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Submitted via email to [grid.investments@transpower.co.nz](mailto:grid.investments@transpower.co.nz)

## Consultation Paper – Cook Strait HVDC Submarine Cable Replacement and Enhancement

1. Thank you for the opportunity to submit on the consultation paper ‘Cook Strait HVDC Submarine Cable Replacement and Enhancement’.<sup>1</sup>
2. This submission is not confidential and can be publicly disclosed.
3. Orion owns and operates the electricity distribution infrastructure in Central Canterbury, including Ōtautahi Christchurch city and Selwyn District. Our network is both rural and urban and extends over 8,000 square kilometres from the Waimakariri River in the north to the Rakaia River in the south; from the Canterbury coast to Arthur’s Pass. We deliver electricity to more than 225,000 homes and businesses and are New Zealand’s third largest Electricity Distribution Business (EDB).

### Q1. Do you support replacing the existing cables?

4. Yes, we strongly support replacing the existing HVDC submarine cables. This replacement is critical as the cables will reach the end of their operational life around 2032, and extending their use significantly increases the risk of failure. The HVDC link is vital for New Zealand's power system, promoting reliability, flexibility, and market efficiency. A cable failure could lead to prolonged outages, posing significant risks to electricity market stability and national economic interests.
5. With nation-wide electricity demand projected to increase by 80.9% by 2050<sup>2</sup>, maintaining this critical infrastructure is essential for meeting future energy needs. We see this also occurring at a local level. Orion’s Future Energy Scenarios report for Mid-Canterbury found that by 2050, under a ‘System Transition’<sup>3</sup> scenario, peak demand could grow up to 110%, and consumption could grow up to 113%.<sup>4</sup> Ensuring that electricity supply is able to match increased demand will be essential to ensure the reliability and stability of New Zealand's power system.

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<sup>1</sup> <https://www.transpower.co.nz/projects/hvdc-submarine-cable-replacement-and-enhancement-investigation>

<sup>2</sup> <https://www.mbie.govt.nz/about/news/more-wind-and-solar-generation-needed-to-meet-future-demand>

<sup>3</sup> ‘System transition’ scenario means that there is transitional change in the energy sector, with significant electrification and decarbonisation of electricity generation. Change is enabled by technology change, or existing technology becoming cheaper as innovation lowers production costs. Much of the change occurs at a system, or central, level. This means there is little change in the way consumers interact with the energy system and little optimisation at the consumer end of the value chain.

<sup>4</sup> [The Orion Group Future Energy Scenarios](#)

6. The growing share of intermittent renewable generation requires greater flexibility to balance the system. Today, residential solar installations within our network total around 25MW, and combined applications for both utility solar and wind generation total 680MW. This trend is likely to be mirrored across the country; upgrading the HVDC link would facilitate the efficient distribution of intermittent renewable energy between the islands, supporting New Zealand's decarbonisation efforts.

## **Q2. Do you support adding additional capacity while replacing the existing cables?**

7. We strongly support increasing the capacity from 1200 MW to 1400 MW while replacing the existing cables. This upgrade is likely to be cost-effective, as integrating the capacity increase with the replacement project offers significant delivery efficiencies.
8. This capacity increase helps future-proof the system, supporting increased generation and consumption plans on both islands. The 1400 MW configuration also offers greater redundancy, reducing the impact of potential future cable failure events and improving overall system reliability.
9. Given the challenges of undertaking a separate upgrade project in the future, integrating the capacity increase with the replacement is a logical and beneficial approach that maximises the long-term value of this critical infrastructure investment.

## **Q3. Is there any other information or are there considerations that Transpower should be aware of, particularly new electricity generation, storage or load that would impact the need for additional capacity?**

10. Transpower should consider several emerging factors in their long-term planning for the HVDC upgrade. Large-scale green hydrogen production facilities, which could be significant electricity consumers, may affect regional demand patterns and HVDC utilisation. MBIE's Interim Hydrogen Roadmap has identified that, to support demand volumes, between 4.5GW and 9.8GW of additional electricity supply will be required by 2050.<sup>5</sup> The deployment of utility-scale battery energy storage systems (BESS)<sup>6</sup> in either island could also influence the balancing role of the HVDC link. These developments could alter the flow patterns and capacity needs of the HVDC system.
11. The rate of electric vehicle (EV) adoption and industrial electrification projects, especially in process heat, could accelerate demand growth in the near-term, and increase reliance on inter-island power transfers. Orion's Future Energy Scenarios report for Mid-Canterbury found that EV adoption, and nearly full electrification of heavy transport, could be one of the largest individual drivers for demand growth, projected to add over 2,200MWh to daily energy demand by 2050. Process Heat, under the System Transition scenario, is projected to add up to 145MW of demand in the Mid-Canterbury region.<sup>7</sup> These findings underscore the importance of considering such developments in planning for the HVDC upgrade, as similar trends across New Zealand could substantially impact HVDC capacity requirements.

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<sup>5</sup> <https://www.mbie.govt.nz/dmsdocument/26911-interim-hydrogen-roadmap-pdf>

<sup>6</sup> [https://www.ea.govt.nz/documents/4402/Consultation\\_paper\\_-\\_potential\\_solutions\\_for\\_peak\\_electricity\\_capacity\\_issues\\_1.pdf](https://www.ea.govt.nz/documents/4402/Consultation_paper_-_potential_solutions_for_peak_electricity_capacity_issues_1.pdf)

<sup>7</sup> [The Orion Group Future Energy Scenarios](#)

## Concluding remarks

12. Thank you for the opportunity to provide feedback on this consultation.
13. If you have any questions or queries on aspects of this submission which you would like to discuss, please contact us on 03 363 9898.

Yours sincerely,

A handwritten signature in black ink, appearing to be 'CR', written in a cursive style.

Connor Reich

**Regulatory Lead – Electricity Authority**