

12 February 2016

Essential Services Commission
Level 37, 2 Lonsdale Street
Melbourne, Victoria 3000



Prof. Stuart White
Director
Institute for Sustainable Futures
University of Technology Sydney
PO Box 123 Broadway
NSW 2007 Australia

Dear Sir/Madam

www.isf.uts.edu.au

RE: Proposed approach to the Inquiry into the true value of distributed generation to Victorian Consumers

UTS CRICOS PROVIDER CODE 00099F

Please find enclosed a submission from the Institute for Sustainable Futures at the University of Technology Sydney on the Commission proposed approach to the Inquiry into the true value of distributed generation to Victorian Consumers. Thank you for the opportunity to make this submission.

Accurate calculation and recognition of the true value of distributed generation is vital to ensuring that efficient investment in distributed generation takes place in the long term interest of consumers. At this dynamic period in the evolution of the electricity system, such measures are vital to ensure our electricity system is fit for the future.

We consider the 'network value' of distributed generation component of this enquiry to be directly complementary to the Local Generation Network Credit (LGNC) rule change under consideration, and the ISF-led research project investigating local network charges and virtual net metering that underpin this proposal. This project has many stakeholders on board, and is due to finish in August 2016. We are happy to share outputs from this work into the Commission's inquiry to work together to determine the optimal outcome for all electricity consumers.

Regards,

A handwritten signature in black ink that reads "Stuart".

Professor Stuart White
Director, Institute for Sustainable Futures



ISF SUBMISSION

COMMISSION'S APPROACH

Q1. Do you agree with how the Commission is proposing to define true value? If not, why not? Are there other definitions the Commission could use?

We agree with the two component streams of value as they are defined, however we note that network benefits of distributed generation can accrue to the *generator* of local energy, or the *purchaser* of that energy. Those entities now or in the future may, or – perhaps more commonly – may not, be the same party. As such, the issue of defining the value of DG should be viewed from the perspective of both a potential buyer and a potential generator.

The Commission states:

"these payment structures should not be viewed as a form of compensation or reward. Rather, they are a vehicle for promoting investment in distributed generation where and when it is needed"

We agree that they should not be viewed as a form of reward, in that the true network value of DG should be reflective of true costs and benefits, and thus be correcting any existing imbalance, rather than providing a reward to DG *per se*.

When viewed from the perspective of a local consumer, the network benefits of DG are equivalent to a reduced use of network infrastructure. As consumers (rather than generators) pay network charges, a customer currently pays the same network charges regardless of whether the electricity they consume is purchased from a generator 100m away or 250km away. This one-size-fits-all charging structure was appropriate when the NEM comprised overwhelmingly of central generators with one way flows to the customer, but is no longer appropriate with substantial amounts of DG in the system. Thus consumers are paying inappropriately high charges for partial service, which will, in the long-term, lead to inefficient outcomes such as duplication of network infrastructure (private wires) and increase load defection (reduction of behind-the-meter consumption).

As such, we encourage the commission to consider the network value of DG not only as a mechanism to promote efficient investment in DG, but also as a mechanism to deliver a reduced network charge for partial usage of the network.

Please refer to Section 1.1 of the attached ISF submission to the LGNC Rule Change process for further discussion of this issue.

In relation to the social benefit of DG (and other customer-led demand side options), we suggest that customer empowerment and control over bills be considered as a key benefit. While difficult to quantify, ISF's [Customer Research Report](#) for the *Smart Grid, Smart City* project demonstrated the value customers place on this factor, and how customer-led options yield increased customer satisfaction.

Q2. Do you agree with the Commission's view that this Inquiry is focussed on identifying the public benefit of distributed generation? If not, why not?

Q3. Do you agree with how the Commission is proposing to define public benefit as it relates to distributed generation?

We agree with the principles of materiality, simplicity and behavioral response. This is entirely consistent with ISF's work on Local Network Charges.



While upon the first impression the private versus public benefit distinction sound appropriate, without clarification as to exactly what would fall in each category, we caution that the distinction has the potential to be somewhat artificial. Economic benefits of DG may accrue to the generating customer, the network business, or all consumers depending on whether generation is behind or in front of the meter, and the structure of network tariffs, which are currently far from cost-reflective. Thus we encourage the Commission to ensure existing network tariff structures do not skew considerations of benefit, and to consider and distinguish between the following perspectives:

- Consumers who use DG exclusively behind-the-meter
- Consumers who use DG part behind-the-meter and partial local grid export
- Non-consuming consumers who use DG exclusively (or near exclusively) for local grid export
- Customers wishing to purchase locally generated DG electricity (even where contractual arrangements do not yet exist in the market). This might include investor members of a community energy group purchasing from a nearby DG facility, or customers wanting to sign a commercial contract with.

Q4. Is the Commission's understanding of how the costs, to network businesses and consumers, of connecting distributed generation are calculated and recovered correct? If not, why not?

Q5. Do you agree with the Commission's proposed approach to the inquiry? If not, why not, and what alternative approach would you propose?

No response.

DEFINITION OF DISTRIBUTED GENERATION

Q6. Do you agree with how the Commission is proposing to define distributed generation? If not, why not?

Q7. Are there other definitions of distributed generation the Commission could consider?

We believe that the restricting the definition to generators under 5MW may incorrectly restrict the scope of the Commission's work. ISF's work defines distributed generation as generation connected to the distribution (including sub transmission) network. Thus an arbitrary size limit is not used. In effect it is highly unlikely that connection of generators much larger than 30 or 50 MW would fit this definition, and in most cases embedded generation will be considerably smaller. However, we do not feel that there is a clear reason at the beginning of the enquiry to limit the scope to 5MW.

We appreciate that distinguishing between generators over and under 5MW has grounding in their treatment in the NER, however we believe that in many cases market registered DG over 5MW may not be credited its true value in many cases.

After consideration of Commission's findings on the true value of these generators, and of the treatment of these generators in the NER, the Commission may be justified in creating a capacity based DG definition for Feed-in Tariff applicability.

We also agree that battery storage should be included within the DG definition.

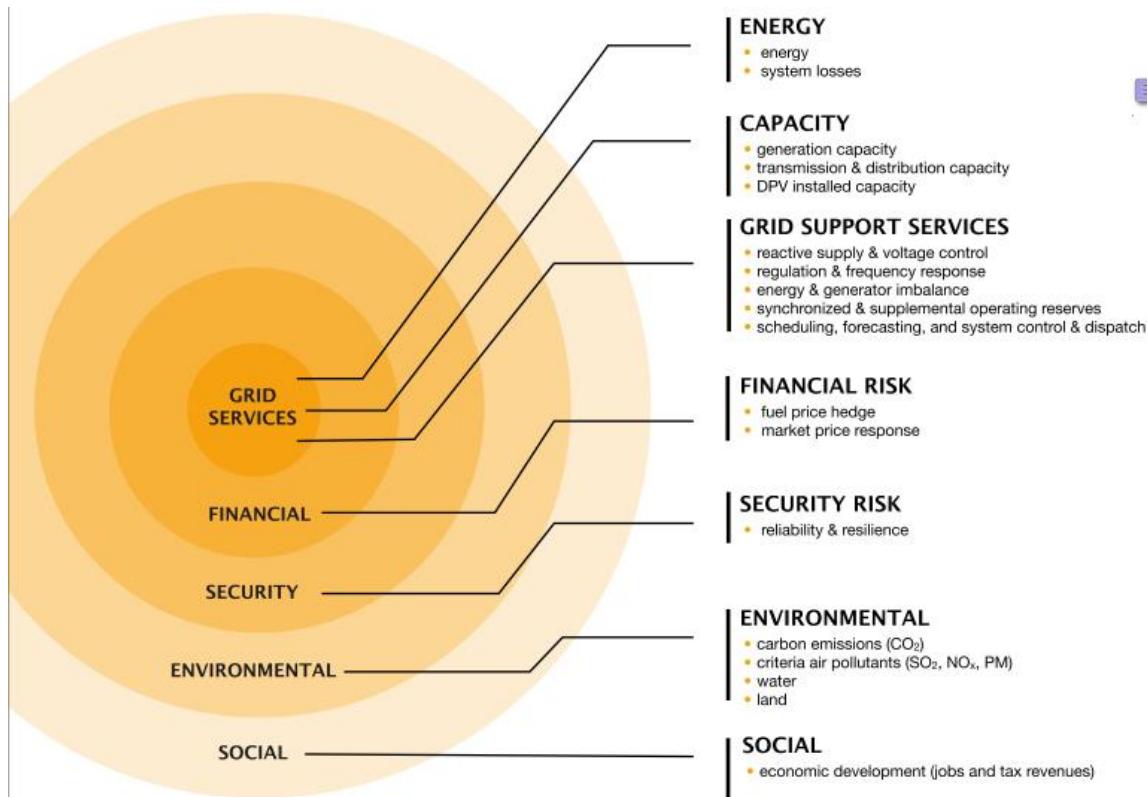


WHAT VALUES CAN BE ATTRIBUTED TO DISTRIBUTED GENERATION

Q8. Are there other public benefits that the electricity generated by a distributed generator provides? How can these identified benefits be quantified?

Q9. Are there any environmental or other public benefits that a distributed generator provides to the distribution network? How can these identified benefits be quantified?

There are numerous benefits of DG beyond those discussed, as outlined by the Rocky Mountains Institute in a solar PV-specific paper



Source: RMI, *A Review of Solar PV Benefit & Cost Studies, 2nd edition*, 2013.

Our approach on the network value of DG has focused solely on the “Energy” and “Capacity” components given difficulty in obtaining data to quantify other components. Some attention to valuing other Grid Services should occur through Small Generator Aggregators in Ancillary Services markets.

There is, however, one crucial addition to the value stream of DG that the Commission must consider, which does not neatly fit into the above categories.

The current charging structure under the NER strongly incentivises behind the meter generation, as such generation avoids all variable network charges as well as the retail components of the energy charge. Once a local generator uses the network – even if between two meter points in the same premises – full network charges are incurred.

This failure in the NER is likely to exacerbate the trend of **declining network utilisation**, and reinforce existing perverse incentives to duplicate infrastructure, where it is more cost effective for new developments to aggregate consumption on private embedded networks behind a single HV metering point. Both impacts would result in higher costs for consumers who do not have access to self-generation options, as **legacy infrastructure**



costs need to be recovered over a smaller consumption base. Through incentivising local exports and thereby maintaining utilisation, appropriately crediting the true network value of DG (such as through a Feed-in Tariff or LGNC) is the only current proposal seriously addressing this major issue. A Feed-in Tariff or LGNC would help to harness the creative force of the market to find ways to utilise the local network to connect customers, rather than to find new ways to go behind the meter.

As part of its work, ISF intends to calculate this value through economic modeling of network future network revenues under a range of future grid development scenarios.

Refer to Section 1.2 of ISF's attached LGNC submission for more detail.

REGULATORY FRAMEWORK

Q10. Are there other aspects of the current regulatory framework outlined in this paper that the Commission should consider when evaluating the adequacy of the current Victorian policy and regulatory frameworks governing the remuneration of distributed generation

Q11. What is the impact of the current regulatory framework on the valuation of distributed generation in Victoria? In particular, what has been the scale and scope of support provided to distributed generators by: avoided TUOS payments, avoided DUOS payments, Network Support Payments, the Distribution Network Pricing and Assessment Framework, and the RIT-D?

This is the comprehensive focus of **Section 2 of ISF's attached LGNC submission, in the context of NER provisions** (rather than Victorian specific provisions). Please review this response.

Q11 mentions Avoided DUOS payments. We are not aware of the existence of Avoided DUOS payments, and this is essentially what the LGNC seeks to provide (a combined avoided TUOS and avoided DUOS payment). This is consistent with the dual framing of the issue as one of appropriately crediting the network value of DG, and of appropriately charging for partial use of the network (as per response to Q1).

KEY ISSUES FOR THE INQUIRY

Q12. Do you agree with the Commission's proposal to develop a methodology for calculating the time-of-use benefit of the electricity produced by a distributed generator? If not, why not?

Yes, we believe that a cost reflective export signal for DG is required on a time of generation basis. While not a focus of the ISF Local Network Charges work (as we exclusively focus on export value), Reforms to network tariff structures should also be closely reviewed to ensure that behind the meter generation is not unfairly targeted with fixed cost tariff structures.

Q13. Which of the two time-of-use options presented do you favour?

Q14. Are there other time-of-use options that the Commission could consider?

Q15. Are there other methodologies for calculating the locational benefit of distributed generation?

We favour option 1, as the timing of generation is just as crucial to the network value of DG as the energy value of DG. Upper levels of the network will correspond closely to the energy market peak period, but lower levels of the network may not, due to load diversity and customer types in different parts of the network. The energy and network values of DG may be calculated separately and summed into a combined TOU value.



However, the mechanism by which ISF strongly prefers to deliver the network value of DG, is through mandating that network businesses create dedicated tariff class/es for DG to credit exports on a TOU basis. SP Ausnet has a precedent for doing so in its existing customer tariffs for PV generators.

This would enable a consistent approach to be taken across the NEM and is the approach suggested in the LGNC Rule Change. **ISF strongly encourages the Commission to direct its attention and efforts towards working with the AEMC's LGNC Rule Change to deliver a NEM-wide outcome**, and capitalise on the substantial amount of work done to deliver an equivalent result. This would be a superior outcome for developing DG businesses that work across jurisdictions as the market matures.

The Energy value of DG could still be mandated under the Victorian Feed-in Tariff regulation and DG customers would receive both value streams.

As noted in the document, ISF has developed a draft methodology to value DG, which is to be finalized in June 2016 and will feed into the LGNC Rule Change process. We are happy to share the draft and final method with the Commission.

Q18. Do you agree with the Commission's proposal to undertake further analysis into the economic benefit of distributed generation to distribution networks? If not, why not?

Yes this is a vital economic benefit that requires substantial attention and is far from straight forward.

Q19. Do you agree with the proposal to focus this analysis on the three pieces of analysis highlighted? If not, why not?

Yes we agree that the major pieces are captured, although note that while the 2016 - 2020 Regulatory Determinations and Tariff Structure Statements published by the Victorian distribution businesses are crucial, the time horizon for calculation of true network value should be a least 20 years, rather than 1 regulatory period (see Section 1.3 of ISF's attached LGNC submission).

Q20. Is there other analysis that might be helpful to the Commission in considering the economic benefit of distributed generation to distribution networks?

ISF has done a substantial literature review in the development of its proposed methodology and is happy to provide reference list to the Commission. Naturally we would encourage the Commission to as best as possible build on ISF's work rather than repeat it.

