



**Clean Energy Council submission to the Essential Services Commission's
Distributed Generation Inquiry Stage 2 Discussion Paper
The Network Value of Distributed Generation**

Executive Summary

The Clean Energy Council (CEC) welcomes the opportunity to provide feedback on the Essential Services Commission's (ESC's) discussion paper on the network value of distributed generation.

The ESC's discussion paper breaks new ground by considering the network value of distributed generation and how to monetise and provide appropriate incentives for that value. It is commendable that the ESC is tackling this complex area of policy which has until now been largely overlooked by policy makers and regulators in Australia.

We are pleased that the review has considered the issue broadly and that its analysis has not been constrained by narrow terms of reference, as has been the case with so many reviews of feed-in tariffs by regulators and policy makers in other jurisdictions.

Our responses to the specific questions raised in the draft report are summarised below. We would be very happy to discuss these issues in further detail with the ESC. We look forward to contributing further to this review.

Responses to questions raised in the draft report

Are there any other aspects of our definition of distributed generation that we should consider, in this stage of the inquiry?

For the purpose of the review, 'distributed generation' is defined as distributed generation below 5MW capacity, from any source or fuel type and including battery storage. This is sufficiently broad and there are no other aspects of the definition we want to propose at this stage of the inquiry.

What data and evidence is available about the potential network benefits of battery storage?

The need for data and evidence is not clear. Increasing the level of 'controllability' of load and generation should lead to an increasingly optimum utilisation of the existing network assets. In turn this should reduce the need for investment in the assets to meet sub-optimum conditions such as building for peak demand. Economic signals are the best measure to drive customer responses in the desired way.

On what basis should the network benefit from distributed generation be assessed – on the total output or on the total exports of the generation system?

The network benefit should be assessed on the extent to which distributed generation relieves demand on the network. Therefore total output should be assessed.

What do you see as the main differences between network-led and proponent-led DG in terms of the network benefits they deliver?

The network benefits are not dependent on whether storage is behind the meter or on the network. However, whether storage is owned by networks or consumers will influence whether and how the benefits can be monetised by the owner and this will determine how the assets are utilised to maximise financial benefits.

Are there any other aspects of our definition of value that we should consider, in this stage of the inquiry?

The review seeks to identify the direct and indirect effects that produce benefits that can be valued in monetary terms. This is reasonable.

Are there any other aspects of our proposed framework for assessing network value that we should consider?

The Commission should be aware of the CEC's previous work in this area (<http://fpdi.cleanenergycouncil.org.au/reports/value-of-small-scale-generation.html>).

Do you agree with the Commission's proposed framework for the network value stage of the inquiry? Are there alternative approaches?

The Commission's proposed approach seems reasonable.

Beyond those identified in the paper, are there other examples of applied methodologies for calculating the network benefit that the Commission should consider?

The Commission should be aware of the CEC's previous work in this area (<http://fpdi.cleanenergycouncil.org.au/reports/value-of-small-scale-generation.html>).

Can you suggest any alternative or additional categories of network benefits regarding distributed generation?

Some effects of distributed generation can deliver multiple benefits and in some cases the benefits could be of both a private and public nature. For example, islanding capability can provide security, convenience and safety benefits. Safety benefits (eg. bushfire risk mitigation) can be both a private and public benefit.

Can you suggest alternative or additional characteristics of distributed generation (that effect the capacity of distributed generation to provide network benefits)?

There are four main characteristics proposed for consideration by the review: location of generation; time of generation; 'firmness' of generation; and size. In addition to these characteristics the review should consider the capability of the generation to deliver different forms of network services. eg. reactive power or power quality rectification capability or the ability to contribute to ancillary services such as frequency control.

Are there circumstances in which a fleet or 'portfolio' of passive distributed generation systems can provide suitably firm generation capacity to create circumstances in which network benefit is created?

Yes. The discussion paper describes some examples of direct control mechanisms. Financial signals can also be used to influence the response of distributed generators. A fleet of distributed generators could be expected to respond to financial signals. Response to financial signals is not as 'firm' as direct control and some allowance for the reduced level of 'firmness' would be needed.

The stochastic nature of embedded solar generation should also be considered. Recent CEC work has identified that geographically diverse solar PV can increase the overall reliability of this generation, and therefore the firmness of network support. See the report publication page <http://fpdi.cleanenergycouncil.org.au/reports/potential-of-embedded-generation.html>

What alternative or additional building blocks of a methodology should be considered for determining the network benefit of distributed generation?

The approach to quantifying the network congestion benefit seems reasonable. CEC supports the inclusion of the value of mitigating bushfire costs and risks as well as the potential reduction in insurance costs.

What do you see as the most appropriate unit of analysis and level of granularity is for the assessment of network benefits?

The proposal to analyse down to the level of 11kV feeders is appropriate, however consideration should also be given to the transformer equipment that converts this to lower voltages. Units of analysis should incorporate avoided costs, the monetary value of avoided risks and a value attributed to avoided non-monetary impacts.

What publicly available data sources can be accessed to apply the methodology, particularly with respect to network constraint and demand?

The University of Technology Sydney and the Institute for Sustainable Futures recently publicly launched new network opportunity maps, which might assist the review with its analysis. The network opportunity maps are available at:

<http://www.uts.edu.au/research-and-teaching/our-research/institute-sustainable-futures/our-research/energy-and-climate-1>

The Victorian government should also consider opportunities for the use of consumer smart meter data, where it can be accessed with the permission of the relevant customers. Alternatively, consideration should be given to whether the data can be de-identified for this purpose.

What are the appropriate time parameters of a study into the potential network benefits of distributed generation?

Time parameters of benefits under consideration need to align with the time parameters the issue the benefit addresses. The time period could be very short (in the order of seconds) for the potential contribution of distributed generation toward frequency control ancillary services, for example. The time period could be of the order of years when considering deferred or avoided augmentation of network assets.

Can you suggest or provide evidence that supports those environmental or social benefits attributed to distributed generation listed in this discussion paper?

Yes. The report of the Black Saturday Bushfire Royal Commission would be a useful source of information regarding the value of bushfire risk mitigation.

The value of avoided impact on amenity or aesthetics will be more difficult to quantify. However it is clear that the avoidance of amenity impacts has a real and tangible cost. The costs of reducing impacts on amenity in other infrastructure projects could be used to impute a monetary value to the benefits of avoided amenity impacts. The Federal Wind Farm Commissioner could be a source of information on amenity impacts of wind farms and the cost of reducing those impacts. This could be one useful source of information for determining the financial value of the benefits of avoided amenity impacts.

Outside those potential benefits listed, are you able to provide (and support with evidence) examples of how distributed generation reduces the environmental impact of the transportation of electricity?

Power lines can affect biodiversity, eg. due to the need for vegetation clearance and subsequent impacts on movement of wildlife. In addition, the introduction of embedded generation tends to deliver power closer to the load and therefore reduces losses incurred in power transfer across the transmission and distribution networks. Reduced losses will lead to lower use of emissions intensive generation in Victoria.

Outside those potential benefits listed, are you able to provide (and support with evidence) examples of how distributed generation provides social benefit, as it relates to the transportation of electricity?

Large transmission investments can massively disrupt local communities, especially in built-up areas. Reduced reliance on the transmission infrastructure and centralised generation will reduce the social impact of transmission investments.

Are there other aspects of the current regulatory framework outlined in this paper that the Commission should consider?

Yes. The review should also consider whether there is a need for mechanisms to enable and reward the use of micro-grids and isolated grids as an alternative to connection to the national interconnected electricity market. Greater use of micro-grids has the potential to reduce costs of transmission and distribution assets. Currently there are significant regulatory barriers and few incentives to greater use of micro-grids.

Can you provide specific examples of payments made to distributed generators under the regulatory mechanisms listed in the discussion paper? What size of distributed generation systems received the payments? Were payments made to small-scale systems?

There are examples of embedded generators providing network support. However the CEC's past work has identified that there are many more examples of proposals from embedded generators being rejected in preference for a traditional network option. Some of these are captured in a recent CEC publication,

<http://fpdi.cleanenergycouncil.org.au/reports/potential-of-embedded-generation.html>).

It does not appear that small scale generation has ever been considered for network support.

Are you able to provide data/evidence about the operation of the small scale generation aggregator framework as a mechanism by which network benefits of small scale distributed generation can be identified, valued and compensated?

Across the entire NEM there are only seven registered generator aggregators and very few registered demand response providers. The use of the aggregator framework for network support is largely untested. However this appears to be a missed opportunity that should be better understood. There are a number of barriers to aggregators entering the market to provide these services and these should be considered by this review.

To what extent do the Tariff Structure Statements published by Victorian distribution businesses provide an indication of the benefit distributed generation can provide through reducing peak network demand?

The Tariff Structure Statements published by Victorian distribution businesses do not appear to provide sufficient detail to enable analysis of the network benefits of distributed generation down to the 11kV feeder level of granularity. Presumably the distribution businesses have data on the long run marginal cost of augmentation at the 11kV feeder level. Provided it can be made public, this data would be a useful input to the process of developing public policy through this review.

Are there alternative conceptual frameworks that could be used to examine the benefits provided by proponent-led distributed generation? In particular, are there conceptual frameworks for considering potential benefits that were not anticipated in the planning forecasts associated with the five yearly pricing determination process?

Consideration should be given to the capability of small scale distributed generation and storage to provide high speed ancillary services like frequency management. The Commission should consider how this can be encouraged through financial incentives for these systems. Doing so will build the capability of the Victorian electricity system to operate on a zero-emissions basis with very high renewable energy contributions.

How should the Commission consider the scope of the LNGC Rule Change Proposal with this current inquiry?

The draft decision is pending on this rule change so it would be premature to comment on how it fits. If the draft decision provides some clarity on the proposed LNGC framework then this should be considered by the Commission.

Are there methodologies for calculating network value and/or regulatory mechanisms from any other jurisdiction that are suitable for consideration in the context of this inquiry?

The Commission should be aware of the CEC's previous work in this area (<http://fpdi.cleanenergycouncil.org.au/reports/value-of-small-scale-generation.html>).