



8 April 2022

Transpower Ltd
22 Boulcott Street
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Re: Implementation of Renewable Energy Zones (REZ) in New Zealand

Tesla Consultants is committed to collaborating with local stakeholders in New Zealand to reach 100% renewable energy use, and offers a range grid connection, distribution and transmission engineering services to facilitate the connection of new generation.

Tesla Consultants broadly supports the adoption and implementation of Renewable Energy Zones in New Zealand, as a mechanism to rapidly increase the proportion of renewable energy supply.

There is much insight to be gained from recent development activity in Australia, which should be considered when developing connection policy and procedures, to reduce the probability of grid activities becoming a bottleneck. Based on our experience with grid-connected generation projects in the Australian market, Tesla Consultants offers the following preliminary high-level feedback with regards to REZ implementation in New Zealand:

- 1) **Co-ordination of generating systems within the REZ is essential to ensure the correct operation of the grid.** A well thought out strategy is required to reduce the likelihood of grid connection studies being reset each time there is a change to the prospective generators within the REZ.

Potentially, this may be achieved by engaging an external entity to take responsibility for demonstrating grid compliance of the entire REZ over its lifetime, from initial application to ongoing monitoring. Special protection schemes, and co-ordination of voltage and frequency control within the REZ will be more straight-forward when co-ordinated across the REZ. This also facilitates more complex modelling of potential interactions between generators, and leveraging advancements in new technology, as it arises.

- 2) **Review the technical requirements at the interface points.** Interfaces exist between the REZ and the transmission network, and at the points of connection to individual generating systems. If the REZ is co-ordinated as a single entity, then there may be opportunity to reduce the responsibilities on the individual generating systems, (i.e. the default requirement to provide a given reactive

range/provide a specific response may be removed, provided it can be met by the REZ).

- 3) **Clarify process to address system strength, or power quality issues, when they arise.** A clear process and funding mechanism will help give certainty to any prospective generator in terms of their ongoing costs. The goals of this exercise would be as follows:
- a. Addressing issues collectively, rather than individually, to avoid duplication of investment.
 - b. Developing a timeline/threshold for additional investment, to reduce upfront costs during commissioning.

As the algorithms controlling inverter-based resources are rapidly advancing, it is worthwhile to defer additional investment related to system strength and power quality for as long as possible, to reduce the likelihood of it becoming a stranded asset. The risk of this approach can be reduced by investigating a standard design for augmentation equipment, allowance of space at the REZ point of connection, and by the collection of comprehensive power quality data over the operational lifetime of the REZ, so the drivers for such investment can be properly investigated.

Yours Sincerely,



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