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Electricity Authority  
Level 7, ASB Bank Tower  
2 Hunter Street  
Wellington

VECTOR LIMITED  
101 CARLTON GORE ROAD  
PO BOX 99882  
AUCKLAND 1149  
NEW ZEALAND  
+64 9 978 7788 / VECTOR.CO.NZ

## Submission on Integrating Hosting Capacity into Part 6 of the Code on Low Voltage Networks

### Introduction

1. This is Vector Limited's (Vector) submission on the Electricity Authority's (the Authority) issues paper on *Integrating hosting capacity into Part 6 of the Code on low voltage networks* (the Issues Paper), dated 4 September 2018.
2. Vector generally supports initiatives that promote the use of the latest technical standards, including standards for inverters for small-scale distributed generation (SSDG). In our view, the latest SSDG inverter standards should be adopted in a manner that would enable greater uptake of new technologies and mass participation in electricity markets, while maintaining network integrity and safety.
3. As a leading technology solutions company, Vector will continue to explore the practical applications of relatively untested technologies to deliver improved services to energy consumers. We can do this more effectively where the process of adopting advanced standards is not stifled by highly prescriptive rules and regulations.
4. We set out below our responses to the questions in the Issues Paper.
5. No part of this submission is confidential. Vector's contact person for this submission is:

Luz Rose  
Senior Regulatory Specialist  
[Luz.Rose@vector.co.nz](mailto:Luz.Rose@vector.co.nz)  
Tel: 04 803 9051

### Responses to consultation questions

Q1: *Have we adequately outlined the issues with increasing levels of SSDG, particularly inverter-connected solar PV systems?*

Q2: *What other factors are relevant to these technical network considerations?*

6. Yes, Vector believes the Issues Paper has adequately outlined the issues associated with increasing levels of SSDG (with capacities of up to 10 kilowatts), including inverter-connected solar PV systems. However, we have concerns with the Authority's options which all appear to involve the codification – now or in the near future – of technical standards for new technologies in the *Electricity Industry Participation Code 2010* (the Code).
7. We suggest that the Authority widen its lens on how suitable SSDG inverter standards, and standards for other new technologies, may be adopted in a way that would not become barriers to new connections that enable market entry and innovation.

8. The Authority itself states that “restricting the use of new technologies is a recipe for inefficiency”, further stating that:

A distributor could...impos[e]...restrictions, such as quotas on the number of new technologies (EVs, PV and batteries) that can connect to the network, or other restrictions on how and when they can be operated. But quantity and similar types of restrictions are a recipe for inefficiency. They are unlikely to be acceptable to the public or to the Government – which has strongly signalled its desire for New Zealand to transition to a low-carbon economy.<sup>1</sup>

9. We discuss our view below.

*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 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.*

10. Vector views the options outlined in the Issues Paper to be too prescriptive and too Code-centric in the context of rapidly evolving energy technologies and markets. The options appear to suggest that the adoption of advanced technical standards necessarily requires enshrining these standards in the Code, i.e. embedded in the regulatory framework.

11. We believe that prescribing more advanced SSDG standards, and other technical standards more generally, that enable the introduction of new technologies deserves to be considered in a wider context.

### ***The limits of mandating/codifying technical standards***

12. Any new requirements relating to the introduction of new technologies should provide the right incentives to accelerate their introduction and enhance, rather than diminish, incentives for innovation and investment. The rapid evolution of energy technologies and markets makes it more important for new technologies to be tested or installed to meet the changing requirements of the industry and consumers, rather than dissuaded through prescriptive rules. In dynamic markets, the uptake of, or transition to, new technologies is driven by consumer choice, rather than by regulation.

13. Mandating or codifying (i.e. embedding into the Code) technical standards for new technologies imposes the following limits:

- a. Market competition is limited by locking out existing and potential market participants who are not currently using the required standards or who believe that better standards/approaches are available, or could become available. This effectively becomes a barrier to market entry, stifling competition.
- b. Where barriers to entry are created, consumers will not benefit from lower cost service provision or the choice of better services that meet their specific needs.
- c. Mandated technical standards do not provide strong incentives for market participants to rapidly introduce new technologies that enable the delivery of innovative services to the market. It makes them regulator/regulation-focused instead of becoming effective

<sup>1</sup> <https://www.ea.govt.nz/development/work-programme/pricing-cost-allocation/distribution-pricing-review/correspondence-2/pre-consultation-paper-for-distribution-companies/>, page 4

competitors and innovators that strive to meet consumer requirements and expectations.

- d. Mandating particular standards before they are used creates the risk of 'gold-plating' the service. This generates unnecessary costs for consumers who do not want or need some functionalities.
- e. New functionalities in future years may not be able to be delivered using today's technology. It would not benefit consumers if market participants do not have ample flexibility to upgrade or alter technical specifications in a timely manner. This could lead to outcomes where the delivery of services is not keeping pace with technological changes or what consumers value.
- f. Mandating technical standards is likely to increase the regulatory burden, which increases costs for consumers. Introducing Code changes in response to shorter technology life cycles requires substantial resources and takes time (usually years). In addition, the role of regulators in monitoring compliance of any new requirements and addressing industry disputes, some of which could have been previously resolved through contractual means, is expected to expand.

### ***More flexible approaches***

14. Vector suggests that the Authority cast a wider lens so it can consider approaches that would minimise, if not avoid, the above limitations. Less prescriptive approaches that do not involve embedding technical standards or technical specifications/functionalities into the Code, without compromising network integrity and safety, could include any or a combination of the following:
  - a. commercial arrangements;
  - b. industry initiated arrangements, e.g. development of principles or guidelines through the appropriate industry bodies;
  - c. development of standards through Standards New Zealand, in conjunction with industry participants, and possibly informed by the Electricity Engineers' Association (EEA) guide which informed the Authority's Issues Paper;
  - d. development of guidelines by an independent body or group of experts;
  - e. codification of principles or minimum service levels that benefit consumers, instead of technical standards or functional specifications;
  - f. education campaign by the Authority and/or distributors themselves; and
  - g. innovative and flexible approaches adopted in other New Zealand industries or similar jurisdictions overseas.
15. It is our view that regulators should focus on removing barriers to the introduction of new technologies and services, to promote innovation. Instead of imposing prescriptive rules, regulators should create an environment that enables innovation to flourish (including developing safer products and services) and commercial solutions to be developed.
16. We cannot over-emphasise the importance of enabling innovation for the benefit of consumers. The New Zealand Commerce Commission recognises the primary importance of considering innovation in making regulatory decisions:

...where a tension exists between short-term allocative efficiency and long-term dynamic efficiency, the Commission will give greater weight to the latter... **Ongoing innovation and efficient investment over time can deliver significant long-term benefits to end-users, and the adverse consequences of deterring or delaying such investment may be substantial.**<sup>2</sup>

[emphasis added]

Q5: *Do you have any comments on the draft EEA guide's stated objectives?*

Q6: *What advanced power quality capabilities do inverters sold into the New Zealand market possess?*

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?*

Q8: *Would a default requirement to provide volt-var and volt-watt 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?*

17. See our responses to Q1-Q2 and Q3-Q4.

18. While supporting the promotion of more advanced technical standards supplanting old standards, but not through highly prescriptive approaches, we are not making any judgement as to the suitability of specific technical standards. The standards of choice at present may not be the most suitable or least costly in the future. "The risk is in the future, not in the past."

19. In response to Q8, we recognise the hosting capacity advantages of standardised (pre-configured default) Volt-Var and Volt-Power inverter settings for existing and future parties seeking connection to the distribution network. This makes it easy for installers to install pre-configured equipment, reducing the risk of them getting the configuration wrong. As indicated above, we prefer more flexible approaches to the adoption of advanced standards for SSDG and other new technologies (other than codifying them) for innovation reasons.

Q9: *What comments do you have about the hosting capacity assessment process described in detail in the draft EEA guide?*

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?*

20. See our responses to Q1-Q2 and Q3-Q4. As reflected in those responses, Vector is not inclined to support a prescriptive approach to the adoption of SSDG technical standards by embedding those standards into the Code. We suggest more flexible alternative approaches in our response to Q3-Q4, which could involve the EEA guide informing those approaches.

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 the Authority aligning the Code threshold with the inverter standard?*

21. Vector supports the adoption of the '5 kW per phase' thresholds. This will enable networks to better manage the devices that can be hosted on their network at any one time.

<sup>2</sup> Commerce Commission (2009). *Discussion Paper on Guide to Regulatory Decision Making for the Telecommunications Sector*, Wellington, pages 27-28.

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.*

22. We refer the Authority to Vector's Green Paper on *EV Network Integration* published in March 2018.<sup>3</sup> The Green Paper represents Vector's contribution to the evolving discussion around EVs in New Zealand. It identifies options that the Government and industry can consider in the transition to high EV penetration to minimise significant infrastructure investment and costs on consumers.
23. We are happy to further discuss the Green Paper with the Authority to inform its ongoing work around EVs and other new technologies, and how these technologies can enable mass participation in electricity markets.
24. In relation to inverters, we note that Germany has already made modifications to all new solar inverters to reduce active power or enable remote-controlled reduction of the feed-in power.<sup>4</sup>

### **Concluding comment**

25. We are happy to discuss with the Authority any aspects of this submission, and share our experience and insights from our new technology offerings such as solar PV, EV charging services, and home energy management solutions.

Yours sincerely  
For and on behalf of Vector Limited

A handwritten signature in blue ink, appearing to read "Richard Sharp".

**Richard Sharp**  
Head of Regulatory and Pricing

<sup>3</sup> See [www.vector.co.nz/articles/ev-network-integration](http://www.vector.co.nz/articles/ev-network-integration).

<sup>4</sup> See [http://www.sunwindenergy.com/system/files/SWE\\_0212\\_086-091\\_PV\\_Inverter\\_market\\_Modification.pdf](http://www.sunwindenergy.com/system/files/SWE_0212_086-091_PV_Inverter_market_Modification.pdf).