



Invercargill – Awarua 66kV Line Route

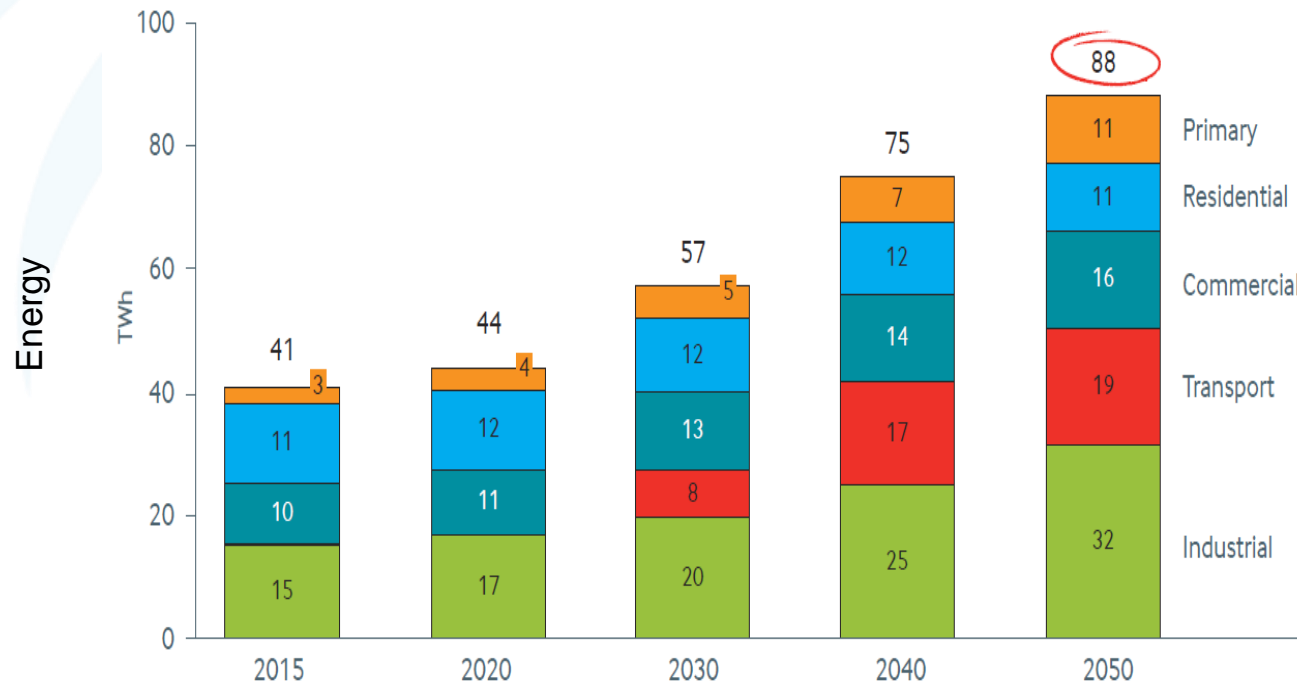
20 August 2024

Jason Franklin – Chief Executive

New Zealand is decarbonizing

- NZ Government is targeting removing carbon from the country to meet our international commitments – Paris Accord
- To do this, mainly looking to move to electric energy by phasing out coal and other fossil fuels (petrol, diesel, etc)
- From 2020 to 2050, forecast electricity use is set to double in NZ
- This will require a lot more power stations, transmission and distribution line assets to power NZ
- Southland is moving fast to decarbonise, initially due to removing coal from industries, with transport and heating to follow
- We need to ensure we have the infrastructure in place to meet our customers' needs

Electricity demand by sector



Source: Te Mauri Hiko Energy Futures, Transpower

Electricity distribution networks investments

National Electricity Demand and Investment

OVERVIEW

COMPARE BY TIME

COMPARE BY VARIABLE



SELECT TOPIC

Drivers of increased electricity demand

BY DECADE

2023-2030

2031-2040

2041-2050

VARIABLES

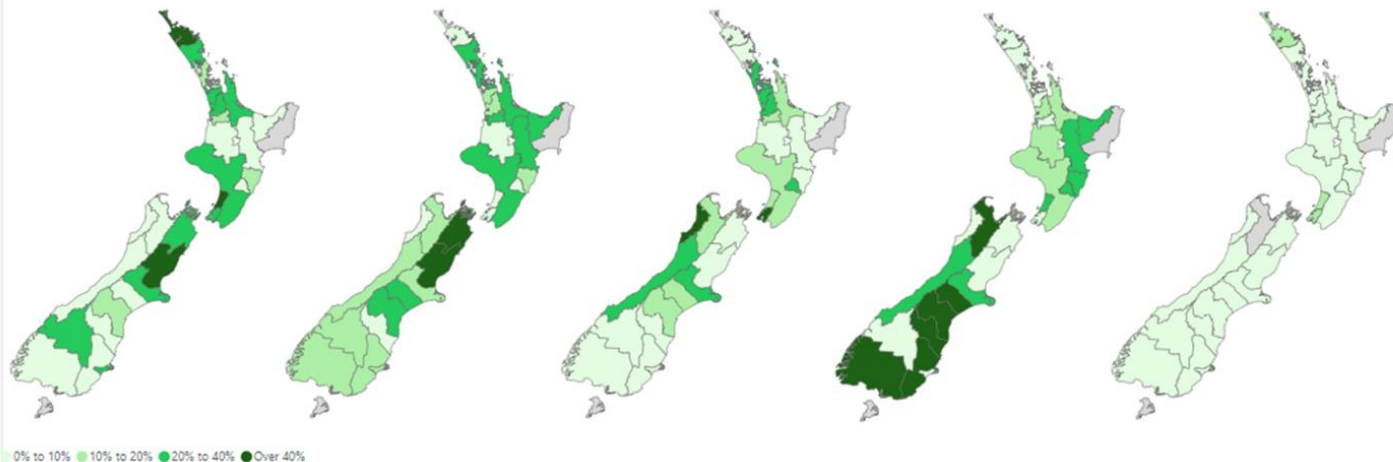
Population growth

New commercial / industrial point loads

Electric vehicles

Industrial process heat conversion

Residential & commercial gas conversion



<https://www.ena.org.nz/resources/edbs-investment-driver-heatmap/>



Southland & Otago

- There are a lot of electricity network upgrades underway and planned at present;
 - Athol to Kingston 66kV line
 - Gore to Kaiwera Downs for the Mercury wind farm and that new line
 - Lornville area upgrade for Alliance
 - Edendale area upgrade, including new Grid Exit Point, for Fonterra
 - Gore to McNab upgrade for Mataura Valley Milk
 - Invercargill to North Makarewa network reinforcing
 - Invercargill to Awarua upgrade for industry in Awarua region
- Five years ago we were investing \$40-\$50 million per annum into Capital upgrades
- This year and beyond, it is forecast at \$80-\$100 million
- The network investments are designed to meet the regions needs for the next 50-100 years
- Let's focus on Invercargill to Awarua.....

Line Route - Overview



Invercargill to Awarua

- Three parts to the project;
 1. upgrades at the Transpower Grid Exit Point substation off Findlay Road
 2. new substation at Awarua (Kekeno Substation)
 3. new 66kV line from Findlay Road to Awarua
- All upgraded and new distribution network lines need to comply with national standards, such as AS/NZS 7000, NZECP34 and Electricity Act 1992
- Electricity distribution businesses also have certain rights to access the road corridor under the Electricity Act 1992 and RMA 1992

Design & Line Route Considerations

- Multiple line routes and design options have been considered
 - Specific queries;
1. **Overhead Line vs Underground Cable**
 - for this project, the overhead line build is estimated at \$10.9 million over the 19.5 km
 - undergrounding is estimated at \$36.6 million, an additional \$25.7 million (3.4 times more)
 - cost per kilometre is \$559,000 vs \$1,877,000
 - Also, underground 66kV cables provide additional technical challenges than above ground lines

Design & Line Route Considerations

- Multiple line routes and design options have been considered
- Specific queries;
 2. Why not tap into the Transpower 220kV line to Tiwai
 - Over \$40 million to build a new Grid Exit Point under the line
 3. Why not take the line down Racecourse and Rockdale Roads
 - Line route too congested – not feasible
 4. Multiple line routes across private land
 - land access issues with construction and ongoing maintenance (planned and unplanned – faults)
 - if able to firstly obtain all landowner approvals, then have significant additional costs involved

Any General Questions?

Following Slides: Detailed Line Route

12 slides

Route Layout - 1



Route Layout - 2



Route Layout - 3



Route Layout - 4



Route Layout - 5



Route Layout - 6



Route Layout - 7



Route Layout - 8



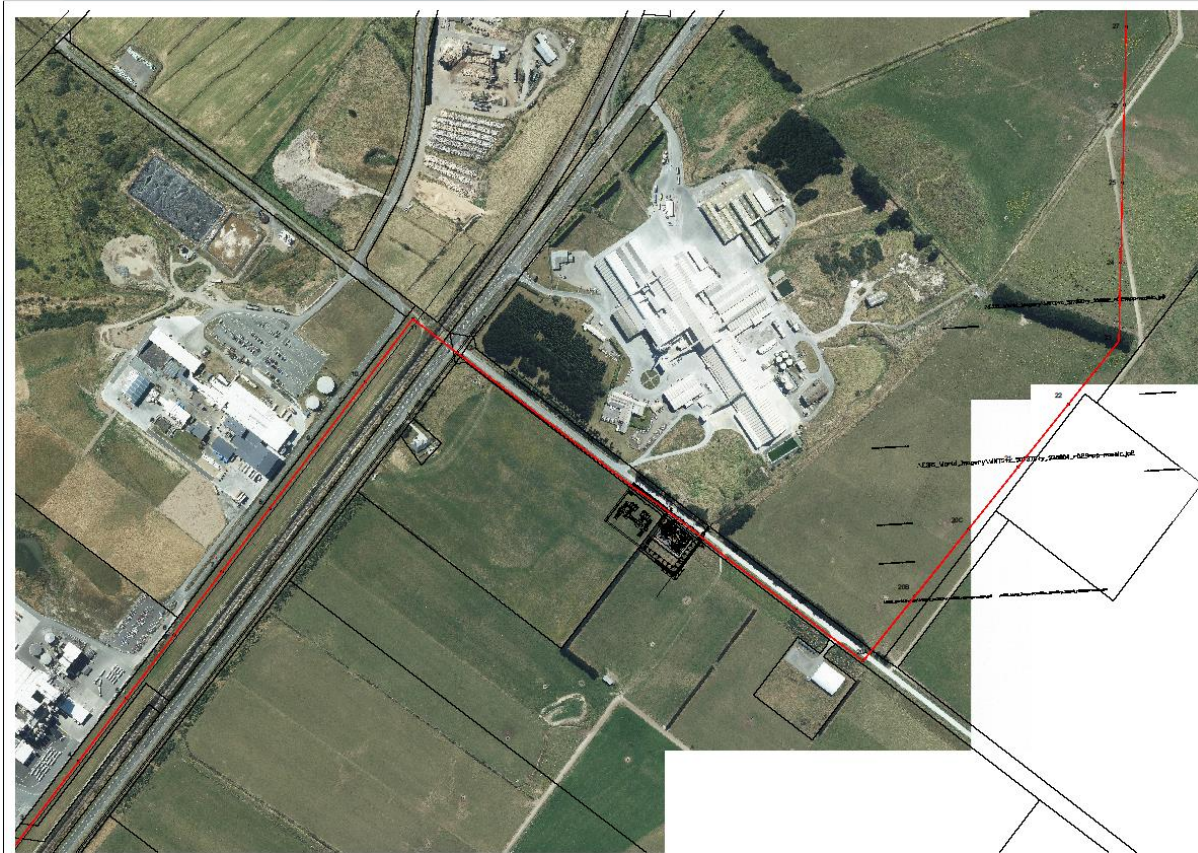
Route Layout - 9



Route Layout - 10



Route Layout - 11



Route Layout - 12



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