

15 August 2022

Nova Energy Limited
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Submissions
Transpower

By email: nzgp@transpower.co.nz

Re: Net Zero Grid Pathways 1 – Major capex project investigation

Nova appreciates the extensive work that Transpower has put into developing its shortlist for preferred investment options for the grid backbone. As is acknowledged in the report, the methodology employed to weigh up the list of feasible projects favours just-in-time, incremental options.

In the big-picture of the New Zealand electricity grid and its need to evolve, the Stage 1 proposed works are minor and appear uncontroversial.

Nova agrees with pursuing the preferred projects as Stage 1 of its Major Capital Proposal, but also considers further work in the 'Preparedness projects' to be equally important. Nova supports exploring "approaches to quantifying the resilience benefits of diverse transmission routes and risks due to natural disasters". In addition to the potential for natural disasters, potential developments such as Tiwai & hydrogen in Southland, Onslow, and offshore wind in Taranaki are a sample of economic uncertainties that are difficult to incorporate into planning.

Nova suggests that Real Options Analysis might be a useful tool for facilitating the next stage of planning. As an example, if a new line SFD_WKM were to be built to be 400kV capable, then that could be uprated to 400kV as an extension of the existing Auckland_WKM capable line in the event of volcanic activity in the Taupo / Tongariro region, thereby reducing reliance on the existing Central Plateau circuits. Clearly, on its own such an investment would not be economic, but as a potential link to an alternative HVDC route in future, offshore wind in Taranaki, or upgraded BPE_SFD lines, it could have value.

Regarding the CNI plan, the timeframes for North Island grid backbone upgrades beyond the planning horizon (2036) [Transmission Planning Report 2021] appear to be overly conservative considering recently announced North Island generation projects.

The economic assessment of Transpower's NIGUP project, published in 2006, discussed the complexities in trying to apply real options analysis to a real world scenario (<https://www.ea.govt.nz/assets/dms-assets/4/476604Econ-rep.pdf>). It also serves as a useful reminder as to how far well informed and perfectly reasonable scenarios can fall wide of the mark.

Nova's response to Transpower's questions is appended and Nova looks forward to working with Transpower during Stage 2 of this MCP to continue shaping New Zealand's future grid

Yours sincerely



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Nova submission:

Net Zero Grid Pathways 1 – Major capex project investigation

Q No.	Question	Response
Q1.	Do you agree with our staged approach to this major capital investment programme?	<p>A staged approach is appropriate so long as the overall approach is cohesive over time.</p> <p>Uncertainty in future scenarios is acknowledged, particularly at this time as economic, technological and demand outcomes rapidly evolve. The staged approach manages this risk.</p>
Q2.	Is our approach to NTS reasonable?	<p>The approach to non-transmission solutions (NTS) is reasonable for planning purposes so long as the NTS options are presented to the market before major capital is committed to an upgrade project. It is also useful for the transmission issues to be well flagged in advance so that interested parties can adequately assess the potential before Transpower seeks formal expressions of interest.</p>
Q3.	Is our reduced list of options for enhancing capacity of the HVDC reasonable?	<p>Nova agrees with the short-listed HVDC options.</p> <p>The addition of the fourth cable (Option C3) has an additional benefit in terms of security of supply, i.e. the replacement of two of the existing cables at notional end-of-life could be extended if the fourth cable was in service, i.e. it provides additional security in the event of failure of one of the existing cables.</p> <p>The impact on NI reserves requirements is also important given Huntly Unit 5 (e3p), as likely risk-setter, is likely to remain in service well beyond 2030.</p> <p>Nova also notes that none of the options appear to be addressing the North Island harmonic issues that the existing HVDC (and other inverter based) assets introduce. These will be exacerbated as more inverter-based technologies are connected to the grid.</p>
Q.4	Is our reduced list of options for enhancing capacity of the CNI 220 kV corridor reasonable?	<p>Yes</p> <p>There is a question as to why a new line Bunnythorpe-Stratford-Huntly needs to terminate at Huntly? The distance between Stratford-Whakamaru is significantly shorter and still provides the benefit of by-passing the Taupo volcanic region.</p> <p>The option of upgrading the route through Hawkes Bay still relies on transmission through the Wairakei ring, which could be susceptible to volcanic action.</p>

Q No.	Question	Response
Q.5	Is our reduced list of options for enhancing capacity of the Wairakei Ring reasonable?	Yes
Q.6	Are our scenario weighting sets reasonable?	Yes
Q.7	Is our shortlist of HVDC and CNI Options reasonable?	Yes
Q.8	Is our shortlist of Wairakei Ring options reasonable?	Yes
Q.9	Is our choice of the preferred option reasonable?	Yes
Q.10	Is our conclusion that upgrading existing assets is more economic than bypassing the existing grid reasonable?	Yes, for the immediate future, as there is not yet sufficient confidence in the forward projections to justify need for such a major expansion. In future work however, resilience of the grid and consideration of real options must be considered in addition to pure capacity measures.
Q.11	Do you agree that our choice of preferred option is robust against sensitivity analysis?	Yes