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3 December 2019

Submissions  
Electricity Authority  
Level 7, Harbour Tower  
2 Hunter Street  
Wellington

By email: [Part6hosting.submissions@ea.govt.nz](mailto:Part6hosting.submissions@ea.govt.nz)

**Powerco submission on *Integrating hosting capacity into small-scale distributed generation connections (October 2019)***

Powerco appreciates the opportunity to comment on the Electricity Authority's Consultation Paper. As consumer use of small-scale distributed generation (SSDG) and other emerging technologies increases over time, our role as an electricity distributor will be to ensure our network can adapt to this need cost effectively while maintaining safety and reliability.

The Authority's proposals are consistent with an open-access objective because enhancing the hosting capacity of electricity networks will allow more consumers to connect distributed energy resources while also maintaining safety, voltage quality and reliable supply. The implications of increased SSDG concentration on networks will materialise over the next five to ten years as SSDG use increases.

The industry is at the start of this journey so we have included forward-looking comments in our responses so that the Authority can consider these as it develops its 'open networks' work stream (including the potential relationship with economic regulation). Powerco has begun thinking about what we will need to plan for towards the end of the next decade – transitioning to an open access network is a core driver of this plan<sup>1</sup>.

Our position on the Authority's proposals is:

- **Support** the Authority's objective to cost-effectively enhance the hosting capacity of electricity networks
- **Support** incentivising the use of Volt-VAR and Volt-Watt capable inverters by amending the eligibility criteria for the Part 1A application process
- **Positive net benefit** from implementing the proposed amendments

Attachment 1 comments on the Authority's questions. If you have any questions on this submission, please contact Nathan Hill ([Nathan.Hill@powerco.co.nz](mailto:Nathan.Hill@powerco.co.nz)).

Yours sincerely

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<sup>1</sup> Powerco, Summary Asset Management Plan 2019, p.35

A handwritten signature in black ink, appearing to be 'AK' with a stylized flourish.

Andrew Kerr  
Regulatory and Pricing Strategy Manager

## Attachment 1: Powerco's response to questions

Question No	Question	Powerco response
Q1.	<b>Do you agree the issues identified by the Authority? If not, why not?</b>	<p>Yes – we agree with the issues identified by the Authority.</p> <p>We anticipate that issues will materialise over time as SSDG use becomes more prevalent. Some of the issues we foresee are:</p> <ul style="list-style-type: none"> <li>• SSDG is likely to increase short-term power fluctuations as intermittent generation replaces dispatched generation. This can affect network stability and could constrain further small-scale connections. We expect low voltage networks to be highly affected.</li> <li>• Hosting capacity estimates will be inaccurate for networks with low quality and quantity of low voltage load data. This will become a material problem as penetration levels increase and existing estimation methodologies are maintained. Our response to this is planning for significant investment to achieve the basics of an open access network. This will initially focus on additional monitoring and limited automation on our network, particularly on the Low Voltage (LV) side. The consequence of increased SSDG penetration is the incremental cost to enhance the network to accommodate it.</li> <li>• Underground sections of networks may experience congestion issues because the Volt-VAR mode has a limited ability to constrain voltage in an underground network.</li> <li>• Consumers using batteries to draw down power may introduce significant additional net load (similar to an EV charger). This will have flow-on effects to transmission and distribution pricing, and the value of controlling that load.</li> <li>• With regulations restricting the ability of distributors to develop fixed/capacity-based charges, consumption-based charges (eg c/kWh) continue to punch above their weight as a tool for recovering cost. Total costs to consumers who don't use new technologies could rise as small-scale generation reduces electricity consumption but don't reduce network costs.</li> </ul> <p>The outcome we are seeking is that the Authority considers and monitors these sorts of issues in its 'open networks' work stream. Further Code changes may mitigate problems before they arise.</p>

Q2.	<b>Do you agree with the proposals identified by the Authority? If not, why not?</b>	Yes – we agree with the Authority’s proposals.
Q3.	<b>Do you agree with the objectives of the proposed amendment? If not, why not?</b>	Yes – we agree with the objectives of the proposed amendment.
Q4.	<b>Do you agree the benefits of the proposed amendment outweigh its costs? If you don’t agree, please explain your reasons.</b>	<p>Our qualitative assessment is that the benefits of the proposed amendments (enhanced hosting capacity and deferral of network investment) will outweigh the costs that might accrue to the industry. However, we consider that this outcome is somewhat uncertain because:</p> <ul style="list-style-type: none"> <li>▪ The longer-term impacts of volt response modes are not well understood. For example: <ul style="list-style-type: none"> <li>○ The additional reactive power flow that is generated by the use of Volt-VAR will increase losses and may eventually require an entire re-think about the management of reactive power.</li> <li>○ If optimising reactive flows across all network voltages is required, it will be a high cost exercise due to its complexity. It will require significant investment by distributors in real time data, modern communication systems and sophisticated backend analytics.</li> </ul> </li> <li>• As SSDG use increases and the Volt-Watt mode is triggered more frequently, more energy will be lost</li> </ul>
Q5.	<b>Do you agree the proposed amendment is preferable to the other options? If you disagree, please explain your preferred option in terms consistent with the Authority’s statutory objective in section 15 of</b>	Yes – we agree the proposed amendment is preferable to the other options.

	<b>the Electricity Industry Act 2010.</b>	
Q6.	<b>Do you agree the Authority's proposed amendment complies with section 32(1) of the Act? If you don't agree, please explain your reasons.</b>	Yes – we agree the proposed amendment complies with section 32(1) of the Act.

Q.7	<p><b>Do you agree with the drafting of the proposed amendment? If not, why not?</b></p>	<p>We recommend the following two changes to the drafting of the proposed amendment.</p> <ol style="list-style-type: none"> <li>1. We suggest that the Authority amend the drafting of section 6.3 of Part 6 to remove the requirement for distributors to publish a list of the 'makes and models' of inverters that it has approved for connection to its network. Why? We don't have the capability to check all, or even some, of the inverters on the market. As an alternative, we think the requirement could be changed so that the distributor can list the specifications around safety and the required control features instead. Or distributors could point to a common list hosted on a website. For example, Powerco currently approves inverters listed as compliant on the Australian Clean Energy Council's website.</li> <li>2. We suggest the Authority change clause 1D of Schedule 6.1 as follows;</li> </ol> <p><b>Part 6 Schedule 6.1</b></p> <p><b>1D When application may be made under Part 1A</b></p> <p>A <b>distributed generator</b> may elect to apply to a <b>distributor</b> under Part 1A instead of Part 1 if the <b>distributed generation</b> to which the application relates—</p> <p>(a) is designed and installed in accordance with AS/NZS 4777.1:2016 and</p> <p>(b) incorporates an inverter that—</p> <p>(i) has been tested and issued a Declaration of Conformity with AS/NZS 4777.2:2015 by a laboratory with accreditation issued or recognised by International Accreditation New Zealand; and</p> <p>(ii) has the following volt response modes:</p> <p>(A) volt-watt response mode; and</p> <p>(B) volt-var response mode; and</p> <p>(iii) has protection, <u>control</u> and volt response mode settings that meet the <b>distributor's connection and operation standards</b>; and</p> <p>(c) has an export power limit at the ICP of the <b>distributed generator</b> that meets the <b>maximum export power</b>, if any, specified by the <b>distributor</b> in its <b>connection and operation standards</b>.</p>
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