TRANSPOWER

HVDC Link Upgrade Programme

Short-list Consultation
May 2025

Upgrading a vital electricity connection for Aotearoa

New Zealand's High Voltage Direct Current (HVDC) link between the North and South Islands is a critical part of our national infrastructure. It helps ensure power is available where and when it's needed by connecting communities and businesses to electricity generators across Aotearoa.

When hydro lake levels in the South Island are low, the HVDC link can bring bulk electricity from the North Island, generated from sources like wind, geothermal, gas and coal, to the South Island to meet demand. When hydro lake levels are high, the link can transfer lower-cost hydro power from the South Island to the North Island.

Transpower is consulting on proposed upgrades to parts of the HVDC link that are due for replacement – the undersea cables across Cook Strait, the cable termination stations that connect the undersea cables to overhead lines, and the control system that runs the link.

The upgrades will mean the HVDC link can continue to serve New Zealanders in the 2030s, 2040s and beyond. It will also ensure the link is future-ready as our country's electricity use increases. Transpower is planning this work now so we can have suppliers and manufacturers ready to start the work later this decade.

We're seeking feedback on our short-list and preferred option for this work. This consultation is a vital step toward preparing an investment proposal for the Commerce Commission's consideration later in 2025.

Our preferred option

We've considered three potential options – 1) no investment, 2) like-for-like replacement, and 3) replacement with increased capacity in the undersea cables.

Based on the benefits to New Zealand, our preferred option is option 3) – replace the three existing undersea cables with higher-capacity cables that support up to 1400 MW of electricity transfer and upgrade the control system and cable termination stations.

More detail on the short-listed options and our evaluation of their benefits is in our short-list consultation documents.

Upgrading the control system, cable termination station and undersea cables

Our preferred option maintains secure electricity transfer between the islands and increases the maximum amount that can be transferred. Our modelling shows the expected net benefit of this investment is $3.07 billion over its expected life.

Both the undersea cables and the control system are due for replacement in the early 2030s as they near the end of their expected operational lives. Our monitoring shows the cables are currently in good condition but deteriorating as expected for their age and without replacement there would be significant risk of failure during the 2030s. The control system technology we use will be 20 years old in the early 2030s and being phased out, so will also need to be replaced. The buildings that house the cable termination stations also need to be upgraded to meet modern standards for earthquake and tsunami resilience and to accommodate new cable terminations. It is both safer and more efficient to replace the buildings at the same time as the cables.

Planning these projects together now allows Transpower to coordinate the upgrades, meet the necessary timeframes, and minimise the impact to the electricity sector. There is high demand globally for submarine cables and associated HVDC infrastructure and a limited number of companies that do this specialised work.

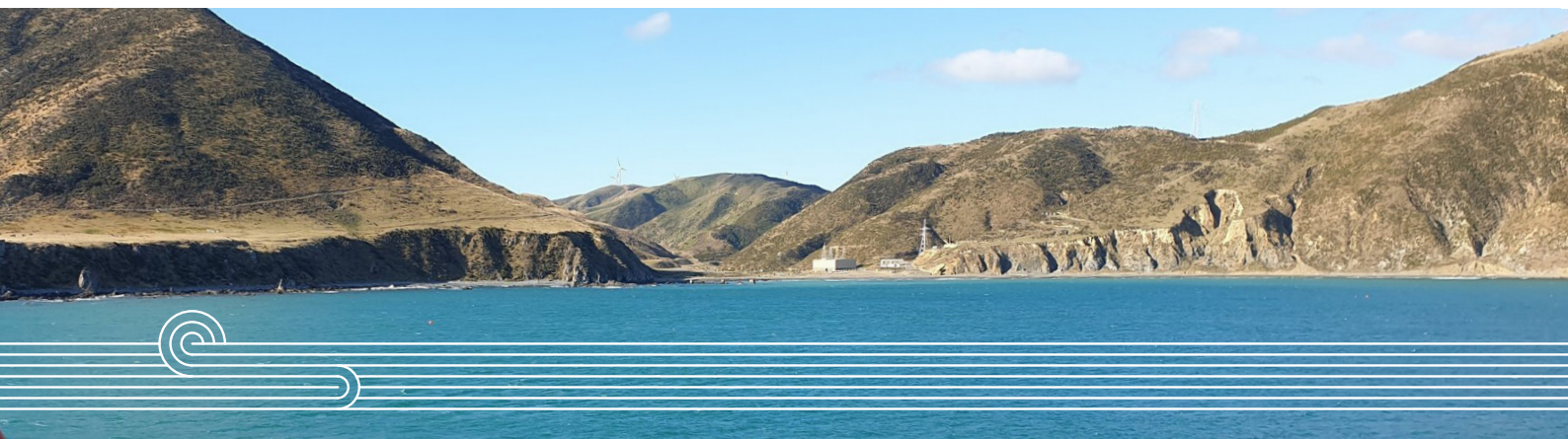
Our proposed HVDC link upgrade programme is made up of the following projects

Project	Estimated cost ($m)	Expected completion
Undersea cables supply and install (1400 MW)	721.1	2031
Cable termination station upgrades	77.0	2030
HVDC control system replacement	202.0	2031
Benmore filter bank upgrade	16.8	2030
Pole 2 overload scheme	10.8	2030
Cable storage facility	11.4	2030
Recovery of decommissioned cables	121.5	2033
Project investigation costs	10.4	
Allowance for interest during construction and inflation	209.2	
Estimated total	**1,380.2**	

If we proceed with our preferred option, Transpower would submit a Major Capex Proposal to the Commerce Commission seeking approval to recover costs of around $1.4 billion through Transpower transmission charges, spread over the expected life of the assets.

How electricity infrastructure investments are funded

All electricity users pay for transmission infrastructure as part of electricity bills. The Commerce Commission regulates Transpower's investments and spending, while the Electricity Authority regulates how much Transpower can charge customers. If approved by the Commerce Commission, the cost of new electricity infrastructure is recovered through transmission charges, which make up under 8% of consumer's electricity bills.



Proposed HVDC Link Upgrades

Transpower proposes the following projects as our preferred option.

HVDC Control System Replacement

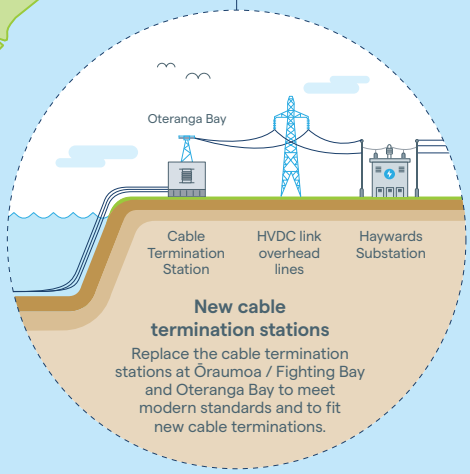
The control system technology will be 20 years old in the early 2030s and being phased out, so will need to be replaced. The control system communicates and works together with equipment at many locations to transfer electricity and keep the wider transmission grid stable.

Undersea cable supply and install

Replace the three existing cables when they reach the end of their life, as expected, in 2031. Replacing them with four new cables will increase how much electricity the link can carry, setting New Zealand up for the future.

Recovery of decommissioned cables

Once the new cables are in place and working well, we would remove the cables we use today.



New cable termination stations

Replace the cable termination stations at Ōraumoa / Fighting Bay and Oteranga Bay to meet modern standards and to fit new cable terminations.

New submarine cable storage facility

A dedicated storage facility for spare cable lengths, which can be used if needed for smaller-scale repairs.

1400 MW

Benmore filter bank upgrade

Upgrade filter bank equipment at Benmore to enable electricity transfer of up to 1400 MW.

Pole 2 overload scheme

Boost the overload capacity of Pole 2 to better manage the risk from unplanned outages on Pole 3.

Key

- Transmission lines 66 - 220kV AC
- Transmission lines 350kV HVDC
- Transpower substations
- Cable termination stations
- HVDC Undersea Cables
- Cable Protection Zone

Auckland

Haywards Substation

Wellington

Christchurch

Benmore Substation

Dunedin

Your feedback

We want to hear your view on this option and whether you agree it will best meet New Zealand's electricity needs. This could also include your thoughts on our assessment of the benefits, the electricity demand and generation information we have used and any other aspects of the short-list documents.

Please email us by 20 June 2025:
grid.investments@transpower.co.nz

What happens next?

After this consultation, we will consider all feedback and include any new information in our thinking and plans. If needed, we will then refine our pricing for the different options.

Transpower will complete a final economic assessment and submit a Major Capex Proposal to the Commerce Commission in the second half of 2025. The Commerce Commission will review our proposal and undertake its own public consultation. It will then make a final decision on approval for the work, expected in around early 2026.

In the meantime, Transpower will continue working with manufacturers and suppliers of HVDC equipment to ensure the parts and expertise we need are available. We will continue to update you on our progress.

For more information and the latest updates see:

transpower.co.nz/hvdc-upgrade