can deliver savings by substantially reducing the need to augment network infrastructure.

The cost of providing network infrastructure varies between locations, and network losses vary between locations. However, the NEM rules require 'postage-stamp' pricing, so that energy prices are heavily smeared between regions. Without significant technological and corresponding regulatory intervention, it would be unreasonable to expect that widespread nodal pricing will be implemented within the next two decades. Therefore, energy prices will continue to fail to reflect the cost of use at specific locations.

As a result, while distributed generation can reduce costs to consumers by avoiding or deferring the need to build network services to meet peak demand, distributed generators can generally only secure this value through negotiation with Network Service Providers (NSPs).

NSPs are regional monopolies, and generators face significant power asymmetries in securing a fair value for reducing the need for network augmentation. Furthermore, recent work by the AEMC<sup>2</sup> confirms that in many situations, while reducing network augmentation may be in the interest of consumers, it may not be in the interests of NSPs.

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

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

Therefore, setting up a system to pay distributed generators a transparent, location-specific network support payment where they reduce or defer expenditure on the grid will require substantial reforms. This reform could take several years, and will require:

- Aligning NSP incentives with consumers' interests. NSPs need to have the right incentives to invest in demand-side activities when they are more cost-effective than supply side options for consumers.
- Improving the transparency and sufficiency of the regulatory and planning process to ensure that NSPs investment decisions are efficient.
- Addressing critical skill and culture issues in networks. Many NSPs have limited capability to estimate the reliability and costs and benefits of demand-side options or implement those options. This means that, even if NSPs faced appropriate incentives, they would likely under-invest in demand-side activities. To overcome this barrier, it is critical that NSPs be required to invest in a minimum level of demand-side activity.

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<sup>2</sup> Australian Energy Market Commission 2012, *Power of Choice Review Directions Paper – Supplementary Paper, Demand Side Participation and Profit Incentives for Distribution Network Businesses*, AEMC, Sydney

- Opening up the market for demand-side activities that offset network investment to competition. At a minimum, this means that:
  - o NSPs should be required to provide robust data on upcoming network constraints; and
  - o Contracts to address constraints as contestable service should be put out to tender, with NSPs ring-fenced businesses allowed to bid for that work.

The Energy Efficiency Council strongly advocates that this type of system should be established. However, given the time to establish this type of system we believe that setting up imperfect transitional measures will be critical.

### **Carbon value**

While a carbon price is in place, DG will not need additional support for its public carbon value. However, some consumers will place a higher value on the low-carbon value of cogeneration and trigeneration than the carbon price. If a cogenerator is selling this directly to a discerning consumer they may be able to capture this low-carbon value. However, if the electricity is exported to the grid then commoditising this value will be critical, in the same way that Green Power commoditises the low-carbon value of renewable energy.

### **Short and medium-term mechanisms for securing the value of DG**

Distributed generators face considerable barriers to capture the electricity value, network value, heating value, cooling value and low-carbon value of DG.

Where distributed generators currently sell all these services to an off-grid user (either themselves or another client) they can capture most (but not necessarily all) of these benefits in a long-term contract.

Where distributed generators sell all these services to a small number of clients directly they can capture much (but not necessarily all) of these benefits. However, there are a number of regulations that impede these transactions, such as requirements for competition in electricity supply. While the intent of these regulations to protect consumers is laudable, the Council recommends that this intent can be met more appropriately by allowing distributed generators to sell as lightly regulated monopolies. A system has recently been introduced in the UK that allows distributed generators to operate as monopoly retailer as long as the price is charged is within the bounds of the prices charged by local retailers.

Where distributed generators can sell directly to consumers using the public network, they should be allowed to use the public network as virtual private-wire systems with appropriate charges. The network costs of supplying DG to consumers is substantially lower than the costs for centralised generation, and private wire rules would allow distributed generators to pass on these lower costs to consumers. Furthermore, this would allow distributed generators to retail directly to consumers, allowing them to capture some additional benefits. This would not allow distributed generators to capture the full benefits of the DG system, but it would allow them to capture more than they currently can.

However, it is clear that in most of these cases distributed generators will only be capturing a fraction of the benefits of their DG systems, particularly network benefits. While the Council believes that these benefits should ideally be rewarded through location-specific network support payments, we believe that it will take some years to introduce this type of scheme.

Therefore, the Council recommends a transitional scheme that provides financial support for the first 3,000 MW of cogeneration in Australia. While this would be less reflective of benefits than a location-specific network support payment, it would be significantly more cost-reflective than no payment at all. As a result, this type of system would increase the overall economic efficiency of the NEM.

In advance of a national system, Victoria could rapidly introduce interim financial support for cogeneration through the Victorian Energy Saver Incentive. The incentive should only be provided to cogeneration that:

- Exceeds a minimum threshold of efficiency (e.g. 50 per cent), with additional incentives for cogeneration units as their efficiency increases beyond this threshold.
- Is below 30 MW and runs for more than 2,000 hours per year.

## 4. Connecting to the grid

The Energy Efficiency Council welcomes VCEC's recognition of the significant barriers to connecting cogeneration.

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

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

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

- Uncertain and often completely unjustifiable timeframes for negotiating an agreement. In Victoria, the connection approval process is typically more than 6 months with many taking 12 months or longer.
- Uncertain and often unjustifiable costs for studies to determine the costs of connecting to the grid.
- Uncertain and often unjustifiable costs for connecting to the grid.
- Inequitable rules about who pays for network upgrades to facilitate cogeneration. Currently, the last cogeneration unit that wants to connect to the grid before an upgrade is required to pay the full cost of the upgrade, despite the fact that other units may connect before or after the upgrade. In contrast, the cost of upgrades to the grid to address rising energy demand are generally smeared across all energy users.

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

### **Recommendations:**

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

## 5. Issues with gas infrastructure

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

### Recommendations

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

## 6. Innovation and first-mover disadvantage

There are substantial barriers to the entry of novel technologies, or the use of technologies in locations and contexts that they have not been used, including:

- Regulatory barriers
- Access to skills
- Increased technology risk

These issues are covered extensively in Chapter 18 of the 2008 Garnaut Review<sup>3</sup>.

The Council believes that financial support for the first 3,000 MW of cogeneration and trigeneration in Australia (as discussed in section 3 of this submission) would provide some support to address first-mover disadvantage. However, the Council recommends that this is accompanied by either grants or direct investment in cogeneration and trigeneration projects in novel applications.

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<sup>3</sup> Garnaut, R. 2008 *The Garnaut Climate Change Review*, Cambridge University Press, Melbourne.