

solarZero Submission: Net Zero Grid Pathways 1

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Introduction – about solarZero

solarZero has nearly 9000 solar and battery systems in the New Zealand market. We monitor these every 5 minutes and can control the batteries, hot water and in future other main household loads such as EV charging. We aim to be a participant in the reserves market shortly. Panasonic is our technology partner. By the end of 2022 we expect to have a peak capacity of around 40MW around Aotearoa/New Zealand and by end 2023 a peak capacity of 60MW at our current installation ramp rate. This capacity is highly controllable in space and time. There is the potential to increase this ramp rate via funding for non-transmission solutions.

Whakamana i Te Mauri Hiko and Transpower leadership

The Net Zero Grid Pathways work provides an opportunity for Transpower to put into practice the leadership Transpower has identified in the Te Mauri Hiko series of reports. The Te Mauri Hiko work set out an exciting and compelling integrated vision for the power system, decarbonisation and the electrification of the economy. The Grid Zero report appears to focus mainly on one aspect of the Te Mauri Hiko work – the significant increase in demand. The Te Mauri Hiko work covers a range of areas that are relevant to the Grid Zero work, in particular the concept of a smart power system where peak demand is actively managed. We suggest that the Grid Zero work should better reflect the wider vision set out in the Te Mauri Hiko work.

Key recommendation

Our overarching recommendation is that Transpower commissions a comprehensive piece of analysis on ways to reduce peak demand and the economics of doing so, to enable new transmission investment to be deferred. This analysis should look at the opportunities for using distributed energy resources and demand response, the full suite of barriers to maximising their potential and ways to overcome these barriers.

For example, the Net Zero Grid Pathways document states that *“Market participants will decide if providing or purchasing higher reserves to enable an unbalanced HVDC mode is economic”* which assumes that there are no major regulatory or similar barriers to participants providing different types of reserves. We challenge this assumption and hence we recommend analysis on the barriers that new entrants with new technologies face. Examples of barriers include:

- Legacy provisions in the Electricity Code may not enable new technologies because the Code is largely written in a way that identifies specific existing technologies.
- Very specific aspects of the Code such as metering requirements that can result in constraining distributed energy and new technology providers from fully participating in markets.
- Upgrades needed to SPD to handle new forms of generation and reserves.

This analysis of the barriers to enabling distributed resources would build on the experience Transpower has gained in the demand response area, support the upcoming dispatchable demand

aspect of the wholesale electricity market and the Future Stability and Resilience work. These workstreams touch on the Electricity Authority's role, so the EA should be involved also. Such a piece of analysis we believe would put Transpower in a world leading position on non-network solutions and would give effect to the direction set out in the Te Mauri Hiko work.

Transmission pricing

It is unclear from the Net Zero Grid Pathways report how the new transmission pricing methodology will play out in practice. It is not clear how participants will see the pricing should the investment go ahead and therefore what participants' responses might be is unclear.

Answers to questions

1. Do you agree with this staged approach to this major capital investment programme?

A staged approach is correct and at each stage the forward plan should be reviewed to identify whether there are better ways of achieving the outcomes Transpower wishes to achieve in an environment of rapidly evolving technology.

2. Is our approach to non-transmission solutions reasonable?

As outlined in the introduction to this submission we think Transpower should investigate, in detail, the potential of non-transmission solutions and the barriers to the potential being realised. This work should build on the pilot demand response programme, involve industry participants and draw on overseas experience. Electricity market rules may constrain the participation of various new technologies and the rules may need changing to enable new technologies. If Transpower is serious about seeking non-transmission it needs to ensure that all the rules, regulations and relevant software support the technology providing non-network solutions.

3. Is our reduced list of options for enhancing the capacity of the HVDC reasonable?

It is difficult to see the need for enhancing the capacity of the HVDC at this point in time if the smelter stays. Even if the smelter goes, there are plans for other energy intensive industries in Southland being discussed.

We acknowledge that reserves in the North Island can be an issue and appear to limit the HVDC to around 900MW. The short term solutions would seem to be to enable more reserves rather than invest tens of millions of dollars on upgrading the HVDC. Enabling additional reserves requires careful analysis as to the barriers and this kind of analysis may lie outside the scope of this project, in areas such as the Electricity Code or local connection requirements. Nevertheless, as part of this project Transpower should be asking the question around ways to increase reserves to support the HVDC, if Transpower considers the provision of reserves to be an issue (implied on page 34 of the Net Zero Grid Pathways consultation document).

9. Is our choice of preferred option reasonable?

We are not in a position to assess whether new reactive support on the HVDC is warranted at this time, given it appears to be mainly focused on increasing HVDC availability. It is not clear as to the extent of the availability issue.

For the tactical thermal upgrade of the line effectively from BPE to WKM, we suggest running some models to assess how demand response, battery and different generation scenarios could play out to defer the need for this upgrade.