

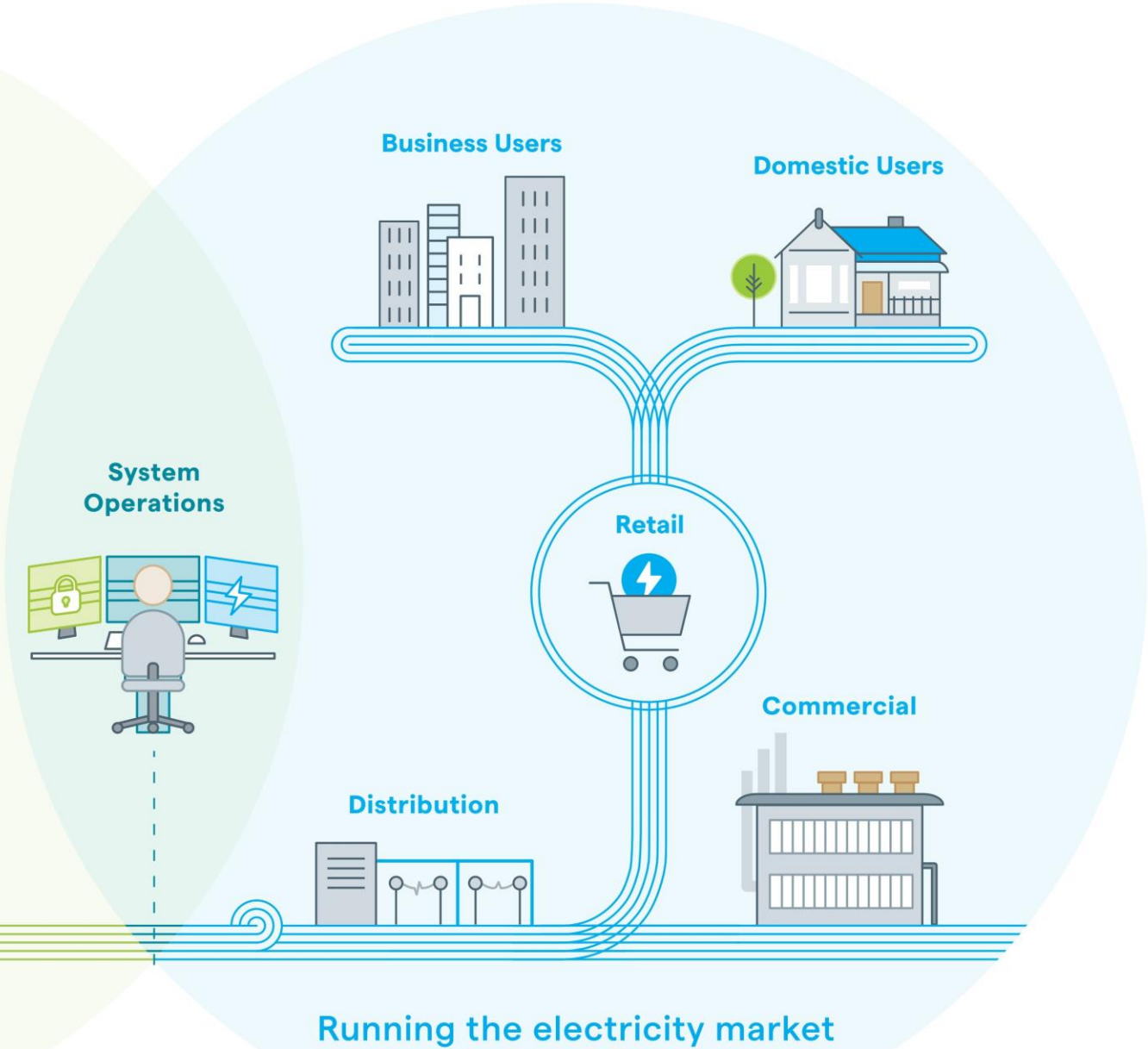
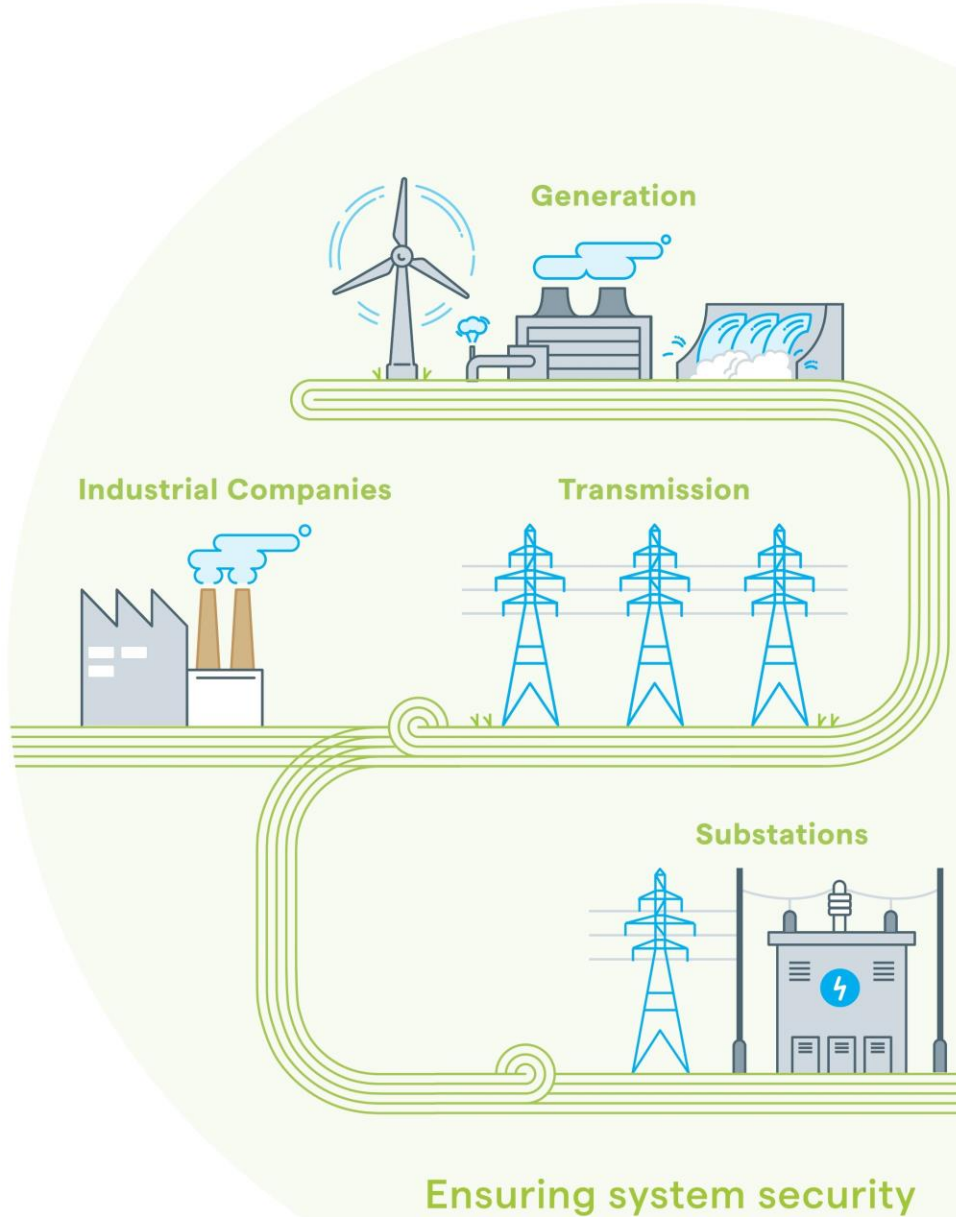


TRANSPOWER



Energy sector decarbonisation

Stephen Jay – General Manager Operations, Transpower



Several factors influencing New Zealand's energy sector



Decarbonisation drive

- 66 countries are committed or declared to be net zero carbon by 2060 or earlier
- New Zealand carbon budgets set last May

Technology

- 9.1% growth in global renewable generation capacity added in 2021 (+257 GW)
- Wind and solar make up 88% of the new capacity

Geopolitical

- Europe intensifying its efforts to decrease reliance on Russian energy fuels
- International supply chain pressure



New Zealand is attracting international interest



Renewables

- Copenhagen Infrastructure Partners is eyeing 4GW of offshore wind generation in Taranaki
- Google exec-backed Helios has 1GW in the pipeline



Data centres

- Amazon to invest \$7.5bn in the country over the next 15 years
- DCI Data Centers to invest \$600m in Auckland
- Datagrid expected to invest about \$1bn in Southland



Green Petrochemicals

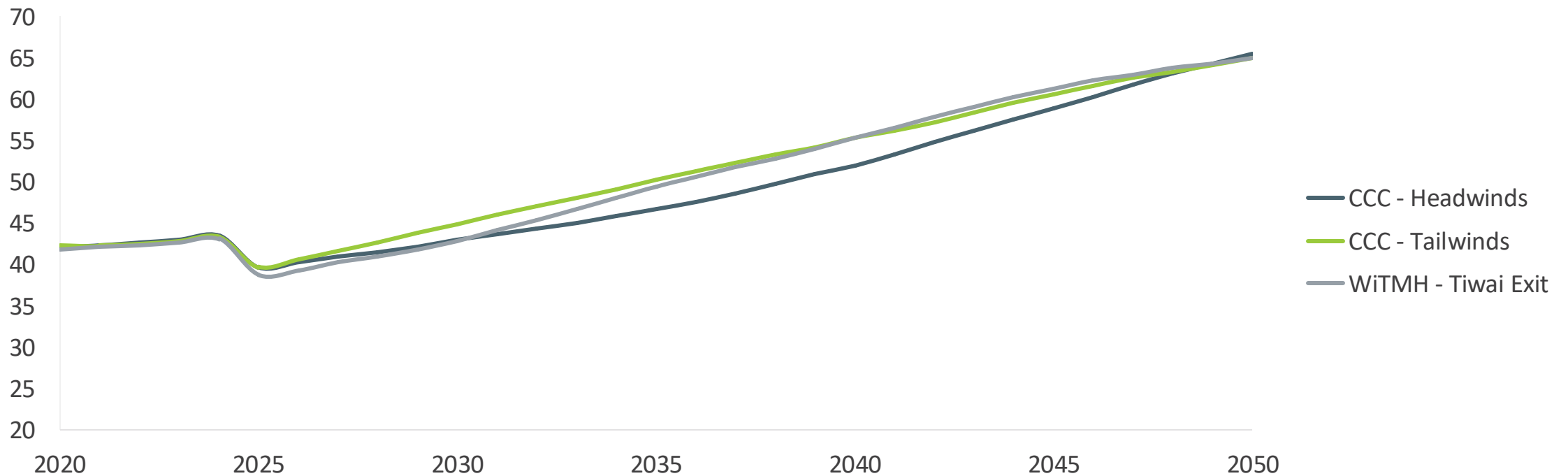
- Southern Green Hydrogen project
- Green aviation
- Potential for e-methanol and e-ammonia



Electricity demand will rise as we electrify transport, process heat and other parts of our lives

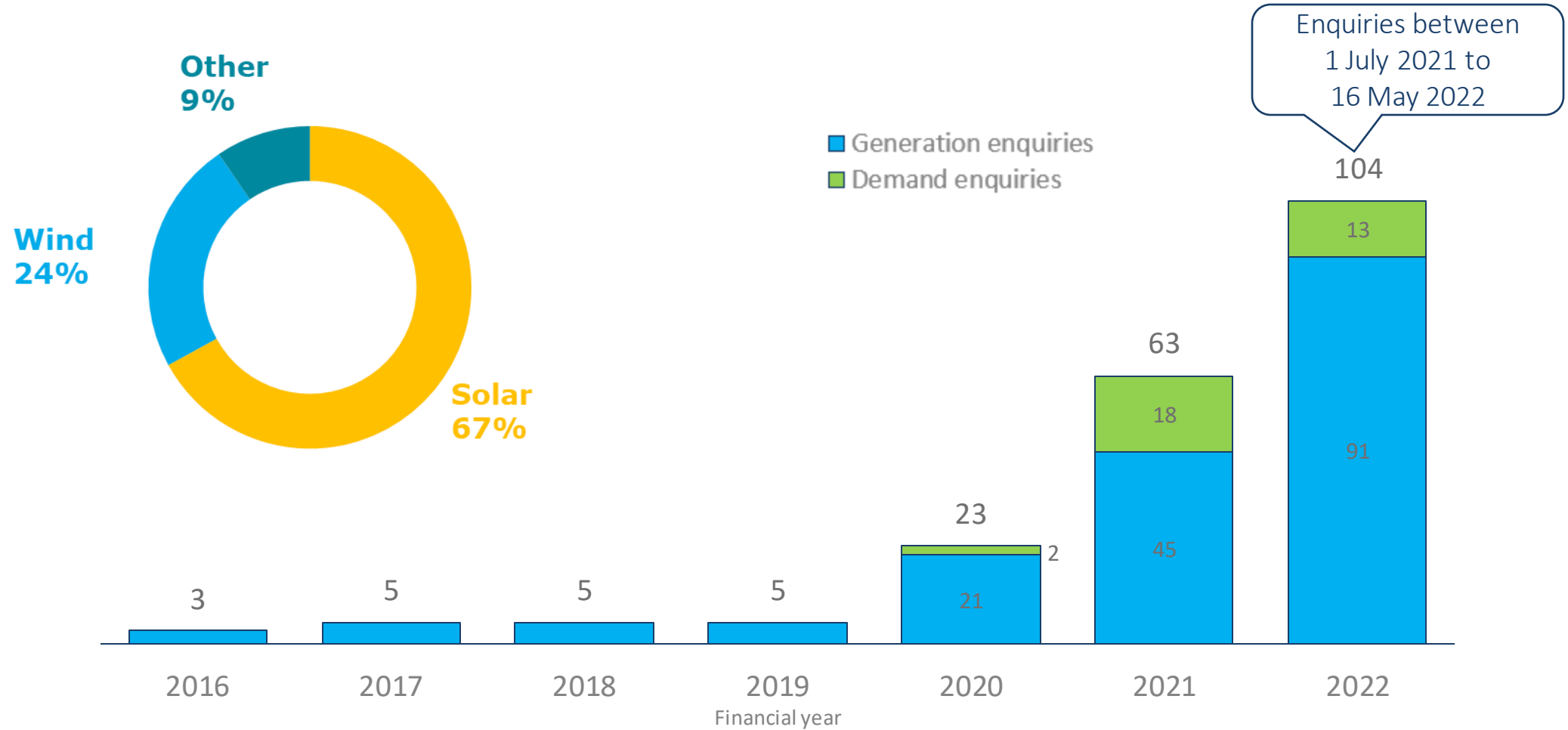
Electricity demand in Whakamana i Te Mauri Hiko and Climate Change Commission Scenarios

Demand, TWh



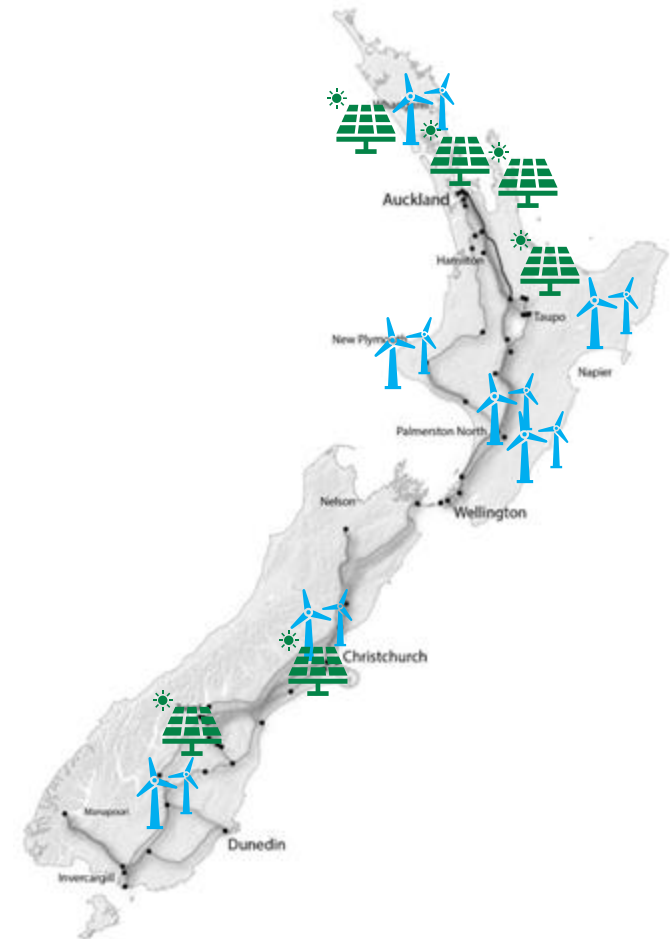
*2020 demand normalised for COVID demand reductions

We are experiencing an unprecedented level of interest in connecting to the grid



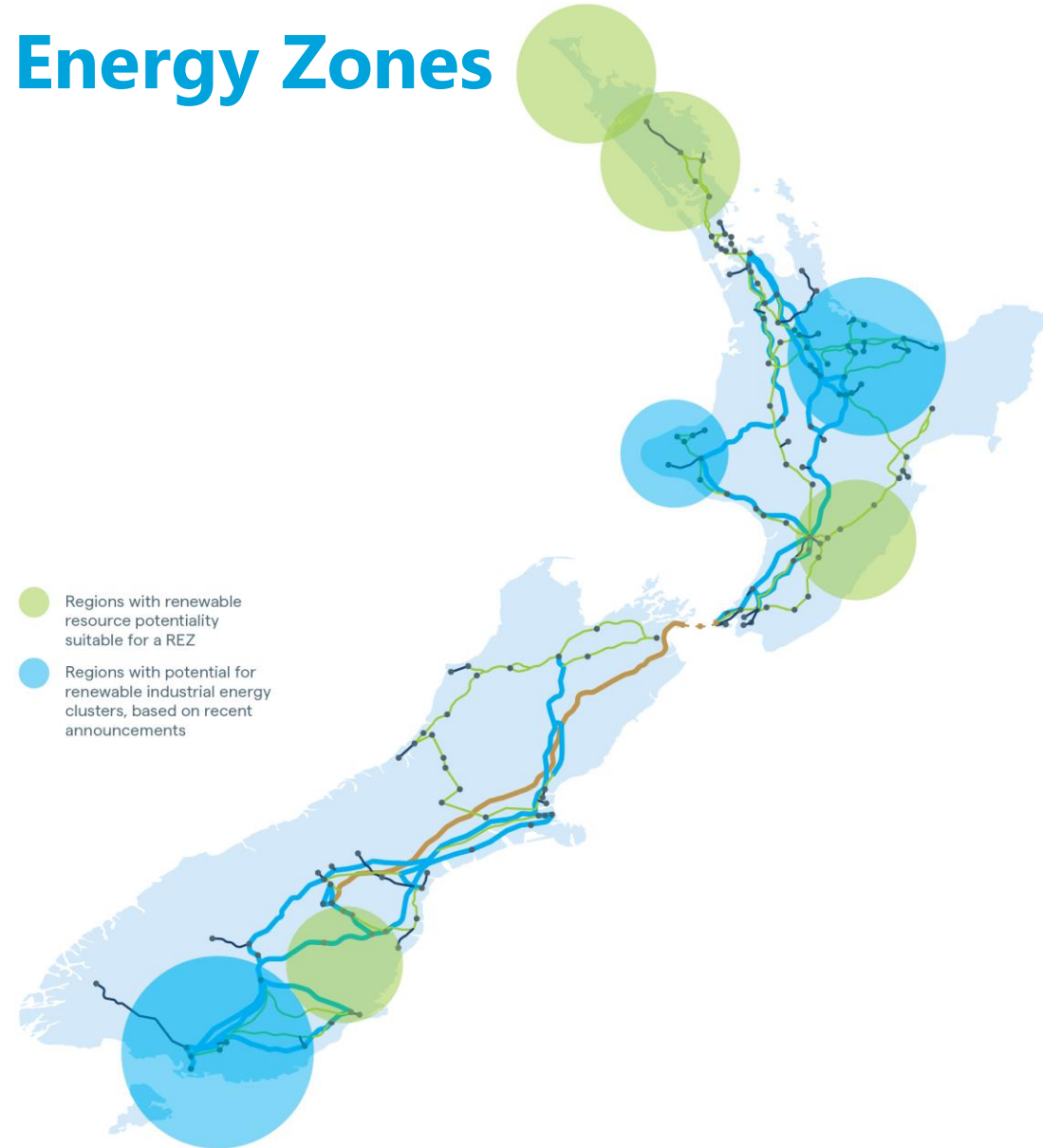
Snapshot of new generation development underway

| Status | Developer | Project | Capacity |
|---------------------------|----------------------------------|----------------------|----------|
| Commissioned in 2021 | Tilt (Mercury) | Waipipi Wind Farm | 133 MW |
| | Mercury | Turitea Wind Farm | 222 MW |
| Under construction | Contact | Tauhara Geothermal | 152 MW |
| | Meridian | Harapaki Wind Farm | 176 MW |
| Final investment decision | Tilt (Mercury) | Kaiwaikawe Wind Farm | 75 MW |
| Announced | Mainpower | Mount Cass Wind Farm | 93 MW |
| | Genesis / FRV | Solar Joint Venture | 500 MW |
| | Lodestone Energy | Solar farms | 229 MW |
| | Mercury | Puketoi Wind Farm | 200 MW |
| | Tilt (Mercury) | Tararua 1 repowering | 140 MW |
| | Christchurch airport (Solar Bay) | Kōwhai Park | 150 MW |
| | Harmony Energy | Te Aroha | 147 MW |
| | HES Aotearoa | Helensville | 53 MW |
| | Solar Bay | Naseby | 59 MW |
| | Numerous | Smaller scale solar | 100 MW+ |



Our investigation into Renewable Energy Zones

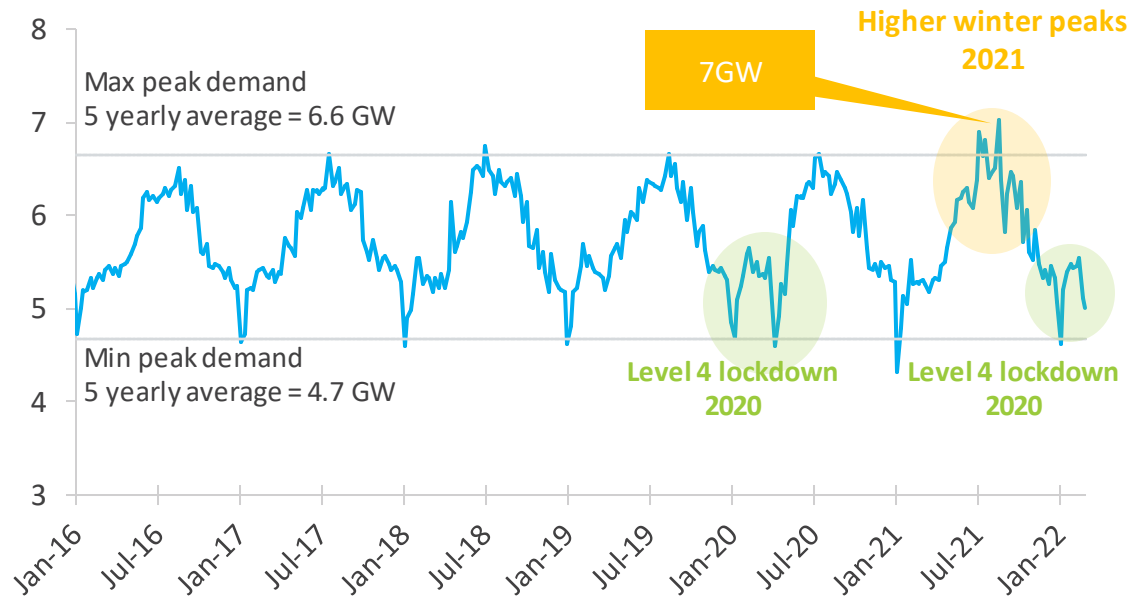
- Several areas in New Zealand may be suitable for a Renewable Energy Zone, based on connection enquiries and public announcements
- Transpower has proposed criteria, in the consultation document, for selecting where to develop Renewable Energy Zones
- At this stage Northland has been identified as the pilot zone
- 129 responses, broadly in support
- Now investigating the regulatory and commercial barriers



Peak demand is growing and will become an issue without flexible demand

Evolution of the weekly peak demand

GW



- Peak could reach 10.8GW by 2035
- Flexibility could limit that peak to 8.9GW
- Every GW of avoided peak avoids ~\$250m of costs to build new infrastructure per year thanks to the deferral of:
 - New generation (~25%)
 - Transmission upgrade (~25%)
 - Distribution upgrade (~50%)

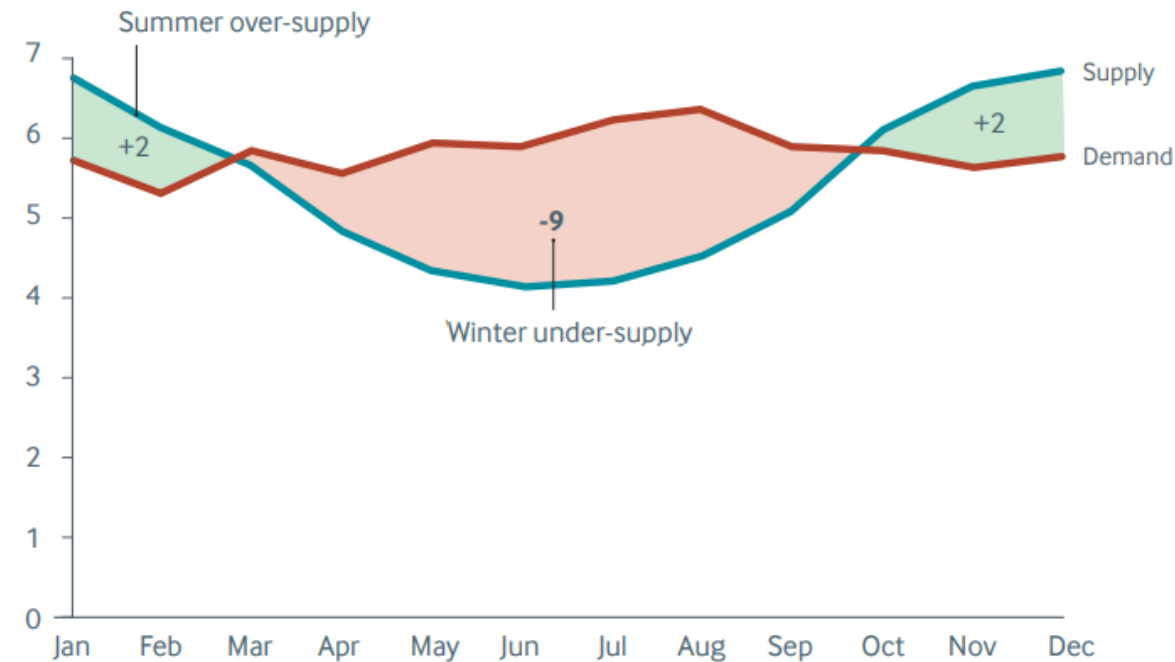
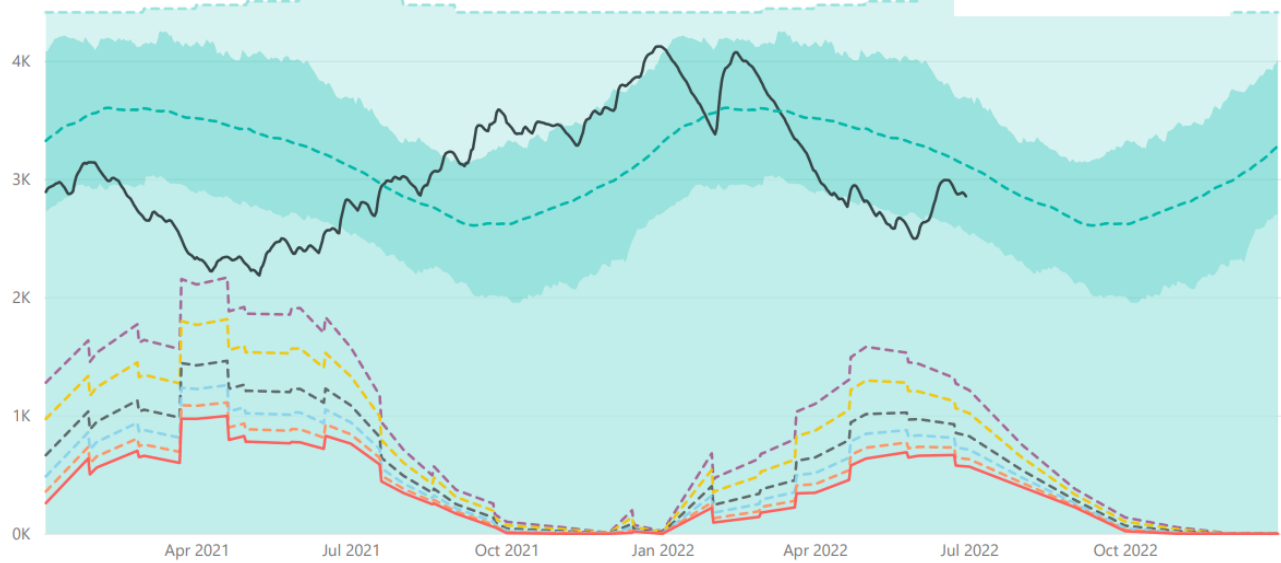
By 2050, our dry year problem will be about 9 TWh

Figure 25: Monthly supply and demand estimates for dry year

(TWh, 2050)

New Zealand Percentage Electricity Risk Curves (Available GWh)

Wednesday, 29 June 2022



We need to continue working on the ten industry areas of change outlined in Whakamana i Te Mauri Hiko

- 1 Streamlining connections processes for energy infrastructure
- 2 Integrated energy system planning
- 3 Getting the incentives right for decarbonisation and renewables
- 4 Removing barriers to low carbon infrastructure
- 5 Demand-side participation in energy markets
- 6 Ensuring supply meets peak energy demands
- 7 Security of energy and managing dry year risk
- 8 Protecting system stability
- 9 Access to skilled workforce
- 10 **Collaboration**



Thank you

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