

2 November 2018

Submissions

Electricity Authority  
PO Box 10041  
Wellington 6143

*by email: [submissions@ea.govt.nz](mailto:submissions@ea.govt.nz)*

**Submission on issues paper- Integrating hosting capacity into Part 6 of the Code on low voltage networks**

1. Orion New Zealand Limited (Orion) welcomes the opportunity to comment on the Electricity Authority's (the Authority) consultation paper (the paper) on integrating hosting capacity into Part 6 of the Code on low voltage networks.
  - a. Our submission covers our response to your specific questions.

**Concluding remarks**

2. Thank you for the opportunity to make this submission. We do not consider that any part of this submission is confidential. If you have any questions please contact Dayle Parris (Regulatory Manager), DDI 03 363 9874, email [dayle.parris@oriongroup.co.nz](mailto:dayle.parris@oriongroup.co.nz).

Yours sincerely



Dayle Parris  
**Regulatory Manager**

## Appendix A- Response to Questions

Question	Response
<p>Q1. Have we adequately outlined the issues with increasing levels of SSDG, particularly inverter-connected solar PV systems?</p>	<p>Yes, we agree with the issues covered. In addition we propose that the requirement for import/export metering should be compulsory. A nation-wide approach in this area will create a standard more cost effective solution for customers as DG and EV penetration increases. This will also ensure correct reconciliation in the market.</p>
<p>Q2. What other factors are relevant to these technical network considerations?</p>	<p><u>Solar PV diversity</u>            Even when the total installed solar PV are small clustering is still possible causing localised issues (e.g. new subdivisions, high uptake in a particular street or area). This is most likely to affect our low voltage system.</p> <p>All solar PV in an area is likely to generate (or not) at the same time (e.g. when the sun’s shining). In other words not much diversity. If most inverters react in the same way, then that’s also against diversity. Both are not ideal. Batteries could either alleviate or reinforce this.</p> <p><u>Inverter settings</u>            Orion has advice that suggests that EDBs are at risk of becoming part of the installation design with liabilities where we specify inverter settings. If the Code specified a set of default inverter settings under AS/NZS 4777 appropriate for the New Zealand environment (i.e. off the shelf compliant) this would improve efficiency in the application process for customers and reduce EDB exposure in this area.</p>
<p>Q3. Do you agree these options broadly represent the range of actions we could consider at this time? Are there other broad conceptual options we should consider that are not covered by these three</p>	<p>Yes. We believe the three options represent a pragmatic representation of the options available.</p>

approaches?	
Q4. Do you think the Authority should pursue the types of measures that Option B would require? If not, please outline your alternative preferred approach, including if possible the costs and benefits. If you consider there is a valid Option C-style alternative, please provide details, including your view on how your alternative would meet the Authority's statutory objective.	Yes subject to our response to Question 2.0.
Q5. Do you have any comments on the draft EEA guide's stated objectives?	<p>The guide does represent a more equitable way to allocate available capacity to consumers. Working closely with installers we have found that application of AS/NZS4777 limiting 5kW per phase has shown to be a suitable solution for the distributor and installer. Installation compliant export limiting inverter devices are a satisfactory way of limiting export for PV installs above 5kW.</p> <p>New Zealand standard inverter protection systems that incorporate network stability and voltage control and meet AS/NZS4777 adequately covers Network requirements.</p>
Q6. What advanced power quality capabilities do inverters sold into the New Zealand market possess?	<p>A list of AS 4777 and AS/NZS 4777.2:2015 <a href="#">compliant inverters</a> that are pre-approved for connection to Orion's network is available on our website.</p> <p>AS/NZS4777 compliant inverters have all the required power quality capabilities for New Zealand.</p>
Q7. Is it reasonable to assume that the advanced power quality modes outlined are currently available in the marketplace at no additional cost? If not, what are the likely incremental costs involved to obtain these modes?	Yes the power quality modes outlined are currently available in the marketplace for inverters compliant to AS/NZS4777. Installers generally determine which compliant inverter is used for the customer.
Q8. Would a default requirement to provide volt-var and volt-watt	Unintended consequences of a default requirement for volt-var and volt-watt

<p>modes for all future inverter installations that use the Part 1A connection process have any unintended adverse consequences (for example, leaving a stock of unsold inverters that are otherwise compliant with the superseded AS4777:2005 standard suite)? Are these adverse consequences surmountable?</p>	<p>modes for inverters include:</p> <ul style="list-style-type: none"> <li>a) When AS/NZS4777 is cited in NZ the change will take into account old stock (introduction of new inverters over a time period) 1A or any code change may be irrelevant to the new standard i.e. 1As pathway will become irrelevant over time.</li> <li>b) A code change to define default settings for inverters will have the benefit of removing EDBs from becoming part of design at the installation.</li> </ul>
<p>Q9. What comments do you have about the hosting capacity assessment process described in detail in the draft EEA guide?</p>	<p>Positives of the hosting capacity assessment process include:</p> <ul style="list-style-type: none"> <li>(a) Visibility for eminent network issues that may require planning and expenditure</li> <li>(b) A high percentage of connections will be able to be accommodated with confidence without additional network review</li> <li>(c) Modelling can be refined over time as practical experience and knowledge increases</li> </ul> <p>Negatives of the hosting capacity assessment process include:</p> <ul style="list-style-type: none"> <li>(a) Expenditure may still be required on low voltage network in time i.e. network reinforcement can be deferred but not necessarily avoided depending on the extent of localised penetration</li> <li>(b) The process is reasonably complex</li> <li>(c) A guide can evolve and be updated using learnings from practical application more easily than a regulation or act</li> </ul>
<p>Q10. Do you support the Code amendment request discussed in the draft EEA guide? If not, please explain why and, if possible, suggest an alternative approach.</p>	<p>Yes we support Code amendment in respect of Part 1A applications for:</p> <ul style="list-style-type: none"> <li>(a) Inverters with power quality modes that enable local voltage regulation</li> <li>(b) A distributor published threshold limit for maximum export power</li> </ul>

	<p>An earlier rather than later citing of AS/NZS 4777.2 under Clause 1D of Schedule 6.1 would support.</p>
<p>Q11. Do you think there is a problem or conflict with the '10 kW total' versus '5 kW per phase' thresholds respectively adopted in the Code and AS/NZS 4777.2:2015? If so, would you support aligning the Code threshold with the inverter standard?</p>	<p>We support the idea of aligning the Code with the AS/NZS 4777.2:2015: that is updating the Code to a 5kW per phase terminology.</p>
<p>Q12. Do you think there are emerging problems with capacity or power quality from in-home electric vehicle chargers, or is it too early to tell? We are keen to hear industry views and experiences and from parties that supply electric vehicle charging equipment.</p>	<p>As the uptake of electric vehicles increases it is realistic to assume that capacity and power quality issues will emerge. Initially this will be at local level (clustering) before becoming more widespread across a network. Orion plans to implement a project to use transformer feeder monitoring devices and data from customer meters to develop an accurate model that will identify network issues in advance.</p> <p>However, in any area where one is trying to predict the future it would be imprudent to rely on one method and assume that that one method will solve all issues/scenarios going forward.</p> <p>Therefore we consider it pre-emptive and prudent to bring in the requirement for a process for connection of electric vehicle chargers under Part 6. Taking this no regrets approach may potentially work alongside monitoring efforts to head-off any connection technical issues, but it may also help facilitate competitive retail offerings to customers in the future.</p> <p>For instance, if EV charger connections were publicly disclosed, retailers may be able to use this information to target specific price offerings to EV drivers. Relevant information would be available (potentially via the registry) for when markets for services using distributed generation including EVs develops. Such targeted price offerings may enable more customers to offer up EV charging</p>

for load management purposes, thereby reducing the need for grid/generation upgrade and improve the countries decarbonisation efforts, and save the customer money. A further benefit for networks will be in visibility of a generation feed-in location (vehicle-to-grid V2G) from a worker safety perspective.

We note that Vector's paper did not adequately explore the benefits of EV charger management to facilitate diversity of electric vehicle charging. There are a number of other papers available that should be considered in this discussion such as the Concept Consulting paper<sup>1</sup> prepared for Orion, Unison and Powerco, and the Wellington Electricity report on Electric Vehicle Charging Trial<sup>2</sup>

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<sup>1</sup> Driving change- issues and options to maximise the opportunities from large-scale electric vehicle uptake in NZ- 7 March 2018- [www.concept.co.nz/uploads/2/5/5/4/25542442/ev\\_study\\_v1.0.pdf](http://www.concept.co.nz/uploads/2/5/5/4/25542442/ev_study_v1.0.pdf)

<sup>2</sup> Electric vehicle charging July 2018- <https://www.wellectricity.co.nz/dmsdocument/153>

