



# Net Zero Grid Pathways

July 2021

## What is Net Zero Grid Pathways?

Net Zero Grid Pathways (NZGP) covers Transpower's investments on the backbone of Aotearoa's electricity transmission grid. These investments will enable the electrification of the economy and assist with meeting New Zealand's decarbonisation targets. This includes ensuring the grid backbone has enough capacity to accommodate new renewable generation and maintain a secure and reliable supply of electricity.

NZGP has two phases – the first is to enhance the existing grid backbone to 2035, and the second addresses the likely need for a larger grid backbone with new interconnections beyond 2035.

Uncertainty regarding the timing of market entrants and exits is one of our challenges in the short term. Whether the New Zealand Aluminum Smelter at Tiwai Point closes, or not, when and where the next

renewable generation projects will be built, and decisions around the NZ Battery Project will each impact what transmission investment is needed first. Regardless, we know there will be a need to increase the capacity of some parts of the main grid backbone in the medium term, under most scenarios. This is being driven by the growing electrification of our economy and preferences for renewable electricity generation.

We plan to take a least regrets approach to identifying the range of upgrade projects needed on the grid. To do this we need industry and customer input. Transpower is only one link in the electricity delivery chain and the most efficient pathway will only be achieved if we can assist in creating a 'joined up' view of grid needs with our industry partners.



# What's the process for projects within Net Zero Grid Pathways?

NZGP projects and investigations are divided into:



## Tactical investments

Lower cost upgrades that can be delivered in the next five years. These projects maximise the value of the existing grid and will help address uncertainty in the short term. An example in this category is the Wairakei Ring Series Reactor. You can find more information about this on [our website](#).



## Phase One

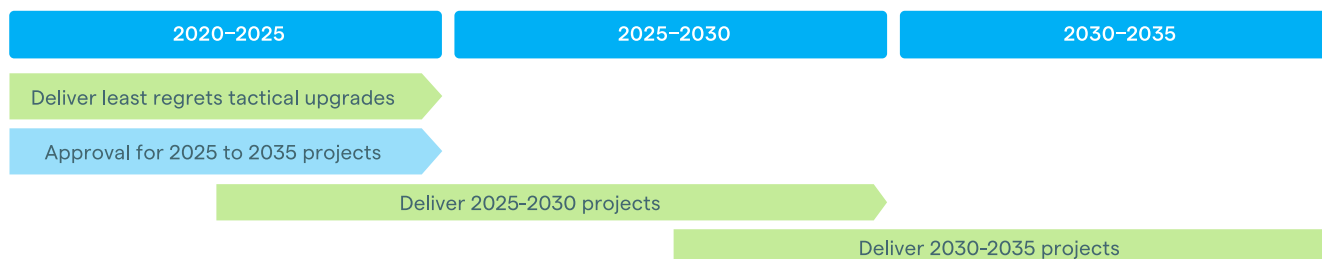
Major projects to deliver in the next 15 years, that are likely to go through the Commerce Commission major capital expenditure project (MCP) approval process, with expected costs of greater than \$20m. A project already underway in this space is the Clutha Upper Waitaki Lines Project (CUWLP). Other likely projects include work to upgrade capacity on the existing grid backbone, including the HVDC link and Central North Island lines.



## Phase Two

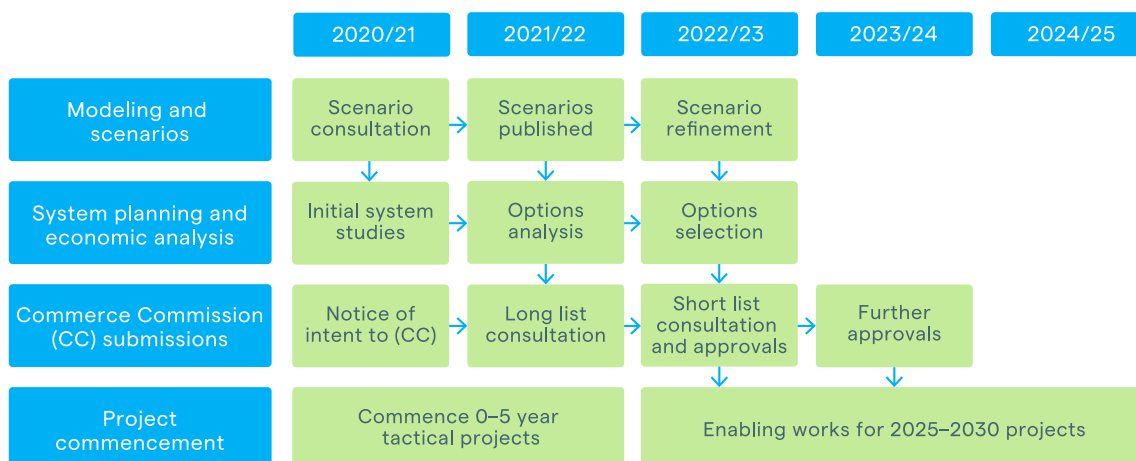
Projects to deliver in 2035-2050 as decarbonisation further accelerates. Early in 2022 the NZGP team will use future electricity demand and generation scenarios to again engage with the industry to plan out to 2050. This engagement will consider the needs for the grid backbone in a net zero carbon economy with a high reliance on electricity to power our communities, homes and businesses.

## High-level NZGP project delivery timeline – Tactical investments and Phase One:



## High-level NZGP planning process – Tactical Investments and Phase One:

Activities by financial year (July-June)

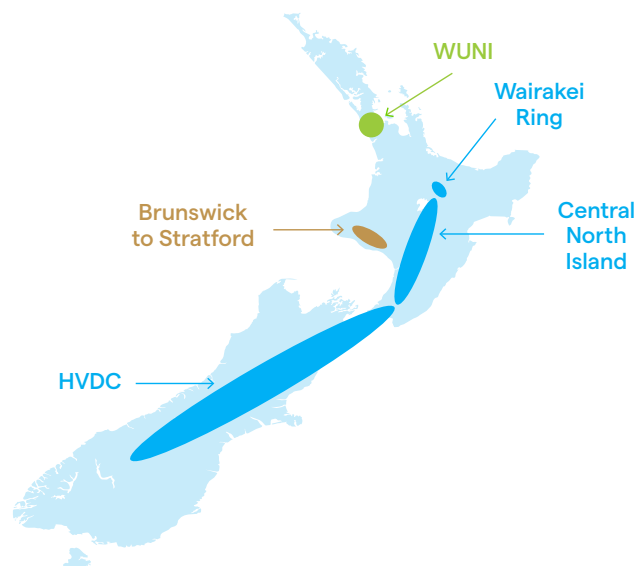


# Meeting the initial needs: Tactical and Phase One investments

Initial findings from Transpower's investigations have identified several least regrets, tactical investments we can make in the next five years. These investments are needed in all scenarios, deliver high economic benefit for a relatively low cost, and can be delivered quickly. While these investments will deliver significant value, there is still the need to develop more substantial, longer term investments as well, as the electrification of our economy continues to grow.

In addition, under Phase One there are likely to be major capital project grid upgrades required for:

- Lower South Island: Clutha Upper Waitaki Lines Project
- South Island to North Island interconnection: HVDC capacity increase
- Central North Island (CNI) upgrades
- Wairakei Ring upgrades
- North Island voltage: Waikato Upper North Island Voltage Management (WUNI-VM) project
- Taranaki region: Brunswick-Stratford line



## Timeline of investment

The timeline for possible investments in these areas shows that there are both immediate and larger projects in progress or under investigation, to meet the grid's needs at various points.

CORE NZGP	TACTICAL INVESTMENTS BY 2025	PHASE ONE INVESTMENTS 2025-2035
Lower South Island	<u>Clutha Upper Waitaki Lines Project</u>	Under investigation, options subject to uncertainties including any Tiwai Point closure and replacement loads and Government decisions on the NZ Battery Project.
South Island to North Island	HVDC tactical investments – Under investigation, further information in August 2021.	Possible addition of a fourth HVDC cable to increase capacity to 1,400 MW. Long list consultation in August 2021.
Central North Island	CNI tactical investments – Under investigation, further information in August 2021.	CNI upgrades – Under investigation, long list consultation in August 2021.
Wairakei Ring	Wairakei Ring Series Reactor	Wairakei Ring upgrades – Under investigation
RELATED PROJECTS	INVESTMENTS BY 2025	INVESTMENTS 2025-2035
Waikato to Upper North Island	Deliver Waikato Upper North Island Voltage Management (WUNI-VM) phase 1a. Consultation on non-transmission option (e.g. grid scale battery) in August for 1b.	WUNI-VM phase 2
Brunswick Stratford	Decision on capacity and retention/upgrade of existing lines. Delivery of approved work.	





# Industry consultation during 2021

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## Least regrets tactical investments

Our work to date has identified economically viable, smaller scale, least regrets investments that could be implemented within five years. These are needed in all scenarios, deliver high economic benefit for a relatively low cost and can be delivered quickly. Read our April update on our website for a list of those investments.

In addition, we want to work with those across the electricity industry to confirm the need and scope, then plan and seek approval for larger projects to 2035.

## Consultation on HVDC and CNI Long List Options – August 2021

We plan to consult on the long list of options for increasing the HVDC capacity and CNI capacity in August 2021.

## Options for Batteries and other Transmission Alternatives to meet NZGP project needs – August 2021

In August 2021 we will seek interest in viable options for non-transmission solutions, both to meet the needs of our WUNI-VM project and, separately, as a part of our HVDC/CNI long-list document.

## Brunswick Stratford 220kV – September 2021

We plan to consult on our shortlist of options in September-October 2021 and submit our application to the Commerce Commission in January-February 2022.

## Ongoing opportunities for input

Transpower's customer team will continue to keep in regular contact with customers, who include generators, electricity distribution companies and some major electricity users. Transpower Relationship Managers are always available to discuss future scenarios, with a view to ensuring that the development of Aotearoa's national grid best meets both demand and supply needs.

For the latest updates see:

[TRANSPOWER.CO.NZ/NZGP](https://transpower.co.nz/nzgp)

