

2024 Offshore Renewable Energy Forum

20 – 21 March 2023 | TSB Hub, Hāwera



John Hutchings

Director, Hutch Consulting

Panel session:

Realising future Infrastructure needs

- **John Hutchings - Director, Hutch Consulting (*Facilitator*)**
- **Ross Dingle - GM Commercial, Port Taranaki**
- **Hayden Mackenzie - Investment Manager, NZTE**
- **Fraser Robertson - Infrastructure NZ Board Member and Director, RCP**

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Nic McGrath

Mechanical Engineer, Aurora Offshore Engineering



AURORA OFFSHORE ENGINEERING

Specialists in Hydrodynamics, Seabeds, Structures

Lessons learnt from
>13GW of OWF
subsea cables

Cables are NOT subsea pipelines

- Subsea cables are NOT subsea oil or gas pipelines
- No hydrocarbon safety or environmental risk
- Design methods inherited from O&G based on containment risk



Cables are NOT subsea pipelines

- For offshore renewables we deliberately look for places that are windy, wavy or have strong currents



Cables are NOT reliable enough

Subsea cables are:

- 9% of project CAPEX
- 80-90% of insurance claims by value / frequency
- Becoming “uninsurable” – especially FLOW

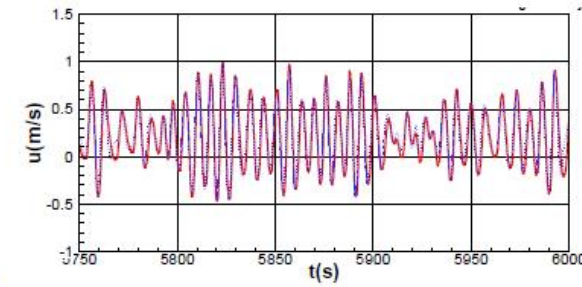
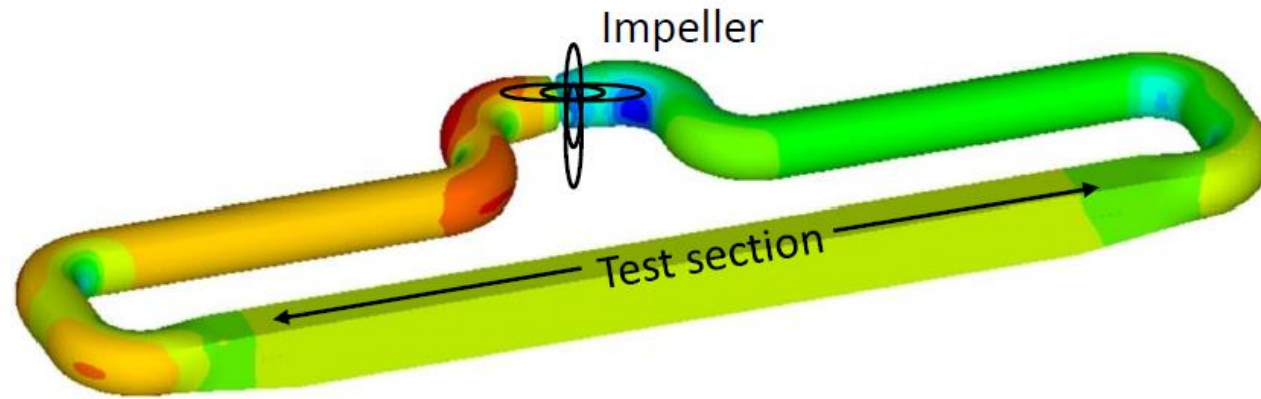


(Bates et al., 2023)



(Reda et al., 2021)

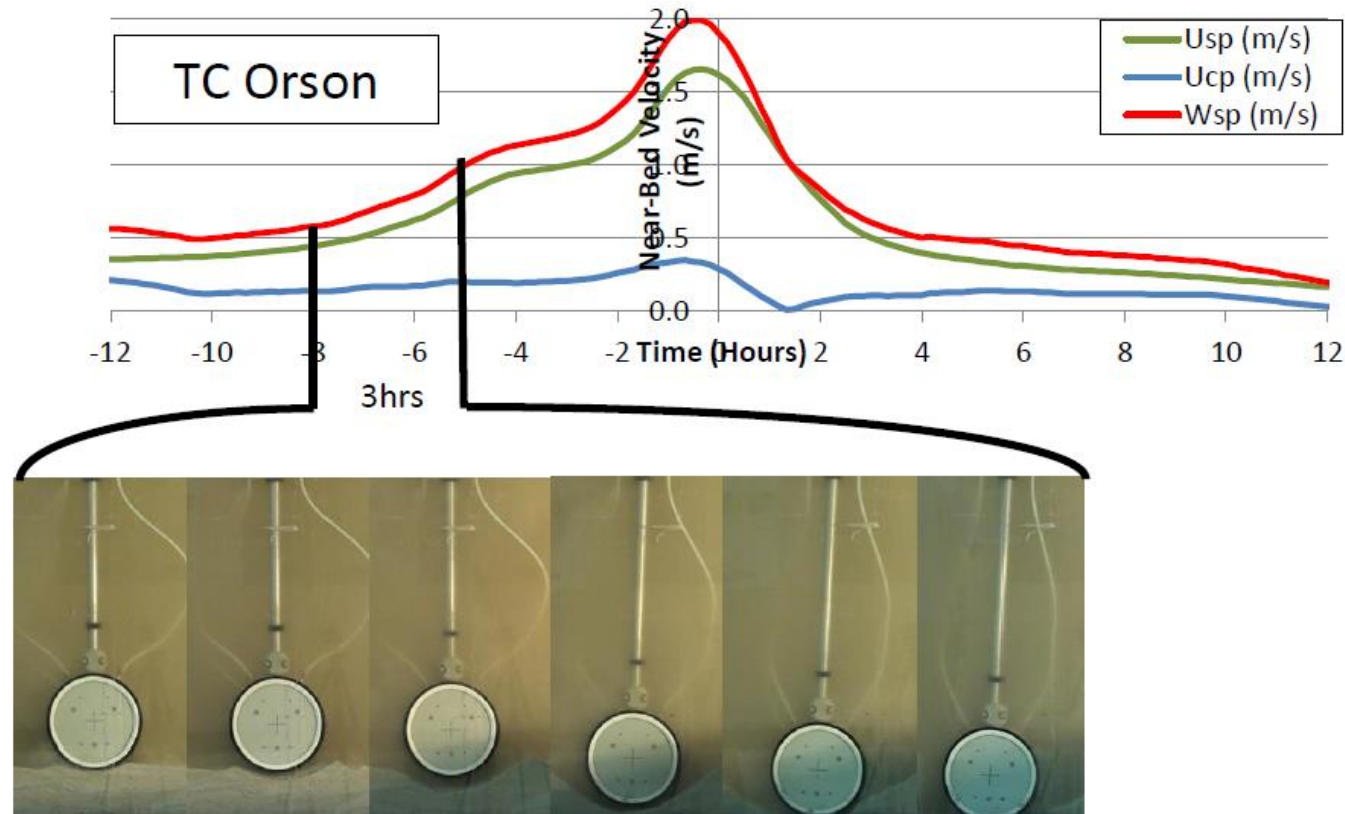
New paradigms: UWA's O-tube technology



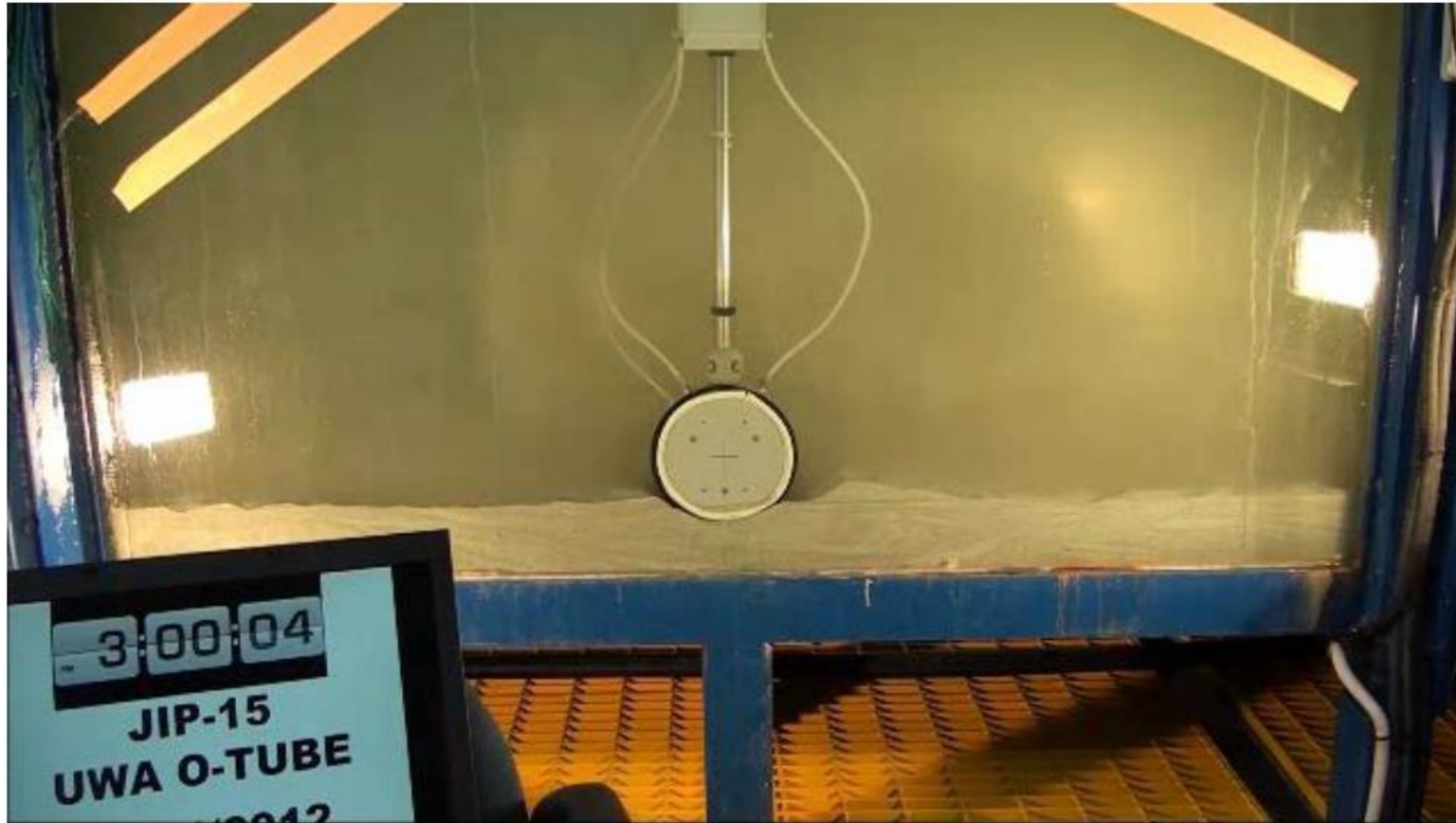
17m x 1m x 1m
0-3m/s steady
Waves 2.5 m/s @ 15s

Cable on Sandy Seabed: STABLEpipe

- Applicable for erodible sediments – Sand, Silt and Gravel
- Applies a time model to predict morphological change in seabed through the progression



STABLEpipe – seabed scour

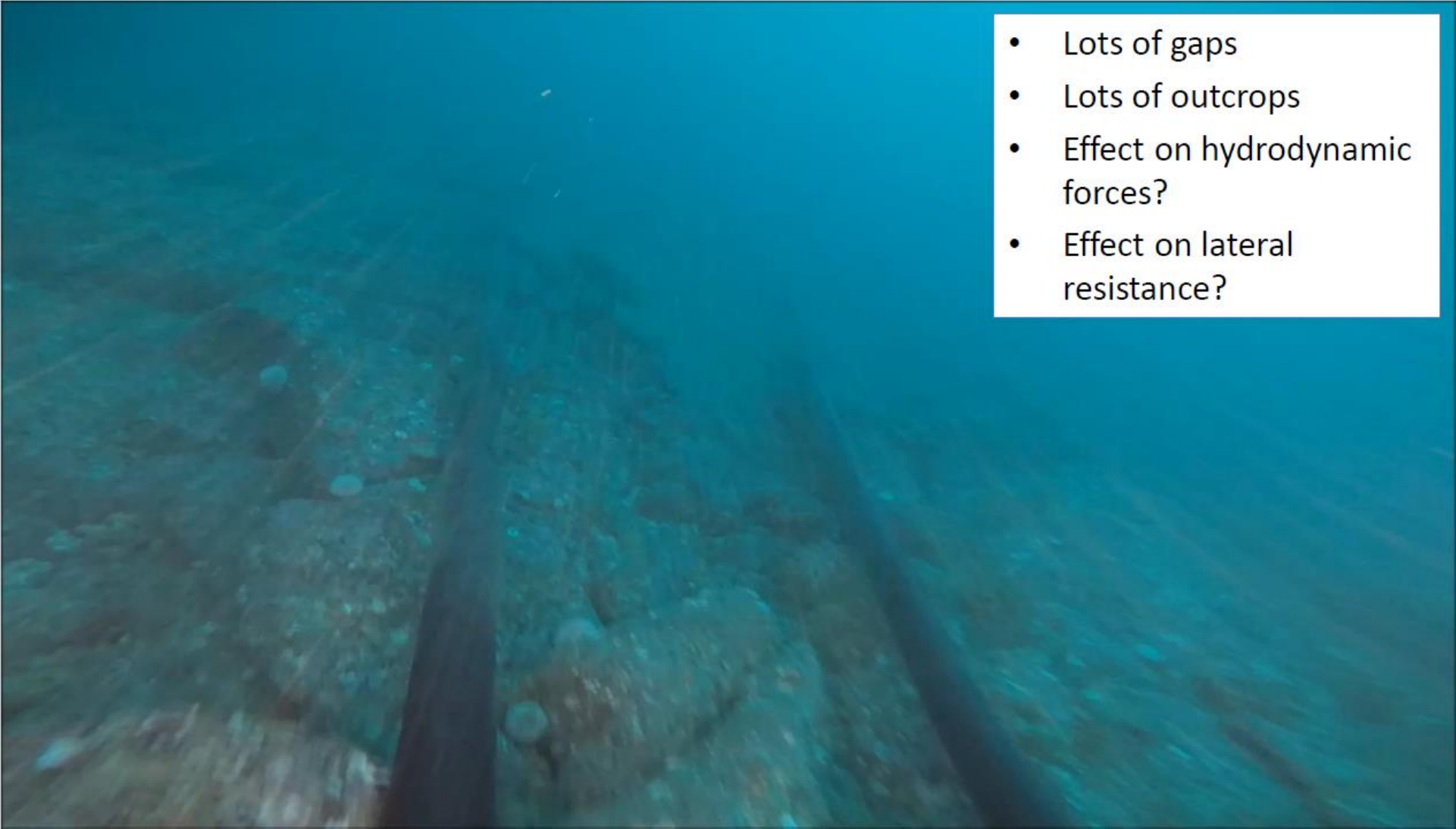


This is real: STABLEpipe



CPS POSITION DIFFERENCE COMPARED TO INSPECTION SURVEY				
	AS-LAID CPS		AS-TRENCHED CPS	
	LATERAL (m)	VERTICAL (m)	LATERAL (m)	VERTICAL (m)
MIN	-0.022	-0.269	0.103	-0.183
MAX	0.203	0.043	0.287	0.155
AVERAGE	0.086	-0.0564	0.228	0.068

Cables on rocky seabeds: COREstab



- Lots of gaps
- Lots of outcrops
- Effect on hydrodynamic forces?
- Effect on lateral resistance?

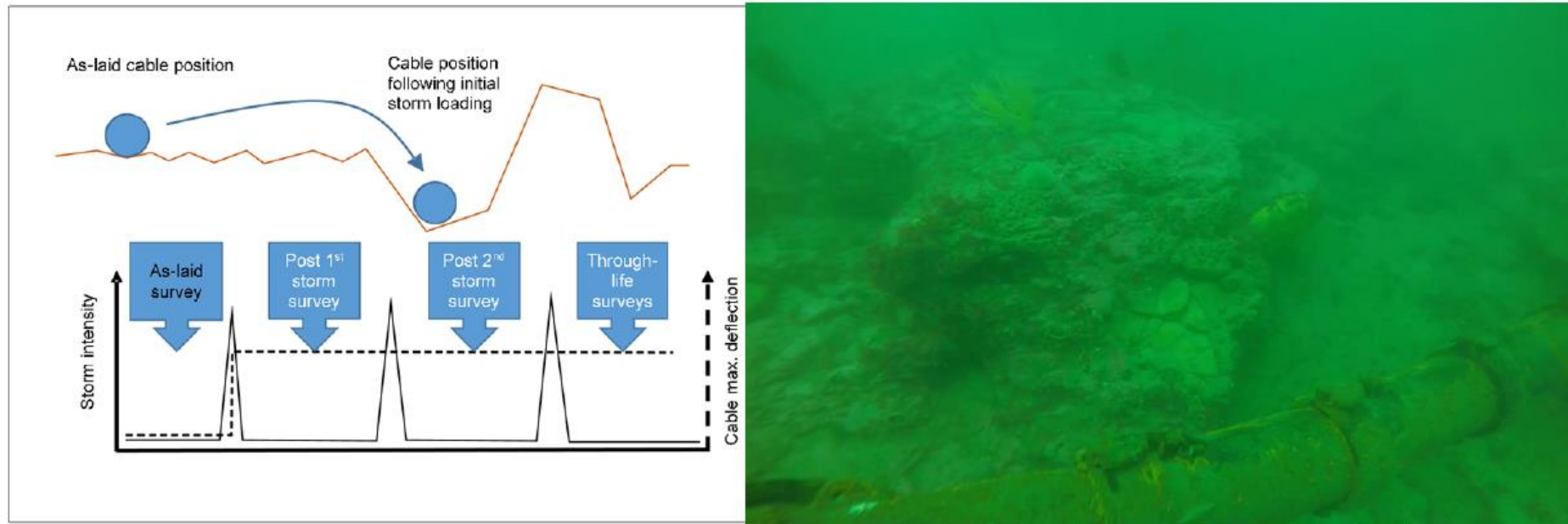
COREstab: Some other benefits

- Incorporation of Cable spans to reduce hydrodynamic forces
- Tests demonstrated lateral friction to be much greater than the 0.6 coefficient in DNV, some rocks have a coefficient of 60 or more.



This is real: COREstab

- Field trials and wind farm array cables show initial one-off movement event under first big storm
- No movement under multiple repeat (larger) storms



Secondary Stabilisation: Filter Units

- Tests to fail: vary model FU on different seabeds
- Examines failure modes and hydrodynamic coefficients



CPS Systems

Oscillatory flow – flow field ($G=0.5D$)

$KC = 20$ case

Oscillating
direction



FU hidden by rolling
horseshoe vortices

* This video was generated by 40G data sampling 20 instant flow fields within one wave period.

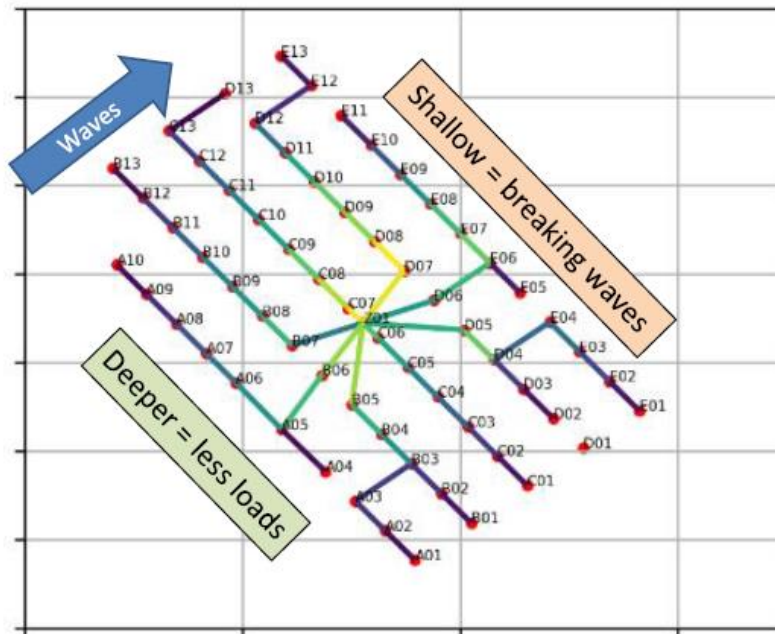
* The computing time for 15 wave periods is 23k CPU hours, equivalent to 12-CPU desktop working nonstop for 80 days.

NPV-Based Cable Reliability

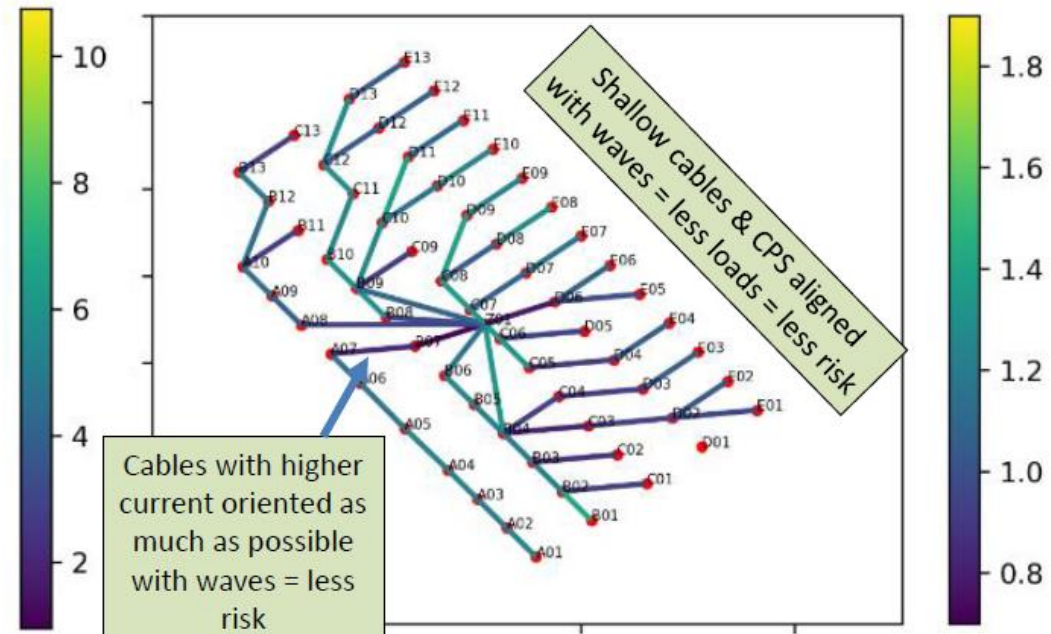
- Route optimisation for metocean risk
- CPS and cables-on-seabed aligned with loads
- Export and central cables more reliable



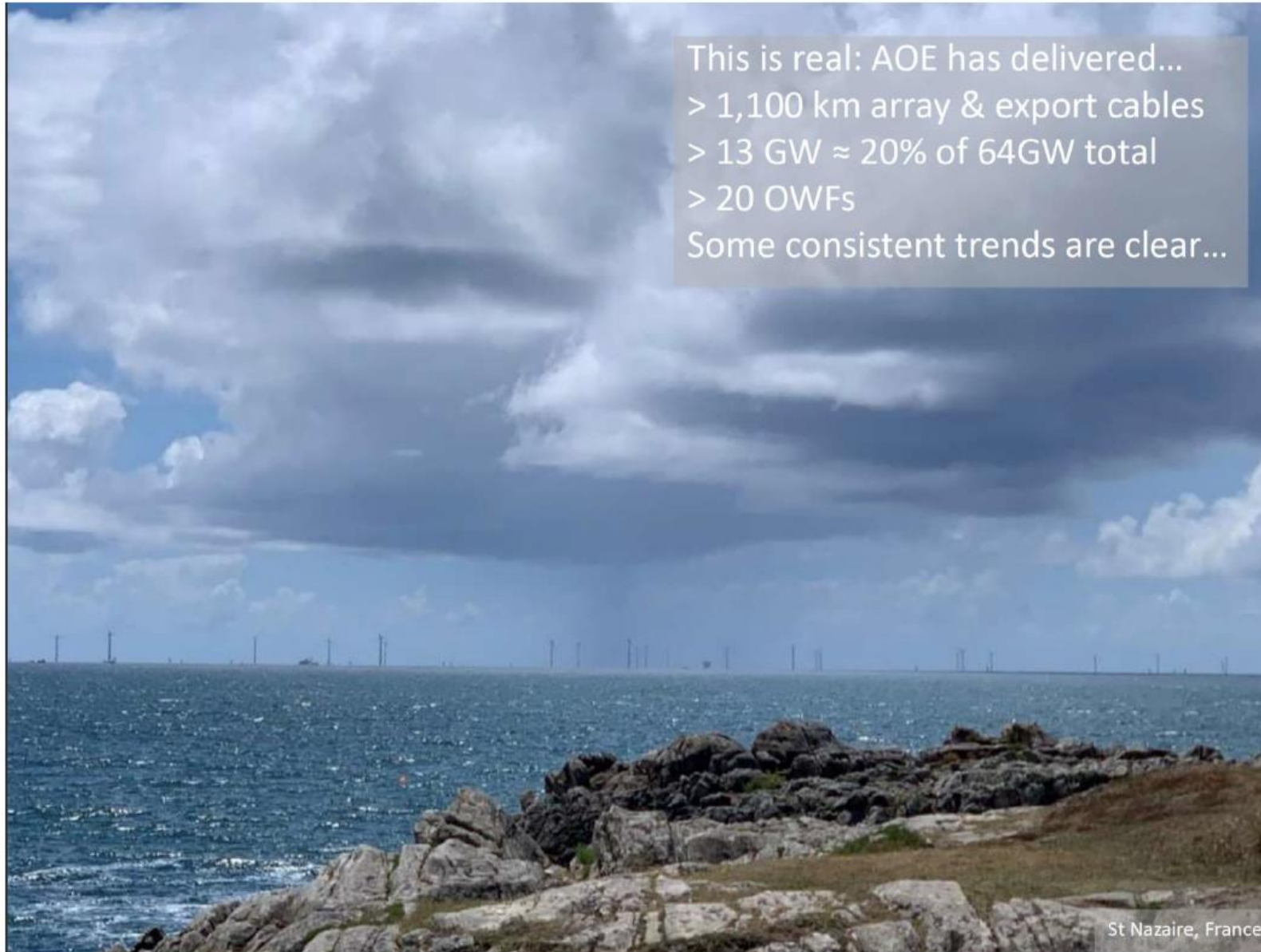
Original layout



Refined layout



Global impact and lessons learnt



This is real: AOE has delivered...

- > 1,100 km array & export cables
- > 13 GW \approx 20% of 64GW total
- > 20 OWFs

Some consistent trends are clear...

St Nazaire, France

Implications for NZ

Applying global cables lessons learnt to NZ:

- Shallow depths severe metocean conditions
- Limestone / calcarenite pavement + veneer of sand
- Oil & gas solutions (mattress) too expensive for wind
- Design approach needs to adapt – not just reuse O&G RPs



Image courtesy taranakioffshorewind.co.nz

Morning Tea

The next session will begin at 11.15am



Melanee Beatson

**Manager Offshore Renewable Energy and Hydrogen
Energy Markets Branch, MBIE**



**MINISTRY OF BUSINESS,
INNOVATION & EMPLOYMENT**
HĪKINA WHAKATUTUKI

Developing a Regulatory Framework for Offshore Renewable Energy

2024 Offshore Renewable Energy Forum

20-21 March 2024, Hāwera



Overview of presentation

- **Indicative timelines** for offshore renewable energy regime
- Key outcomes from **consultation process**



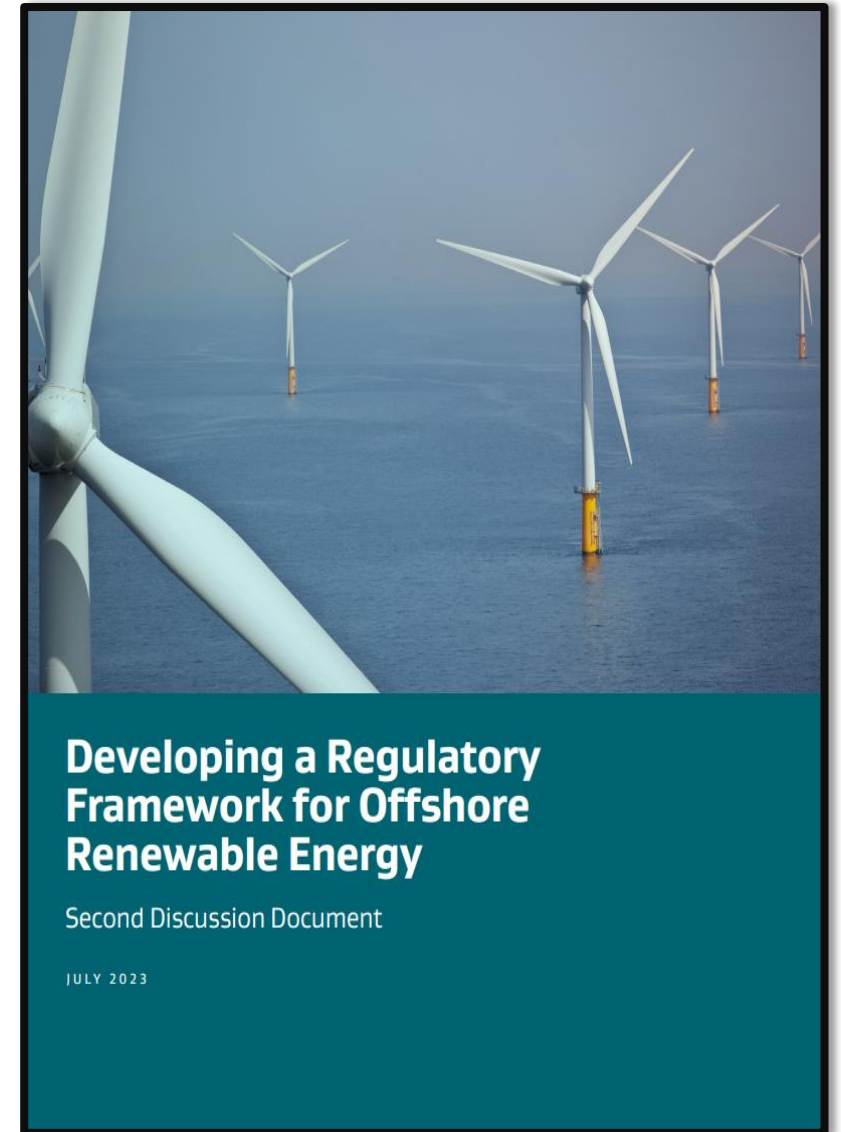
Indicative timelines

- Agreed priority under Electrify New Zealand



Consultation outcomes

- MBIE undertook two phases of public consultation:
 - **Phase one** focused on enabling feasibility studies and proposed the introduction of a feasibility permit (from December 2022)
 - **Phase two** focused on the broader regulatory regime and measures to enable the construction and operation of infrastructure (August–November 2023)

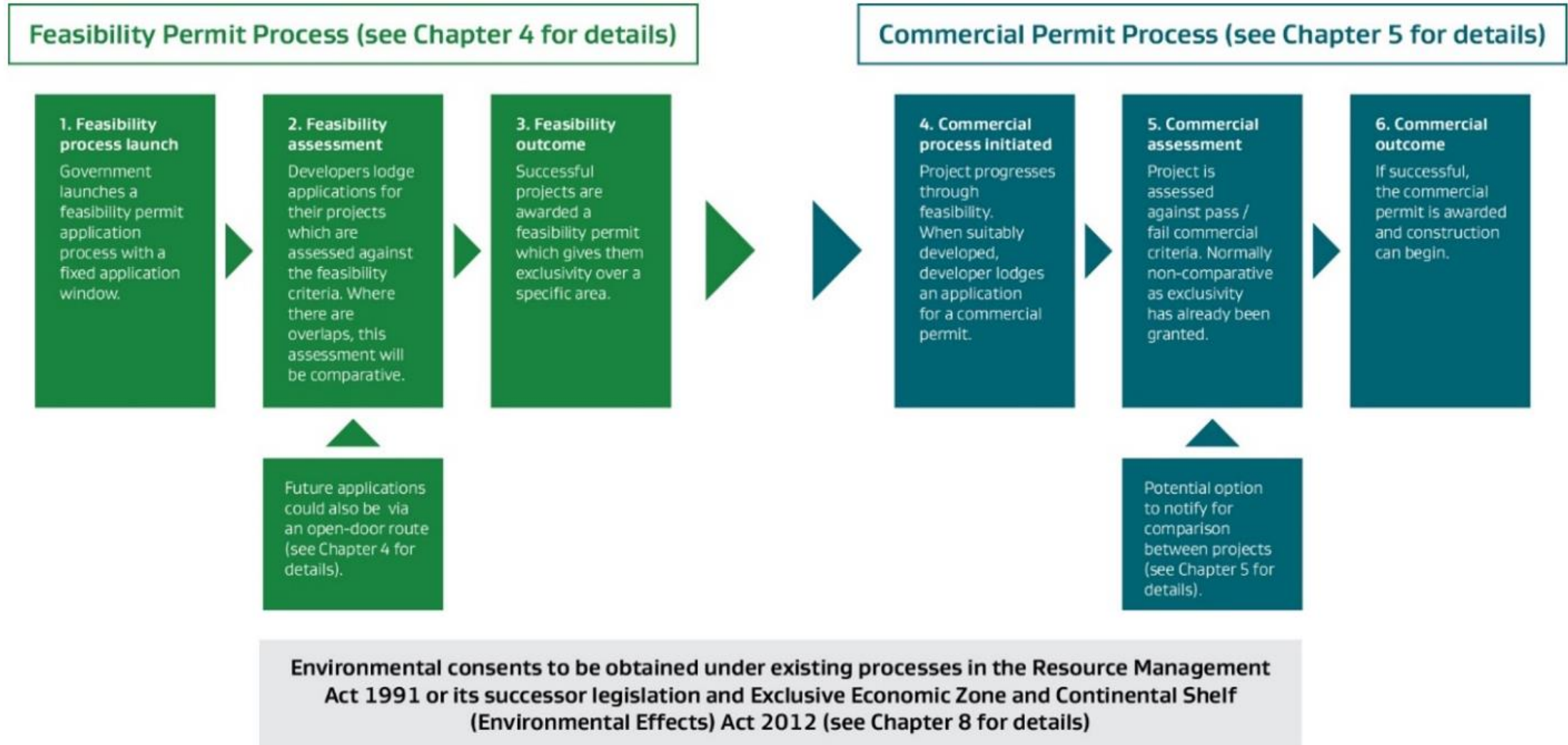


Overview of proposed regime

- The regime aims to:
 - give developers greater **certainty to invest** in developing projects
 - enable the selection of developments that **best meet New Zealand's national interests**
- The core proposal is that developers will need two permits:
 - **A feasibility permit**
 - Maximum duration 7 years, with “use it or lose it” provisions
 - Gives the exclusive right to apply for a commercial permit in the relevant area
 - Comparative assessment
 - **A commercial permit**
 - Maximum 40 years
 - Enables construction and operation of offshore renewable energy infrastructure
- Developers will also need environmental consents (EEZ, RMA) and other approvals (e.g. Overseas Investment Act, Maritime Act)
- Regime to enable iwi and hapū engagement



Overview of proposed regime (consultation version)



We received over 50 submissions



Over the two consultations, we have received 110 written submissions on the proposals for regulating offshore renewable energy developments. We also received feedback from in-person meetings, a cross-sector workshop, and workshops on specific issues.



This feedback reflects the views of energy industry stakeholders (including those directly involved in offshore renewable energy developments), iwi and Māori organisations, environmental advocacy groups, local governments and regional development organisations.



Many submitters on the regime also provided information on the overall strategic case for offshore renewables and participated in the broader energy transition consultations in 2023.

What we heard

Permits

Broad support for the overall regime and direction

Acknowledgement needs to be as fast as possible, but also needs to be right

No open-door process, just rounds

No comparative process at the commercial stage

Broad support for permit criteria

Consideration of environmental credentials (feasibility stage)

Strong support for iwi and hapū participation in the regime

What we heard

Wider regulatory regime

Transmission – support for a hybrid model

Decommissioning – general support for overall proposal...

...but strong opposition to trailing liability

Safety zones – general support



Thank you.

Ministry of Business, Innovation & Employment
www.mbie.govt.nz



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Lauren Wallace

Partner, GQ

FAST TRACK APPROVALS

Lauren Wallace
Partner





- The 'Fast-track Approvals Bill' was introduced and received its first reading under urgency on 7 March 2024.
- Submissions close on Friday, 19 April 2024



Fast-track approvals Bill 'smells bad'

Otago Daily News, Saturday 16 March 2024

The government's war on nature goes nuclear

Environmental Defence Society, 07 March 2024

The government's fast-track legislation is an anti-environment approach that will make New Zealand a "banana republic"

Labour Party, 7 March 2024

Fast-track bill cuts red tape strangling innovation

Straterra, 7 March 2024

Fast-tracking projects would "provide certainty to a nervous infrastructure sector and an expectant public" and help overcome the infrastructure deficit.

NZ Infrastructure Commission, 7 March 2024

"Whether it is roads, public transport, hospitals or schools, we need to get spades into the ground quicker and the fast-track regime will help us do that."

Employers and Manufacturers Association, 7 March 2024



Fast-track not a new concept

- COVID-19 Recovery (Fast-tracking Consenting) Act 2020
- Natural and Built Environment Act 2023 (NBA)
- RMA (Post NBA Repeal)

Purpose - FTA Bill

To provide a fast-track decision-making process that facilitates the delivery of infrastructure and development projects with significant regional or national benefits.



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Purpose of the COVID-19 Recovery (Fast-track Consenting) Act

The purpose of this Act is to urgently promote employment to support New Zealand's recovery from the economic and social impacts of COVID-19 and to support the certainty of ongoing investment across New Zealand, while continuing to promote the sustainable management of natural and physical resources.



Purpose - FTA Bill

To provide a fast-track decision-making process that facilitates the delivery of infrastructure and development projects with significant regional or national benefits.



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One-stop shop

- **Resource Management Act 1991**
- **Wildlife Act 1953**
- **Conservation Act 1987**
- **Reserves Act 1977**
- **Freshwater Fisheries Regulations 1983**
- **Heritage New Zealand Pouhere Taonga Act 2014**
- **Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012**
- **Crown Minerals Act 1991**
- **Public Works Act 1981**



There has been limited analysis on the inclusion of non-RMA legislation and no consultation on it

There has been limited analysis on the inclusion of non-RMA legislation

Due to time constraints, there has been very limited analysis on the problem definition associated with conservation, heritage and public works legislation. No analysis has been provided by the Department of Conservation for the SAR on the conservation approvals contained in the fast-track regime.

While there appears to be general consensus among infrastructure providers and developers that multiple approvals processes can be costly and time-consuming, the challenges/barriers posed specifically by conservation and heritage approvals are not well understood. There may be negative impacts on conservation land and wildlife outcomes which have not been quantified.

There has been limited analysis on the proposed changes to non-RMA legislation designed to enable more development, including the impacts of enabling greater development on public conservation land. This creates significant risks for achieving the Government's wider objectives. For instance, there will be impacts on the conservation values of public conservation land. The potential benefits to development and the impacts upon conservation are not well understood. Many issues in the public works legislation involve balancing competing interests between delivering public infrastructure and private property rights, which need further exploration.

There has been limited analysis on the problem definition associated with the public works legislation. Any issues in the public works legislation involves balancing competing interests between delivering public infrastructure and private property rights which requires careful consideration.

The changes proposed to the Fisheries Act were a late addition to the fast-track bill and have not been considered further in the SAR due to the time available for analysis.

hei kai wakarite ki nga Tangata maori o Nu Tirani - kia wakaritia e nga Rangatira maori te Kawanatanga o te Kuni ki nga mahikatanga o te wenua nei me nga motu - na te mea hoki he tokomaha ke nga Tangata o tona Iwi Kua noho ki te nei wenua, a e haere mai nei.

Na ko te Kuni e hihia ana kia wakaritea te Kawanatanga kia kua ai nga kino e puta mai ki te Tangata Maori ki te Pakeha e noho tene kore ana.

Na, kua pai te Kuni kia tukua a hau a Wiremu Hopihona he Kapitana i te Roiara Nawi hei Kawana mo nga wahie katoa o Nu Tirani e tukua aianei. amua atu ki te Kuni, e mea atu ana ia ki nga Rangatira o te wakaninunga, nga hapu, Nu Tirani me era Rangatira atu e nei tene ka koreroia nei.

Ko te tuatahi

Ko nga Rangatira o te wakaninunga me nga Rangatira katoa hoki ki hai i waihi tene wakaninunga ka tukua rawa atu ki te Kuni o Ingarani ake tonu atu - te Kawanatanga katoa o o ratou wenua.

Ko te tuarua

Ko te Kuni o Ingarani ka wakarite ka wakarite ki nga Rangatira ki nga hapu - ki nga Tangata katoa o Nu Tirani te tino rangatiratanga o ratou wenua o ratou kaiinga me o ratou taonga katoa. Otira ko nga Rangatira o te wakaninunga me nga Rangatira katoa atu ka tukua ki te Kuni te hokonga o era wahie wenua e pai ai ki te Kuni me te hoko e meatia nei e te Kuni hei kai hoko mona.

Ko te tuatoru

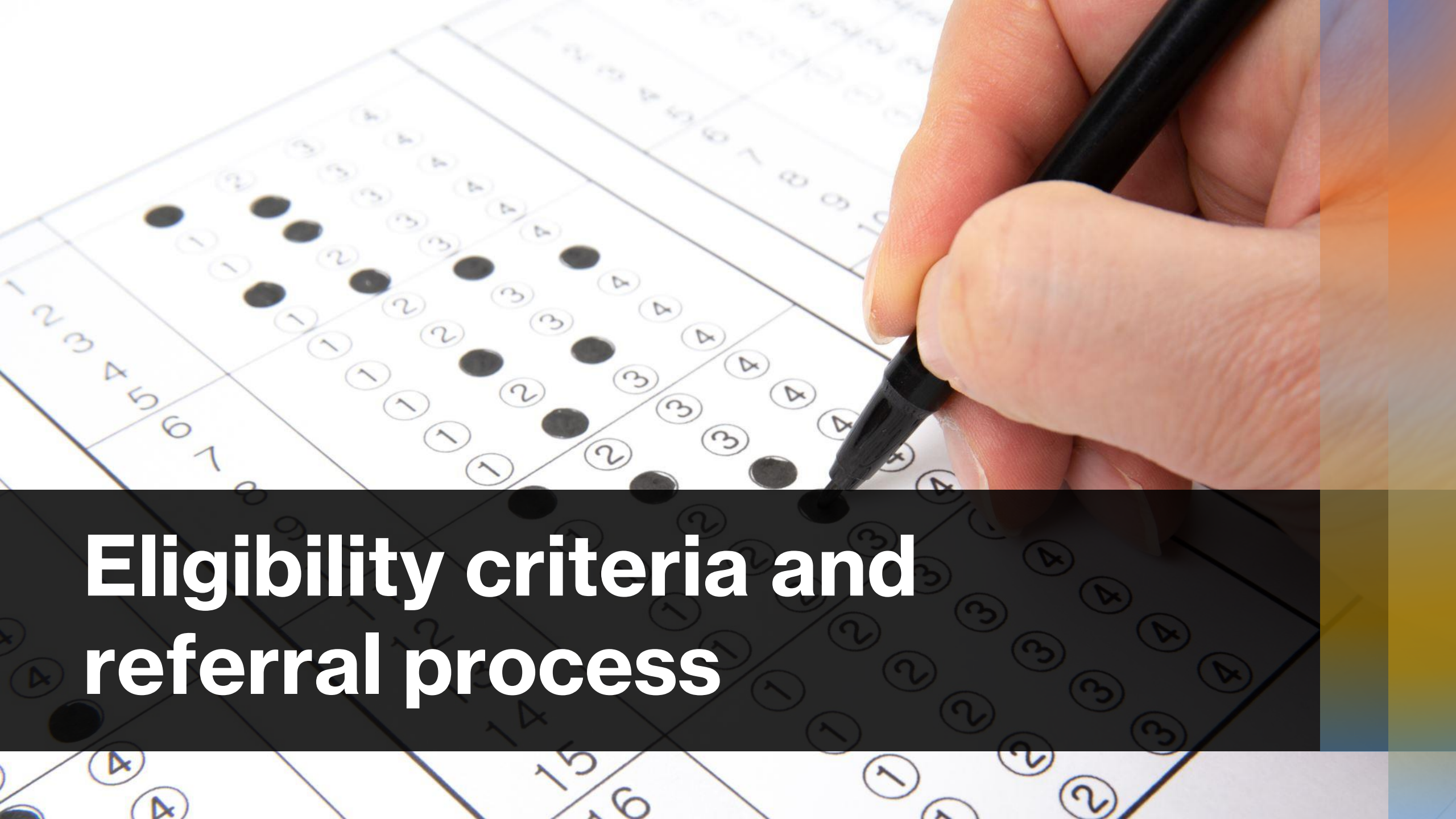
Na ko matou ko nga Rangatira o te wakaninunga o nga hapu o Nu Tirani ka huihui nei ki Waitangi ko matou hoki ko nga Rangatira o Nu Tirani ka kite nei i te ritenga o enei kupu. Ka tangohua

Waitangi ko matou hoki ko nga Rangatira o Nu Tirani ka kite nei i te ritenga o enei kupu. Ka tangohua

mea ki nga Tangata o Ingarani.

Consul & Lieutenant Governor





Eligibility criteria and referral process

Referral process

Part A Listed Project

- No referral required
- Application lodged with EPA to refer directly to expert panel

Part B Listed Project

- Considered to have significant regional or national benefits
- May be referred to expert panel

Other eligible non-listed Projects

- May be referred to expert panel by Joint Ministers if eligible

Eligibility criteria for projects to be referred

The joint Ministers must consider the following criteria:

- a) whether referring the project is consistent with the purpose of this Act:
- b) whether access to the fast-track process will enable the project to be processed in a more timely and cost-efficient way than under normal processes:
- c) the impact referring this project will have on the efficient operation of the fast-track process:
- d) whether the project would have significant regional or national benefit.

Ineligible projects

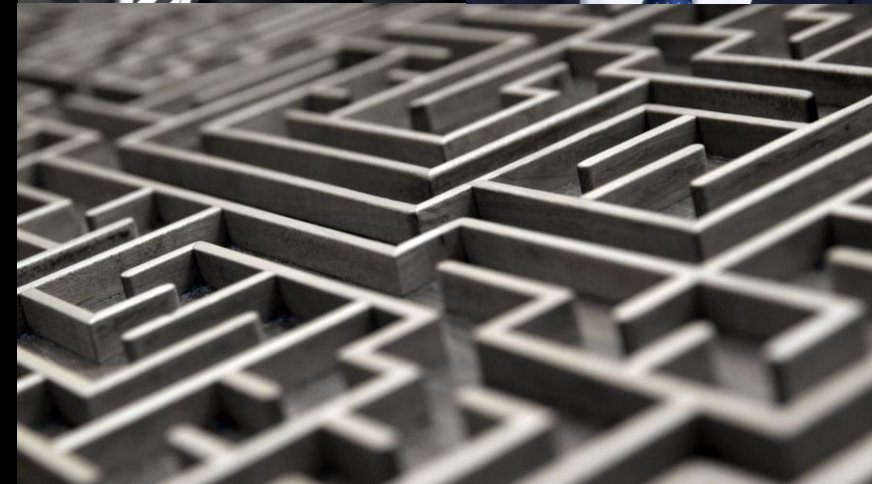
- Projects occurring on land returned under a Treaty settlement
- Prohibited activities under the EEZ Act
- Decommissioning-related activities within the meaning of the EEZ Act
- Offshore renewable energy projects that being before separate offshore renewable energy permitting legislation comes into force.
- A project is not ineligible just because the project includes an activity that is a prohibited activity under the Resource Management Act 1991.

Offshore energy

Role of the expert consenting panel



Who makes the final decision?



Consultation requirements

Mandatory consultation for Ministerial referral process:

- A. Applicants must consult pre-application
- B. Ministers must consult pre-referral decision
- C. Invitation to comment during expert panel process



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Appeal rights

- Questions of law only
- Limited persons can appeal to High Court
- One further appeal to SC or CA
- Judicial review available



Summary and next steps



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Steve Canny

General Manager Strategic Projects, Great South

Southland's Energy Pathway

Southland Murihiku Regional Energy Strategy 2022 to 2050 – Southland Case Study

Presentation to
Offshore Renewable Energy Forum

March 2024

Fundamental Approach

- **Have a robust Energy plan that is bankable**
- **Identify Energy Demand and the location of demand**
- **Aim for Energy Balance**
- **Identify New Renewable Energy Opportunities**
- **Ensure that grid and local area network supports new demand & renewable energy investment**
- **Reduce planning and consent risks**
- **Promote investment**
- **Measure progress**

Southland's Statistics

- 11.7% of all New Zealand's Agricultural exports
- 8.1% of New Zealand's manufactured goods exports &
- 70% of its \$7.3 b GDP is dedicated to exports. Highest exports per capita.
- 103,900 Population +1.4% annual growth
- 12% of NZ's total land area
- 58% of the land area is Conservation Estate
- Highest CO2e emissions per capita – 7.3mt CO2e
- As an export economy the need to remain globally competitive in a New Zealand setting
- Insulate business against the cost of carbon
- Affordable renewable energy and efficient transport is essential
- Low carbon value added processing enables access high value markets

Energy Planning

Renewable Energy



Southland Murihiku Regional Energy Strategy 2022-2050

Prepared for Great South
by Beca Limited

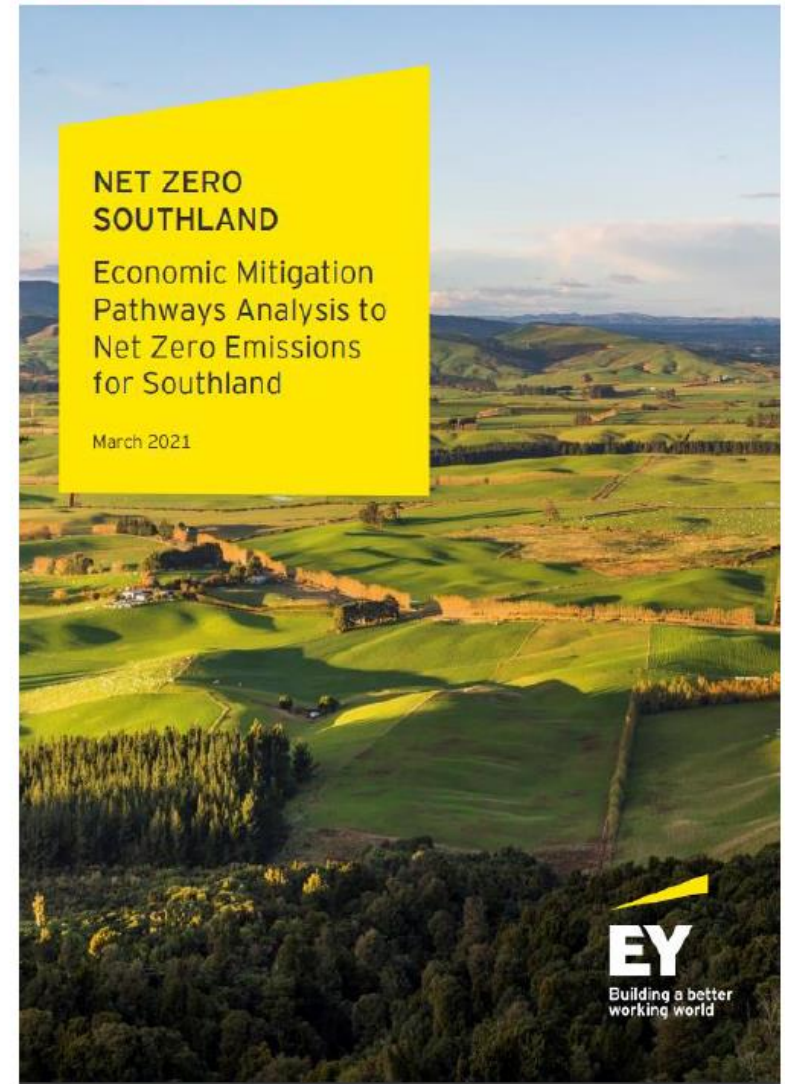
31 March 2023



Creative people together transforming our world

The vision for the strategy is: “Energy in Southland Murihiku is clean, resilient and affordable supporting a thriving community” The purpose of the strategy is to articulate the current and future demand and supply of energy in Southland Murihiku, considering the immediate and long-term challenges and opportunities the region faces.

Decarbonisation



Southland Regional Energy Strategy 2022 to 2050

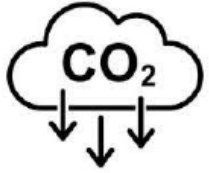
- 4th Regional Energy Strategy 2002, 2005, 2011
- **Unprecedented demand for Renewable Energy -**
Decarbonisation, electricity-based transport & new investment
- **Energy efficiency is a priority**
- **Energy Sources – Electricity, wood, biogenic methane, hydrogen**

Net Zero Southland report - Aims

Aim to achieve 'carbon zero' by 2050 without economic and social shock

- Southland can achieve net zero by 2050 with a positive net financial and environmental outcome.
- Technology and Agricultural pathways have been modelled to reducing emissions
- Emissions reduction will require action across all sectors.
- Decarbonisation requires access to reliable & affordable renewable energy
- A key objective is to maintain access to high value Export Markets

Carbon – Abatement (Thermal Energy Red)



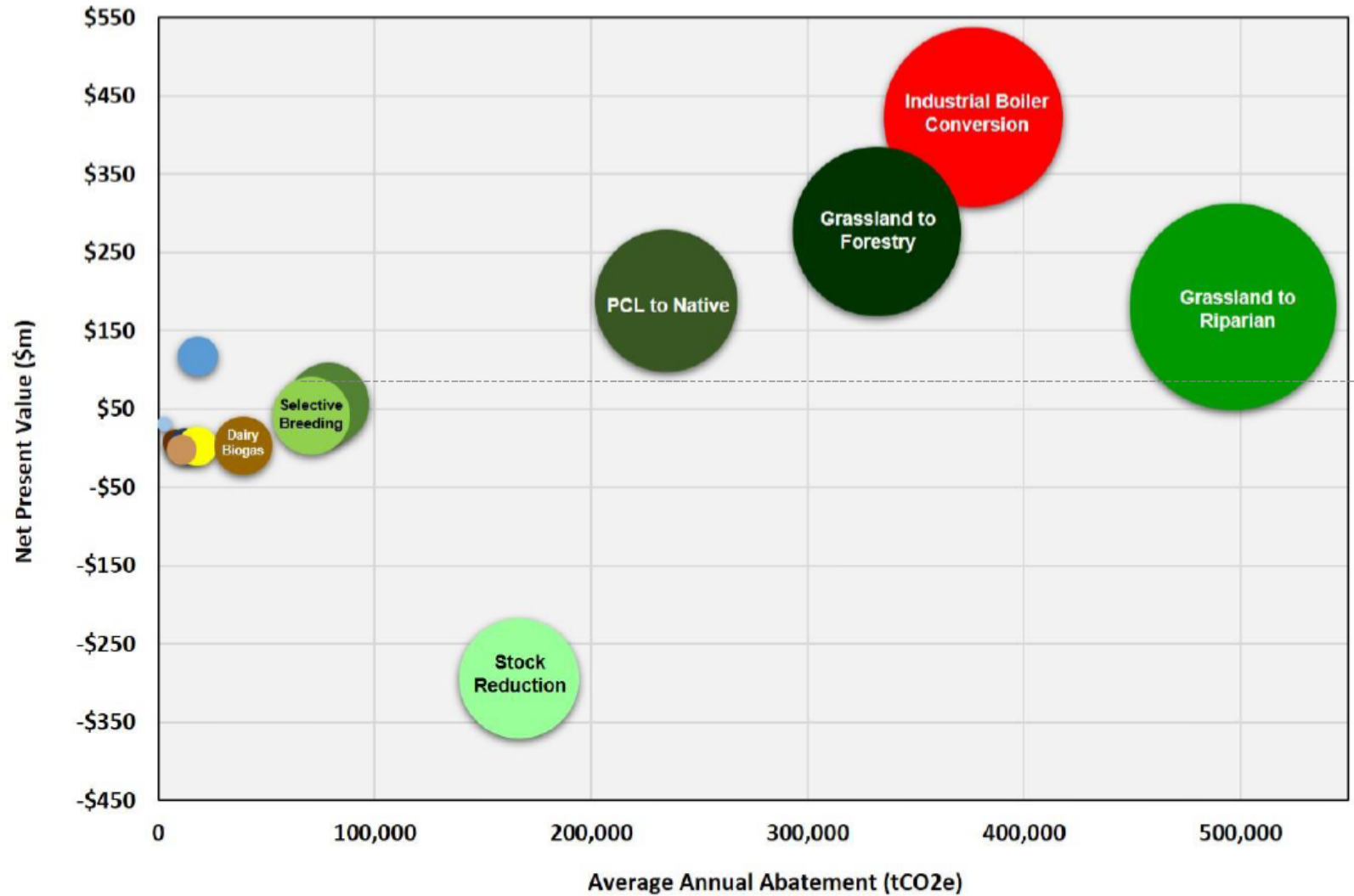
Baseline for carbon reduction established for Southland



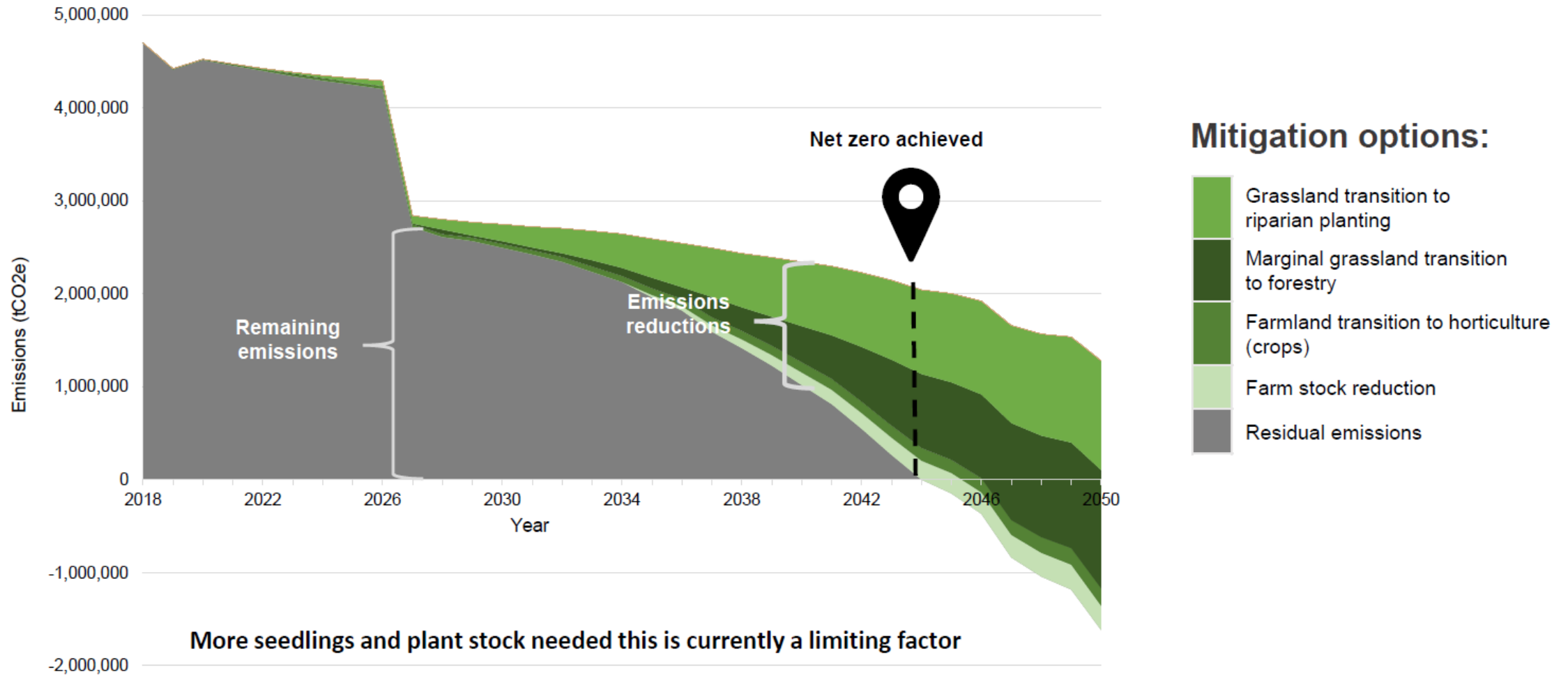
Economic impact quantified



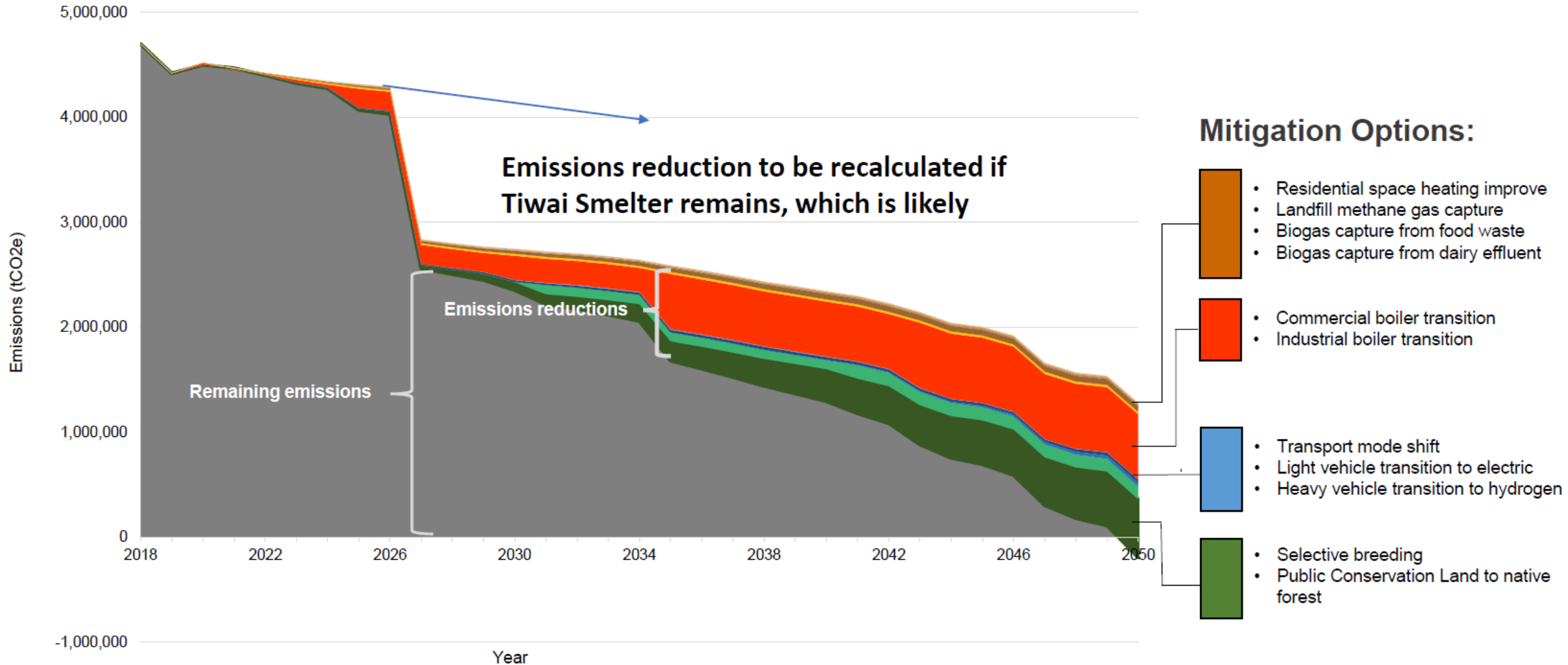
Potential options show how emissions can be reduced across all sectors



Modelled Options Pathway 2



Modelled Options Pathway 1



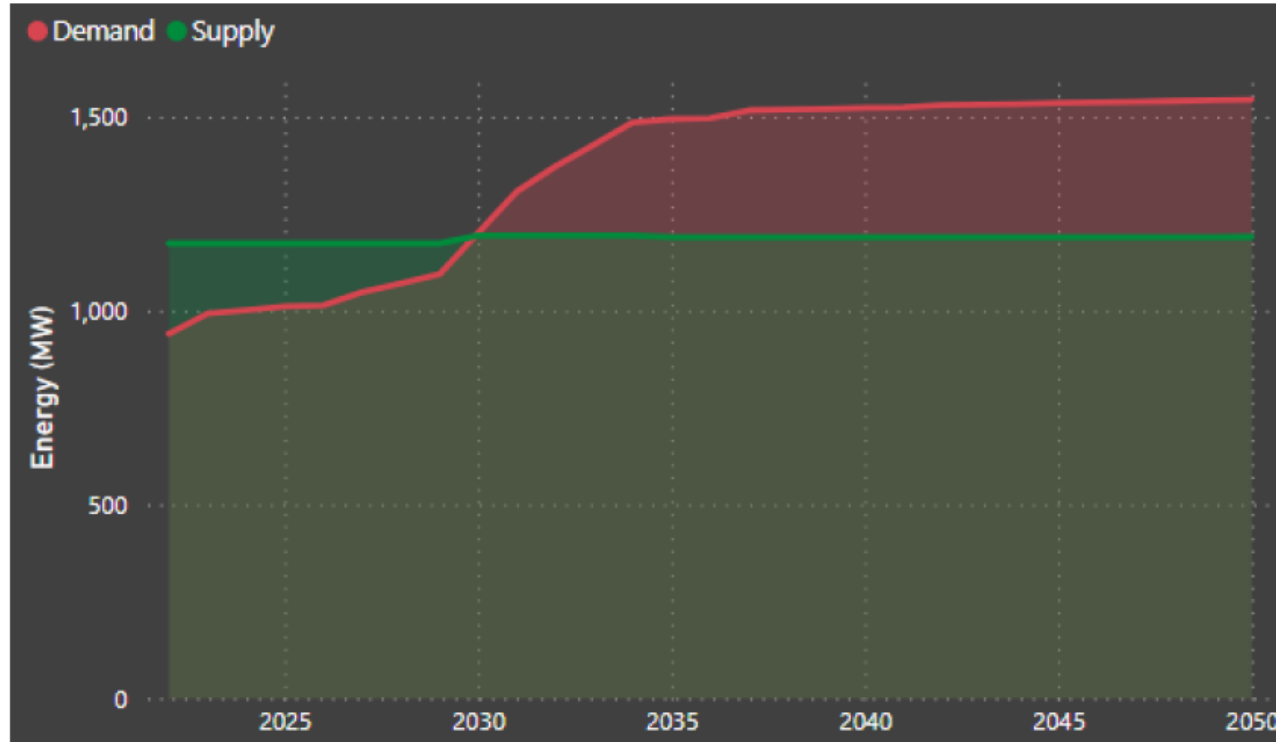
Accurate Assessment of Energy Demand

- Decarbonisation Demand
- Transport Demand
- New Industry Investment
- Energy efficiency gains

- Energy types
 - Electricity – 2023 940MW Demand
 - Woody Biomass - 2023 market 200,000mt to 2030 555,000mt
 - Biogenic Methane - LPG substitute fuel 310 TJs

Accurate Assessment of Energy Demand

- Electricity Demand – Tiwai Smelter remains & Southern Green H2 is developed






Year	Demand (MW)	Supply (MW)
2022	940	1173
2030	1200	1194
2035	1494	1189
2050	1544	1190

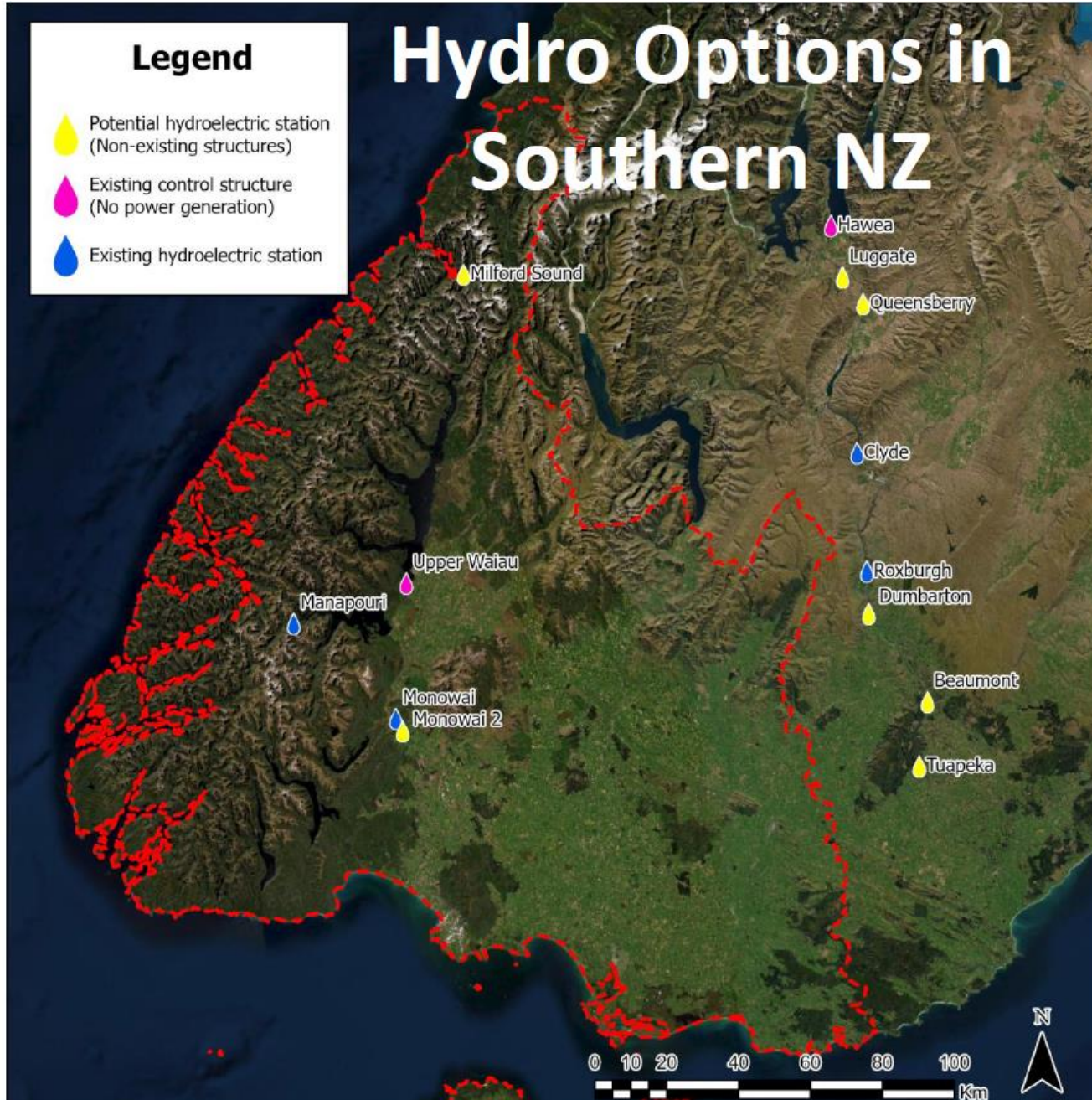
Electricity Generation Opportunities

- It is likely that most regions in New Zealand will require more renewable electricity.
- To ensure the increased probability of price stability, it is desirable to have a match between demand & supply of electricity.
- Investment in intermittent generation from Wind and Solar.
- There are also stronger demands for an increase in base generation from Run of River Hydro generation.
- Greater demand improved peak load management and the deployment of battery systems.
- EDB's will have a major role in load management.
- Generation can occur anywhere, but grid support is critically important
- Generation close to demand has significant benefits.
- Identify new renewable generation investment – 'Energy in the Landscape'

Legend

-  Potential hydroelectric station
(Non-existing structures)
-  Existing control structure
(No power generation)
-  Existing hydroelectric station

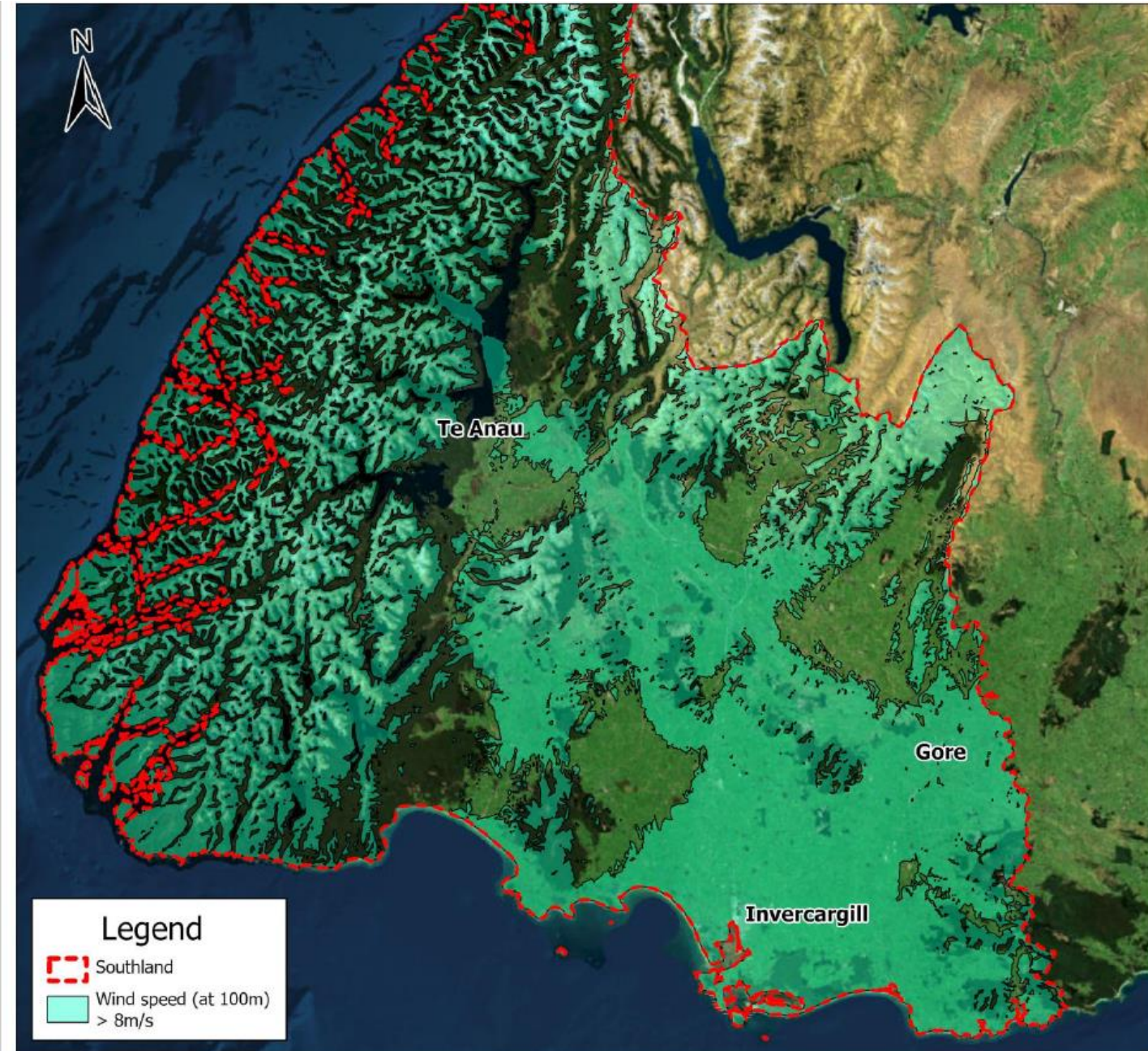
Hydro Options in Southern NZ



The maps below are excerpts of the wind modelling prepared by Great South for the Southland Murihiku Energy Strategy. These wind site prospects have been identified utilising a Global Wind modelling tools and Geographic Information Systems which indicate the locations where commercial wind speeds may be available and are possibly worthy of further detailed investigation.

Identification of potential sites is the preliminary phase of the wind planning process and is by no means an indication that a project is culturally, environmentally, or commercially viable.

There five principle factors for consideration when developing a commercial windfarm. These are electricity demand, technical requirements, iwi support & cultural considerations, environmental considerations, availability of transmission infrastructure, financial viability and of course land availability. Technical requirements include the available of measured wind at commercial velocities, geotechnical suitability of the land for construction, site access, ability to consent the project, and the capacity of the contiguous grid infrastructure.



New Generation Plains Areas

Introductory note

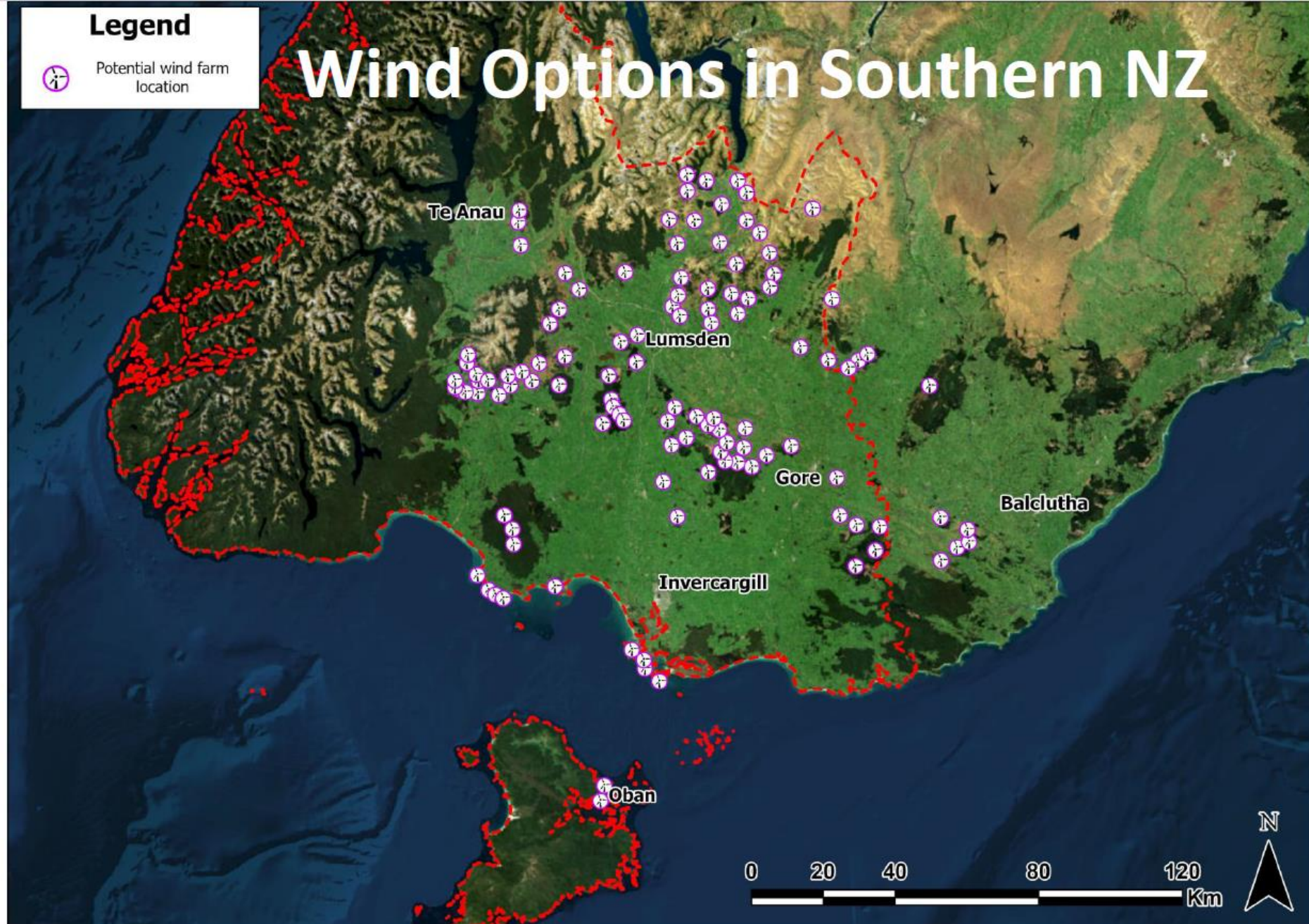
- Lands within the Conservation Estate or culturally environmentally sensitive sites are not regarded as appropriate prospects and focus should consider prospects within modified landscapes.
- There are **112 prospective hilltop sites that have been assessed** in Southland, however this does not mean that all or any of these site are likely to be developed. The reality is that even with a significant forward demand electricity only a handful of the most commercially viable and consentable wind projects are likely to be developed.

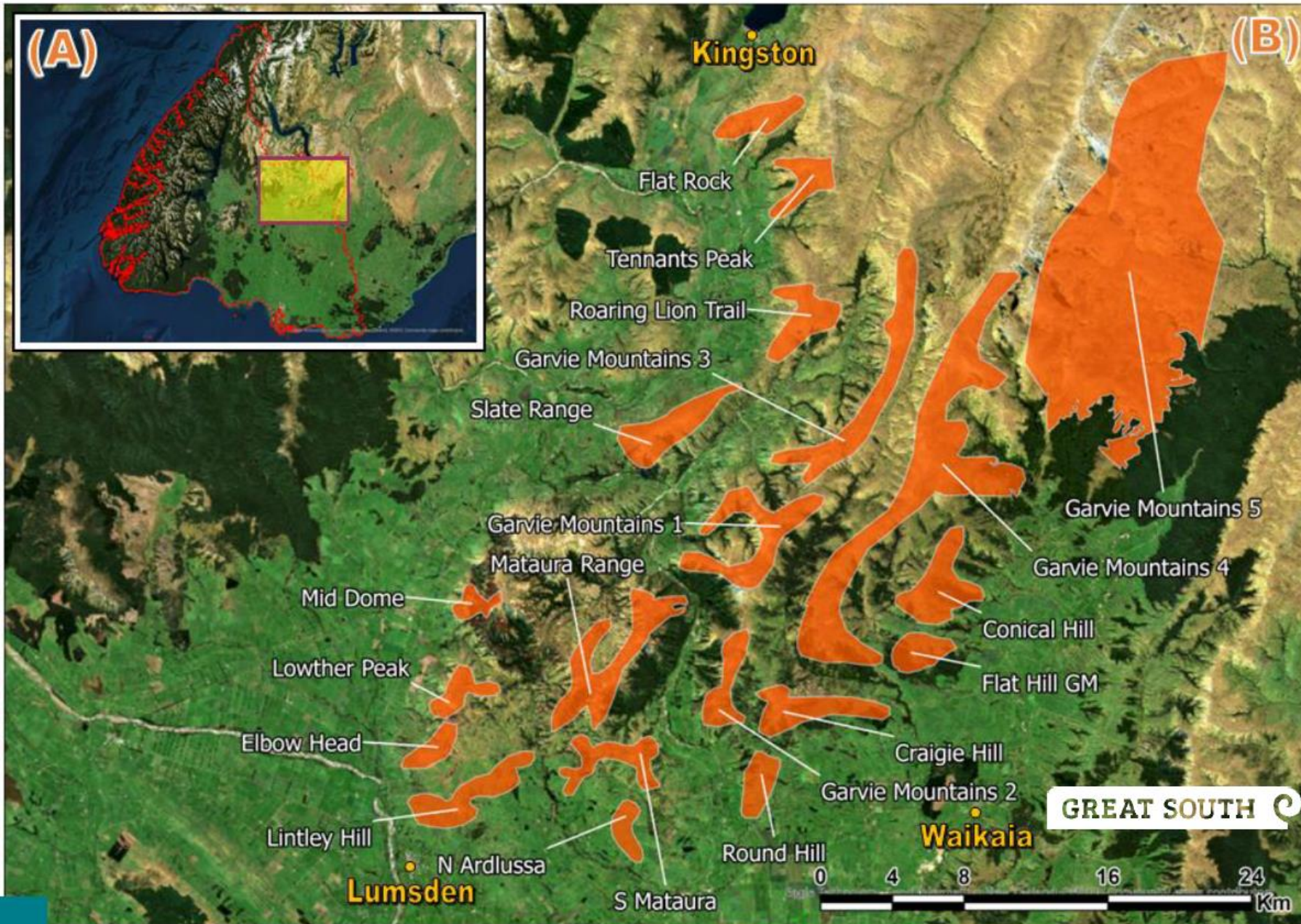
Legend



Potential wind farm location

Wind Options in Southern NZ

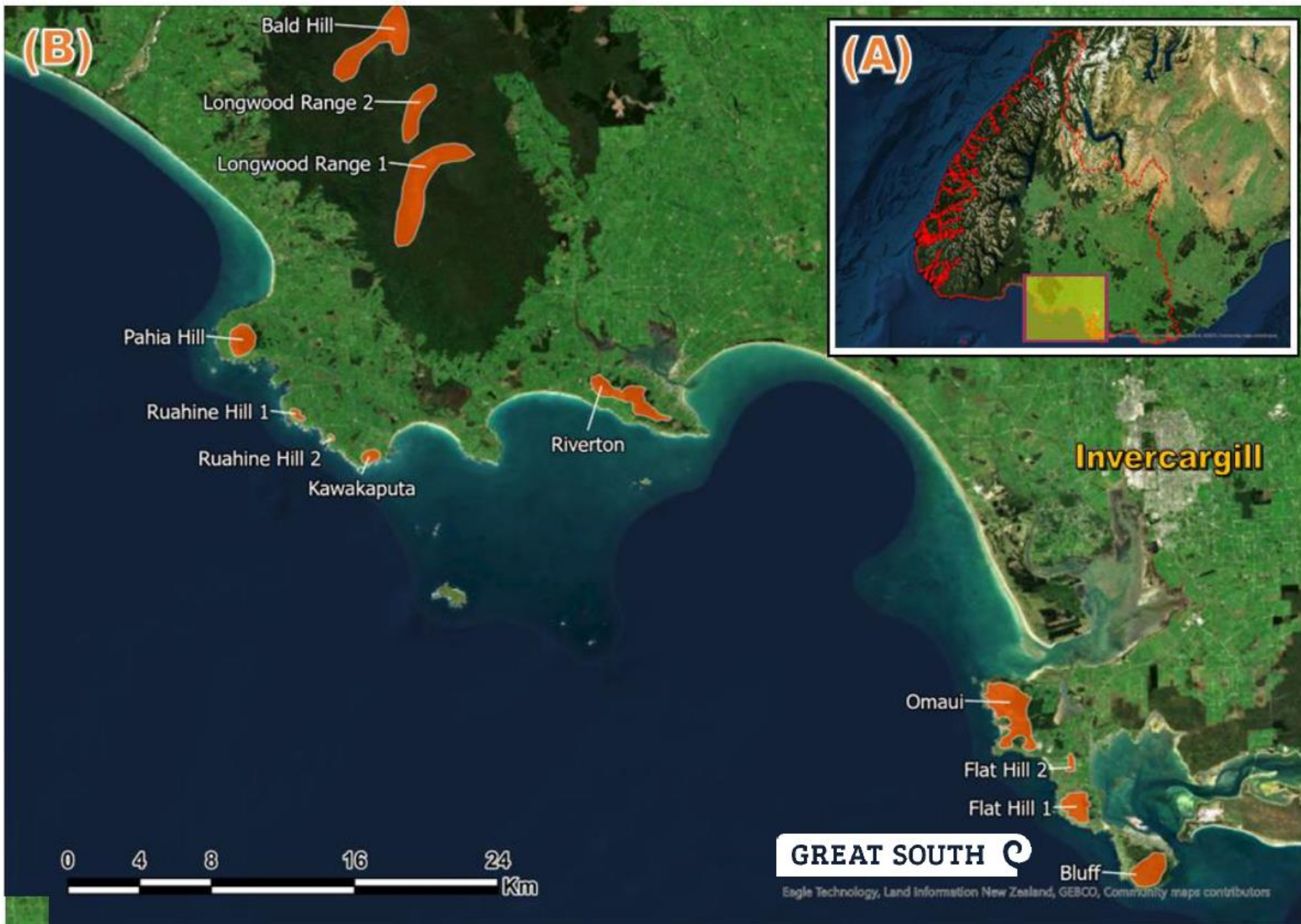




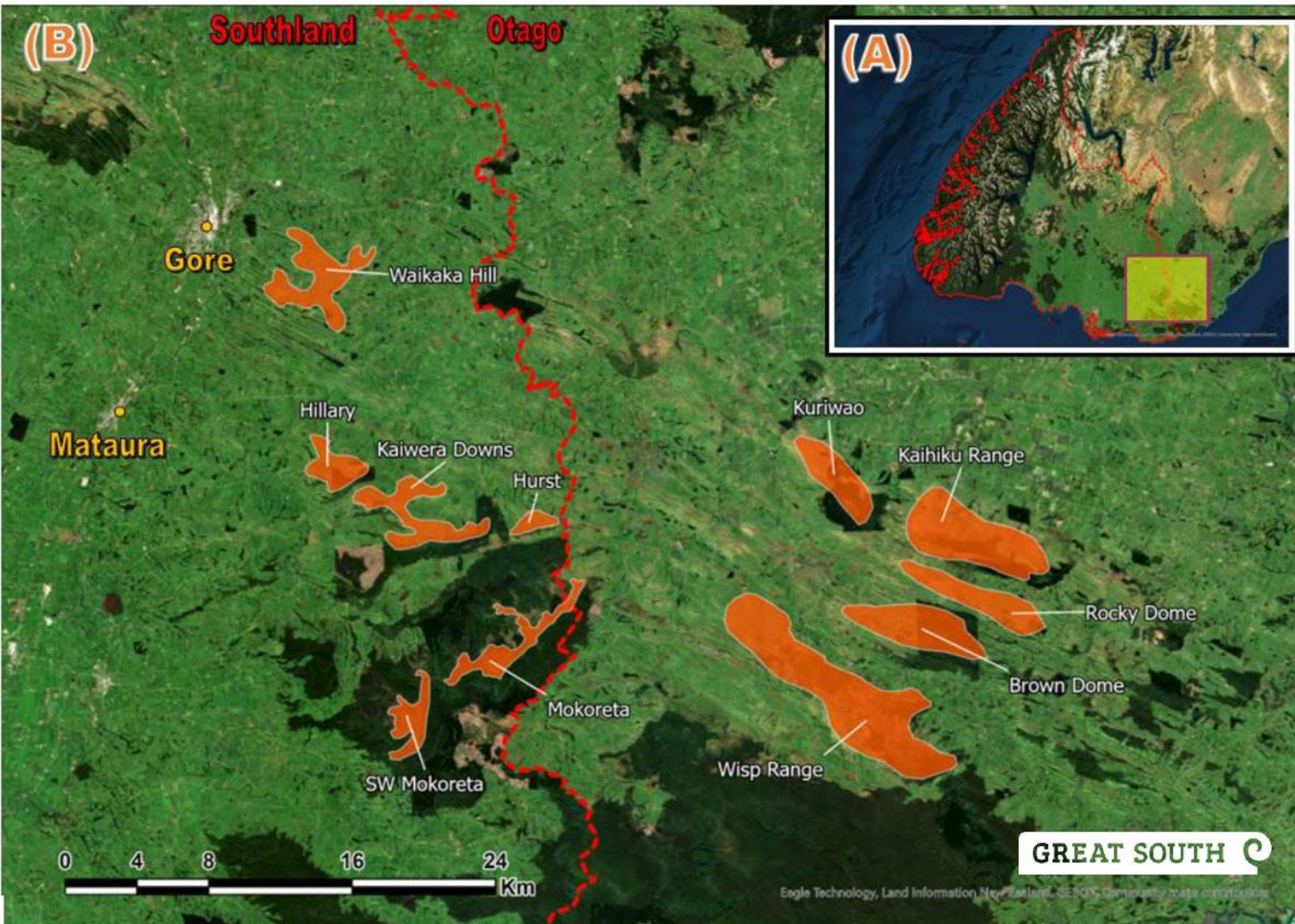
	Sub-region / Potential location name	Wind Speed (m/s)	Power density (W/m ²)
Garvie Mountains			
1	Conical Hill	10.3	2441
2	Craigie Hill	10.32	2179
3	Elbow Head	9.75	1592
4	Flat Hill GM	9.72	2225
5	Flat Rock	11.45	2364
6	Garvie Mountains 1	11.01	2407
7	Garvie Mountains 2	11.42	2507
8	Garvie Mountains 3	12.11	2914
9	Garvie Mountains 4	11.96	2938
10	Garvie Mountains 5	11.66	2404
11	Lintley Hill	9.75	1576
12	Lowther Peak	10.29	1870
13	Mataura Range	11.05	2249
14	S Mataura	10.28	1879
15	Mid Dome	10.35	1898
16	N Ardlussa	9.54	1573
17	Roaring Lion Trail	10.25	1932
18	Round Hill	9.64	1708
19	Slate Range	9.16	1537
20	Tennants Peak	10.56	1788



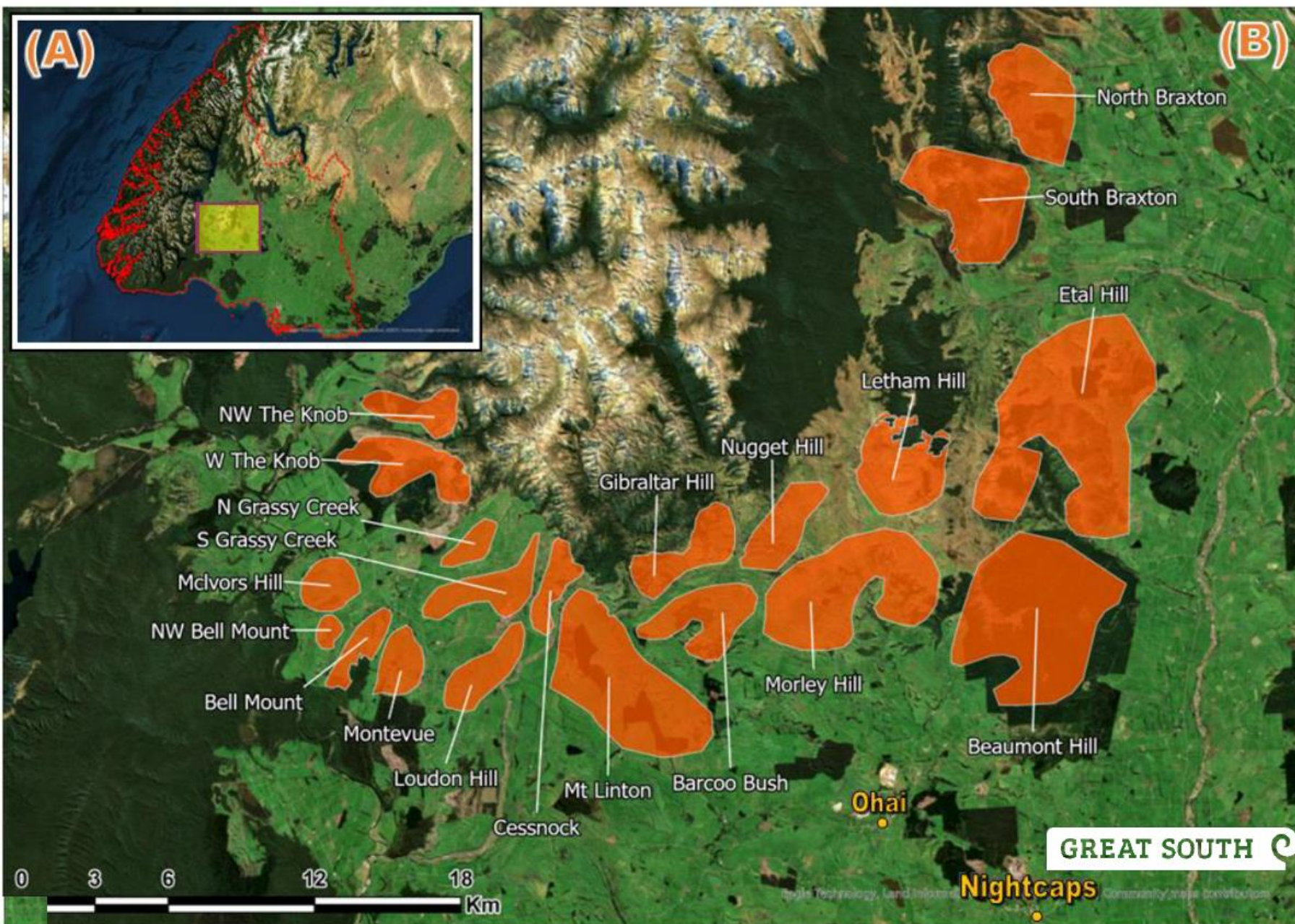
Sub-region / Potential location name		Wind Speed (m/s)	Power density (W/m ²)
Hokonui Hills			
1	Bare Hill 1	10.96	1498
2	Bare Hill 2	10.78	1552
3	Ben Bolt	10.65	1609
4	Ben More	10.69	1443
5	East Peak A1AO	10.45	1475
6	East Shoulder	10.95	1582
7	Forest Hill 1	9.41	1067
8	Forest Hill 2	9.05	1025
9	Hall Road	10.25	1471
10	Heale Ridge	9.99	1411
11	Hedgehope Hill	10.43	1523
12	Kelvin Peak	10.72	1685
13	Mt Peel	10.15	1399
14	North Peak	10.75	1507
15	Pukemaire	10.8	1570
16	N Retreat Rd	10.1	1303
17	S Retreat Rd	11.05	1720
18	W Retreat Rd	10.65	1439
19	The Bastion	10.48	1506
20	Waimea Hill	10.22	1419



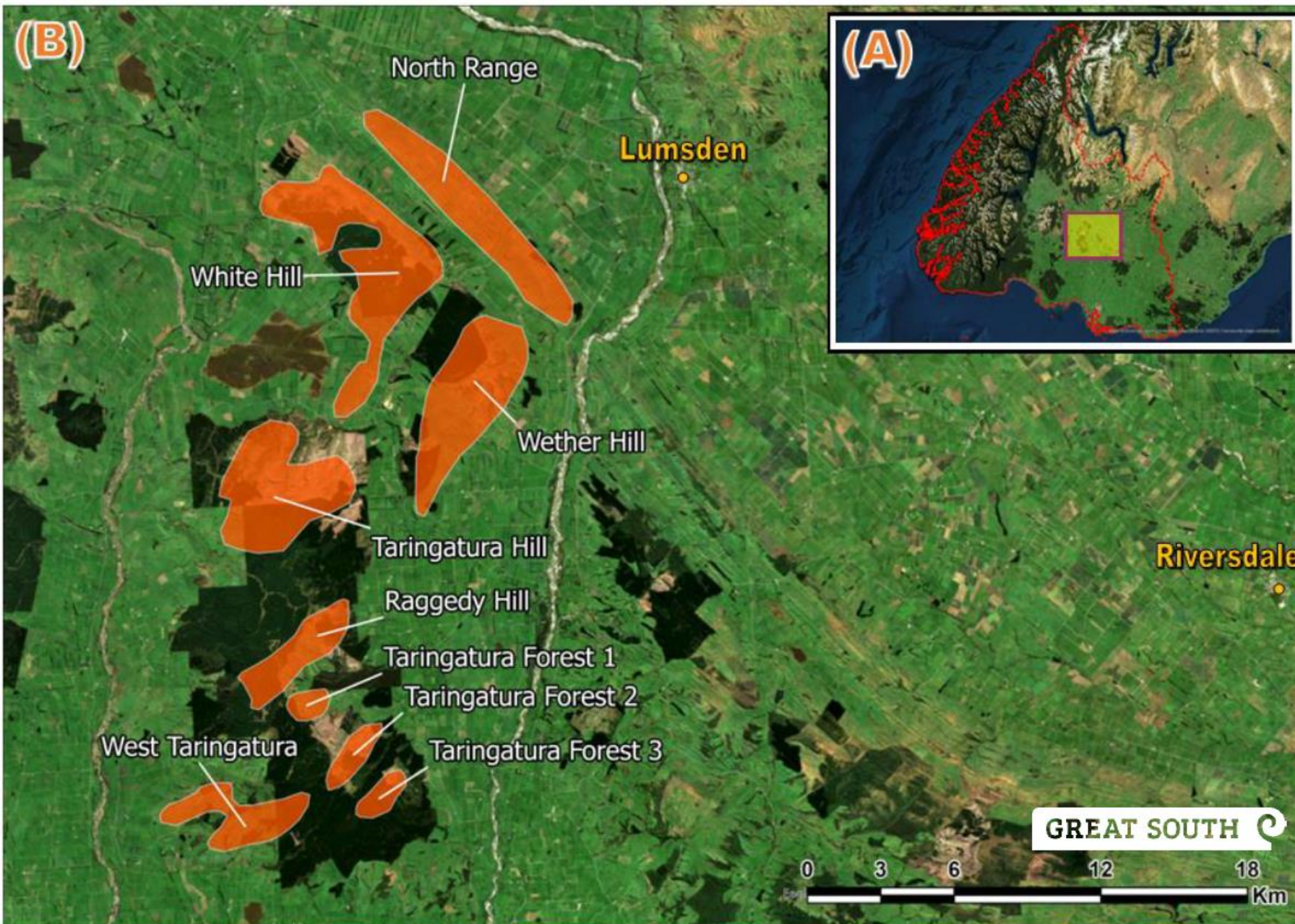
	Sub-region / Potential location name	Wind Speed (m/s)	Power density (W/m ²)
South of Southland			
1	Bald Hill	11.07	1563
2	Bluff	11.13	1549
3	Flat Hill 1	10.58	1347
4	Flat Hill 2	10.33	1240
5	Kawakaputa	10.73	1441
6	Longwood Range 1	11.57	1818
7	Longwood Range 2	11.66	1819
8	Omaui	10.55	1351
9	Pahia Hill	11.49	1879
10	Riverton	9.76	1156
11	Ruahine Hill 1	11.21	1630
12	Ruahine Hill 2	10.66	1398



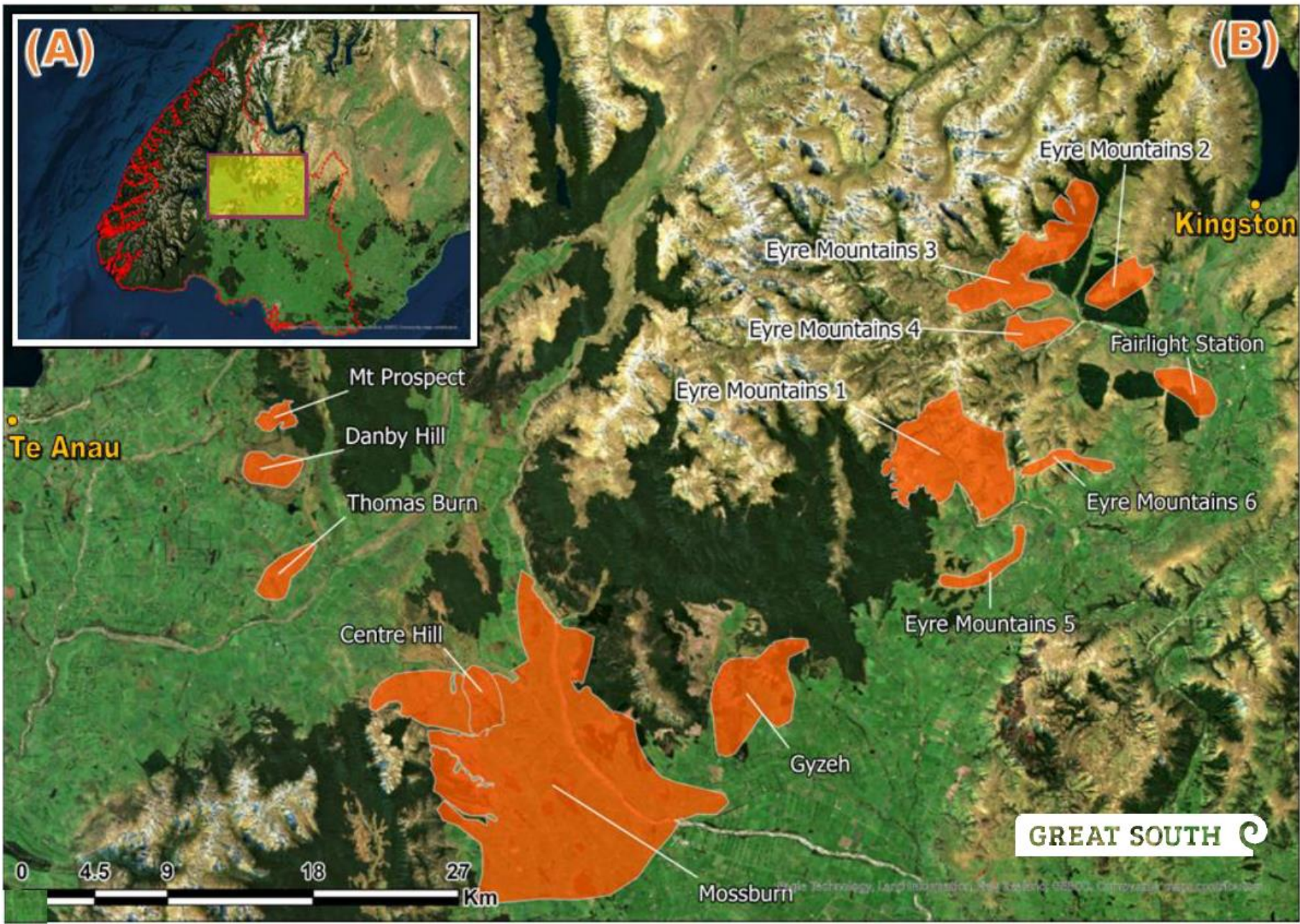
Sub-region / Potential location name		Wind Speed (m/s)	Power density (W/m ²)
South-East of Southland			
1	Brown Dome	10.49	1364
2	Hillary	10.46	1286
3	Hurst	10.29	1357
4	Kaihiku Range	10.19	1306
5	Kaiwera Downs	10.51	1296
6	Kuriwao	10.42	1429
7	Mokoreta	11.46	1773
8	SW Mokoreta	11.5	1694
9	Rocky Dome	10.83	1450
10	Waikaka Hill	9.51	1053
11	Wisp Range	10.31	1349



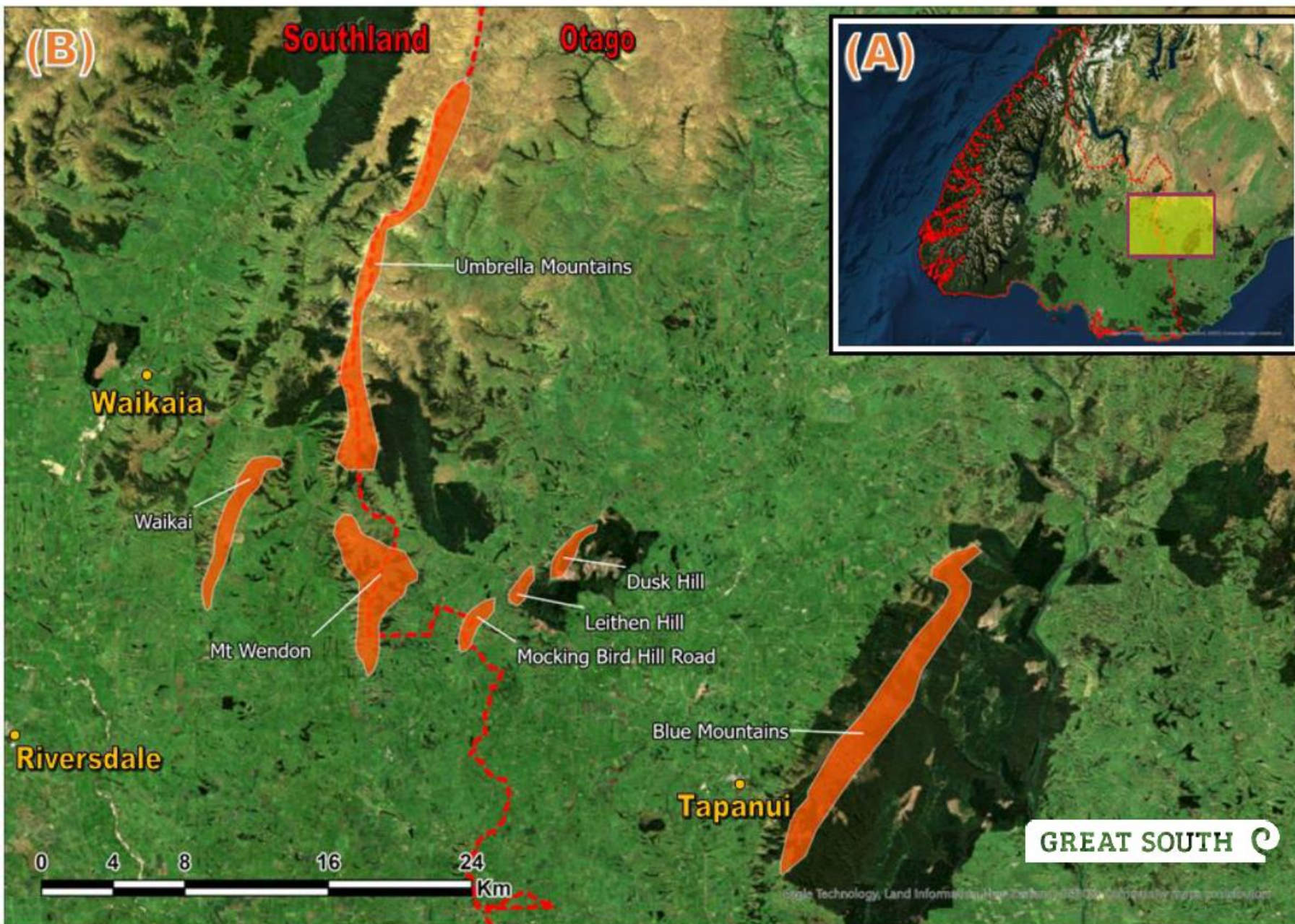
	Sub-region / Potential location name	Wind Speed (m/s)	Power density (W/m ²)
Takitimu Mountains			
1	Barcoo Bush	10.03	2043
2	Beaumont Hill	9.71	1699
3	Bell Mount	10.23	1966
4	NW Bell Mount	9.36	1421
5	Cessnock	11.03	2532
6	Etal Hill	9.8	1679
7	Gibraltar Hill	10.79	2385
8	N Grassy Creek	11	2206
9	S Grassy Creek	10.97	2388
10	Letham Hill	10.07	1795
11	Loudon Hill	10.79	2430
12	Mclvors Hill	10.25	1816
13	Montevue	9.99	1836
14	Morley Hill	10.03	1985
15	Mt Linton	9.87	1999
16	North Braxton	10.38	2016
17	Nugget Hill	9.88	1757
18	South Braxton	10.12	1956
19	NW The Knob	11.02	1975
20	W The Knob	11.11	2148



Sub-region / Potential location name		Wind Speed (m/s)	Power density (W/m ²)
Taringatura Hills			
1	North Range	9.76	1424
2	Raggedy Hill	10.06	1541
3	Taringatura Forest 1	9.77	1438
4	Taringatura Forest 2	9.59	1446
5	Taringatura Forest 3	9.8	1526
6	Taringatura Hill	9.87	1511
7	West Taringatura	9.66	1465
8	Wether Hill	10.23	1647
9	White Hill	10.34	1685

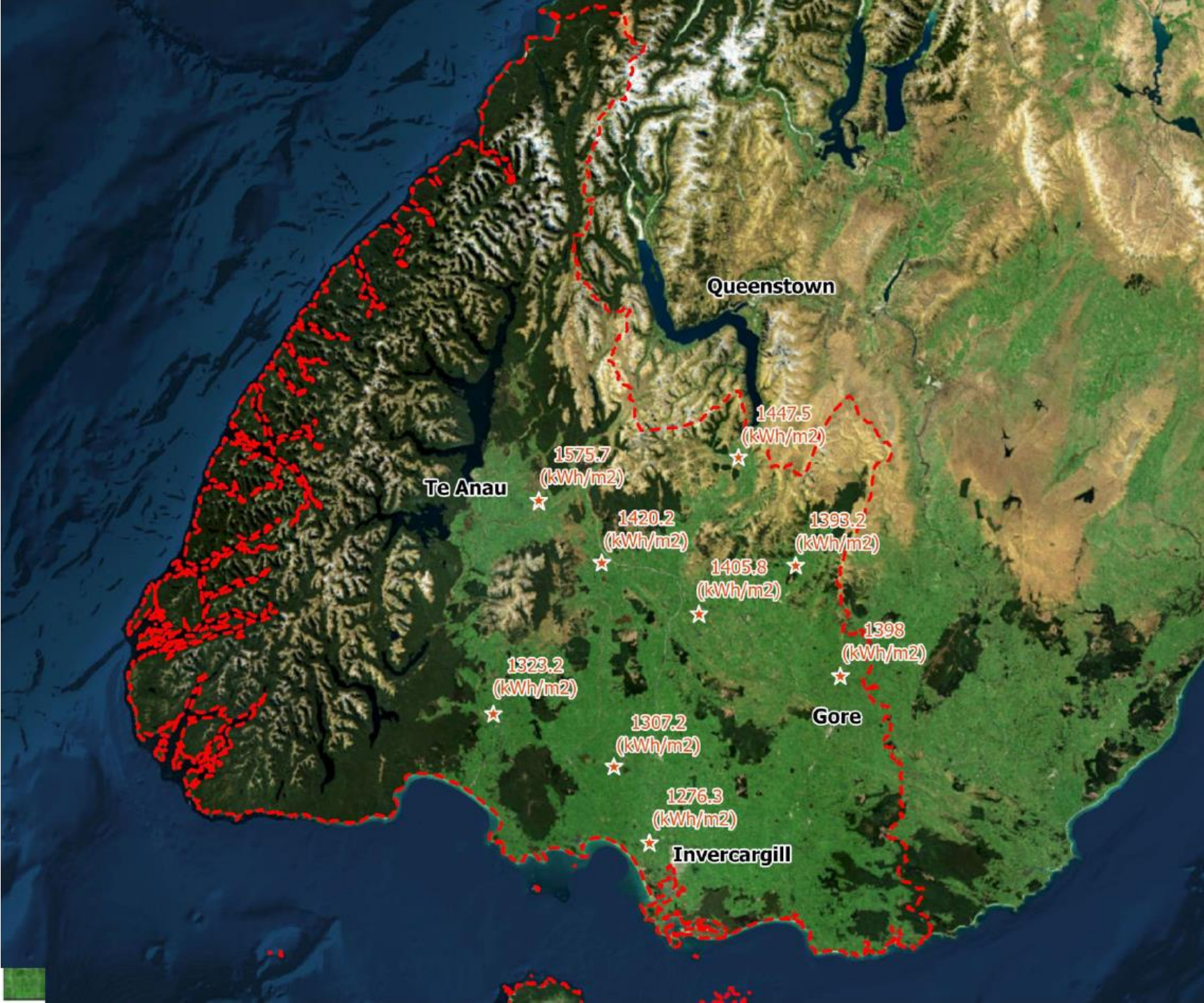


	Sub-region / Potential location name	Wind Speed (m/s)	Power density (W/m ²)
Te Anau – Lumsden and Eyre Mountains			
1	Centre Hill	11.81	2286
2	Danby Hill	10.39	1379
3	E Eyre Mountains 1	9	1820
4	E Eyre Mountains 2	9.13	2088
5	E Eyre Mountains 3	9.9	2393
6	E Eyre Mountains 4	8.14	1786
7	E Eyre Mountains 5	7.77	1240
8	E Eyre Mountains 6	9.4	1708
9	Fairlight Station	9.6	1507
10	Gyzeh	9.66	1863
11	Mossburn	10.22	1738
12	Mt Prospect	10.57	1474
13	Thomas Burn	9.57	1381



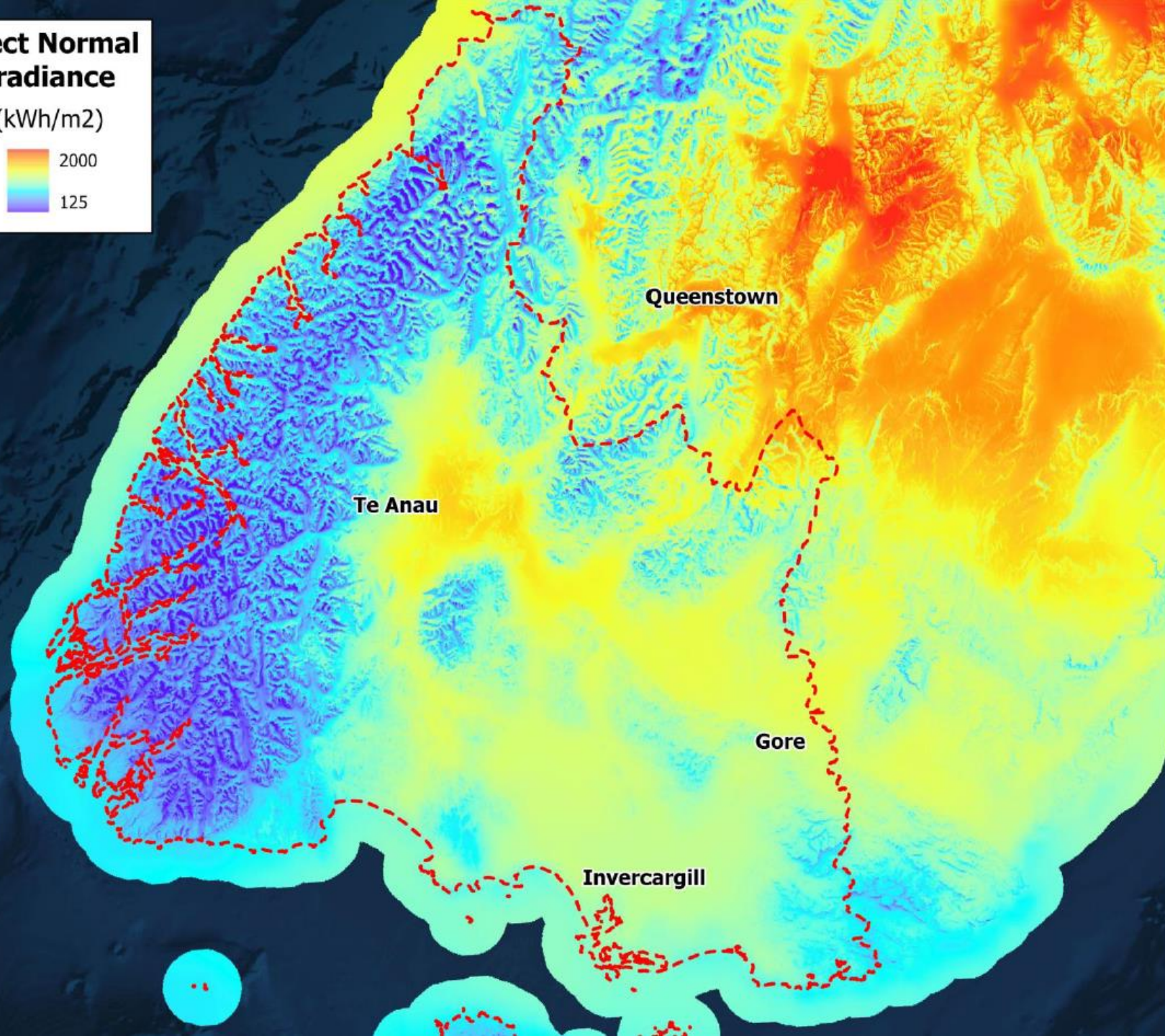
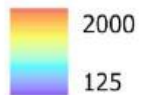
Sub-region / Potential location name		Wind Speed (m/s)	Power density (W/m ²)
Umbrella Mountains and Blue Mountains			
1	Blue Mountains	10.9	1704
2	Dusk Hill	9.57	1524
3	Leithen Hill	9.26	1451
4	Mocking Bird Hill Road	9.68	1544
5	Mt Wendon	9.78	1493
6	Umbrella Mountains	10.88	1998
7	Waikai	9.49	1432

Solar Options



Direct Normal Irradiance

(kWh/m²)



Solar Options

Direct Normal Irradiance from the
Global Solar Atlas
(<https://globalsolaratlas.info/map>)

Legend



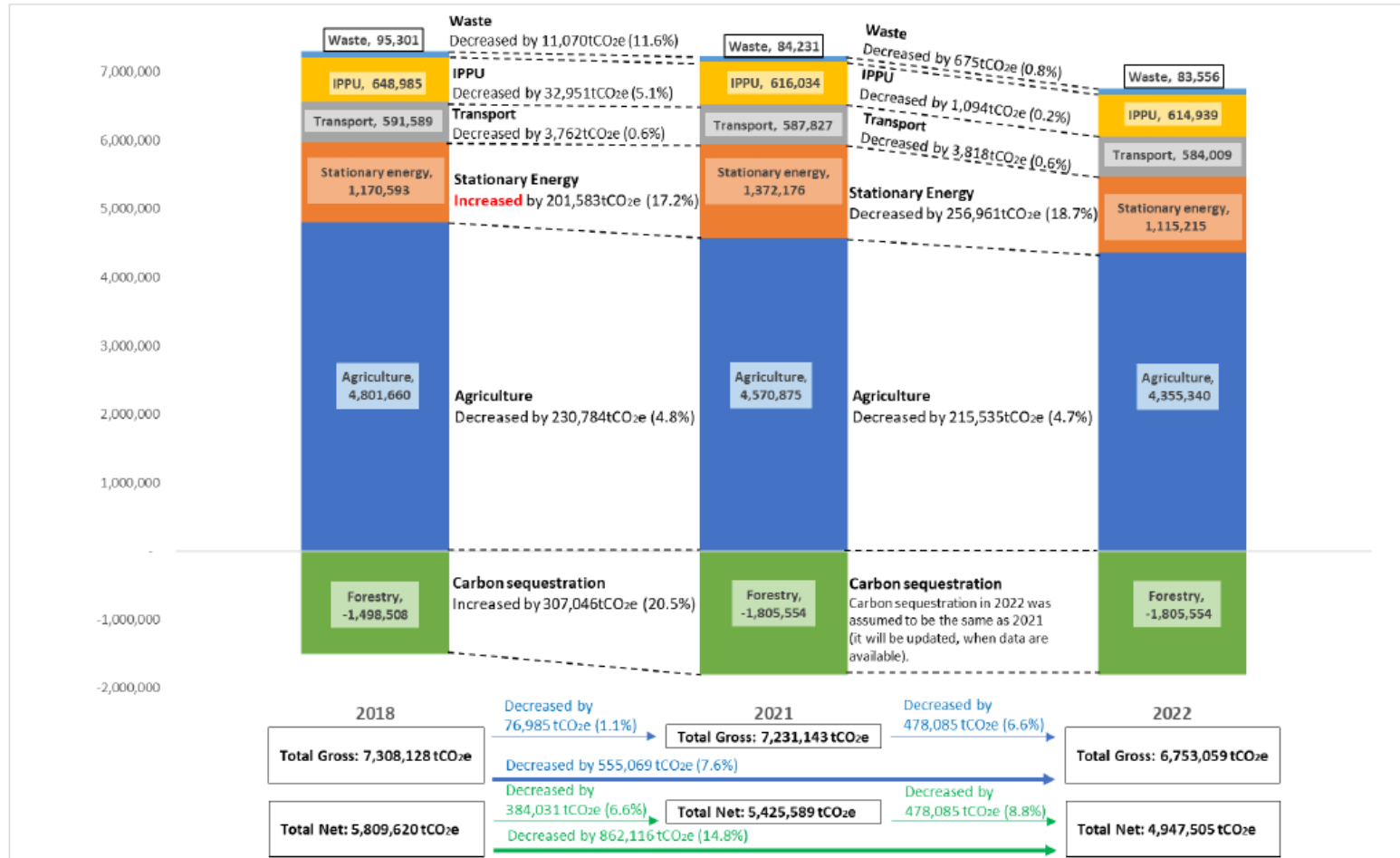
Offshore control points
(Wind speed m/s)

New Wind Generation Off-Shore



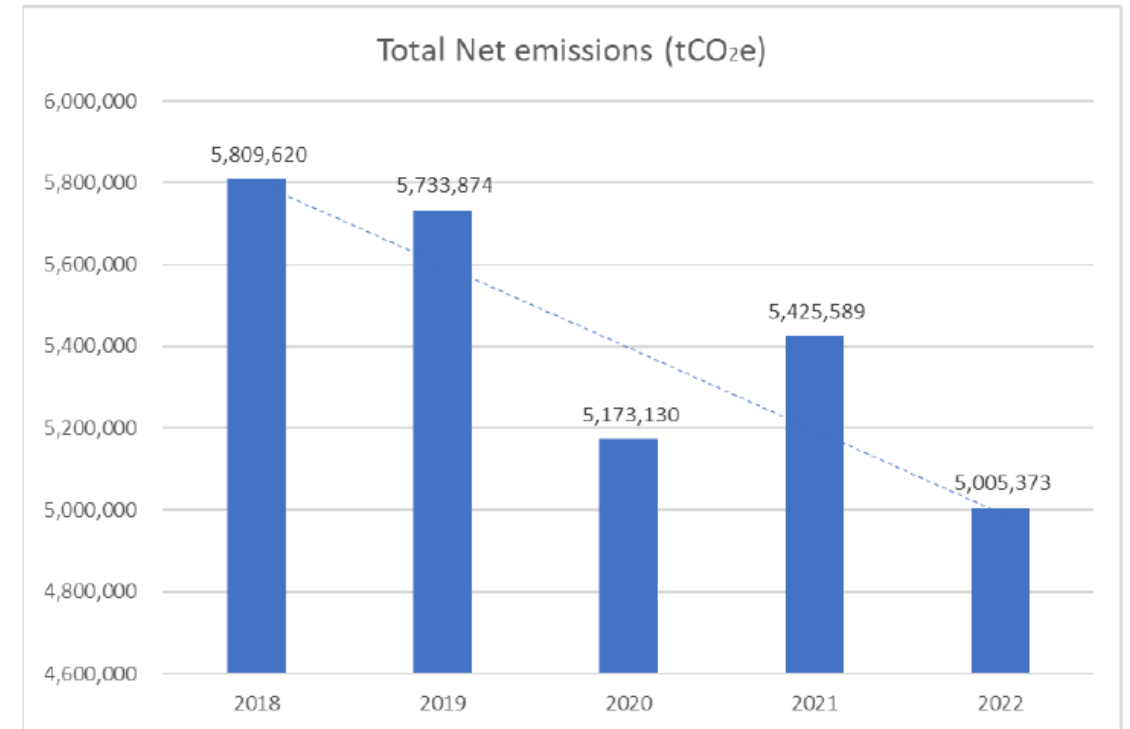
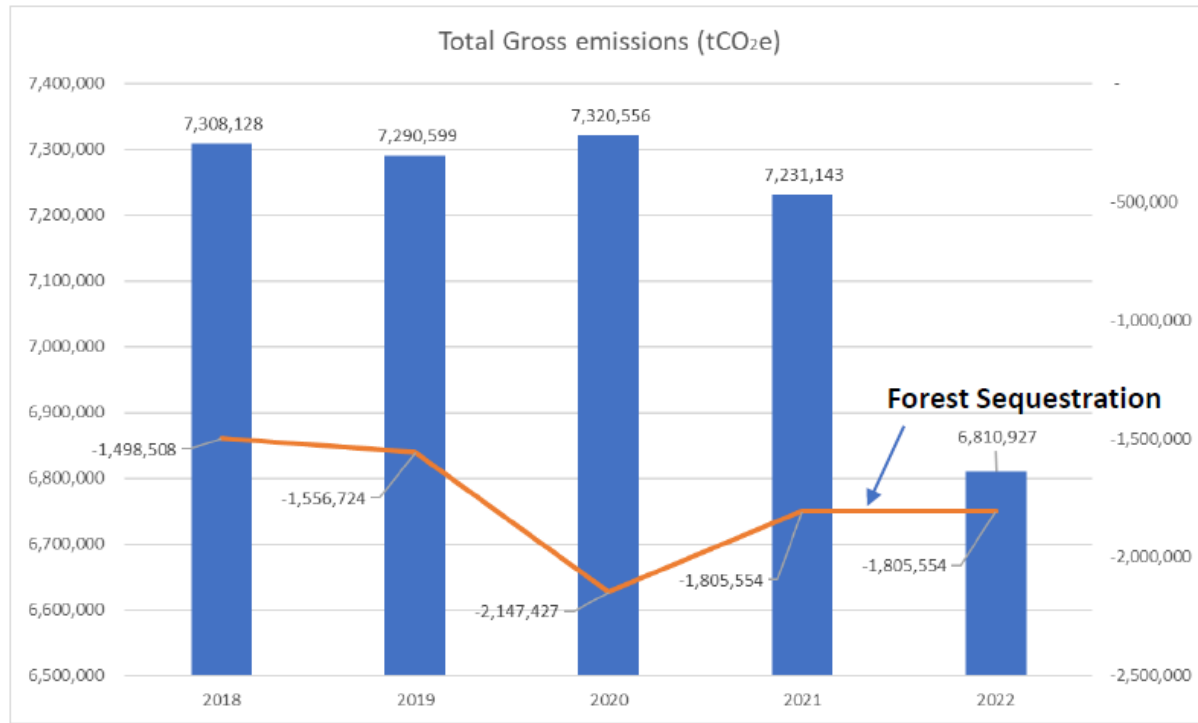
Net Zero Southland – 2050 Score Card

Southland's Regional Gross emissions -7.6% Net Emissions have dropped -14.8%



Southland Regional GHG emissions 2018, 2021 and 2022 prepared by Great South

Southland's Score Card on Emissions Reduction



What have we achieved to date?

- **To date we have had 51 wind investment enquiries & Transpower has advised that it has 2600Mw of new generation enquiries now at phase two of their evaluation process.**
- **98 boilers have been converted to date in Southland plus an additional 60 will be converted by 2026** resulting in 158 of Southlands 187 boilers on the pathway to conversion.
- **Regional emissions have reduced by 15%**
- **\$620m NPV** of avoided costs of carbon to date from the Southland economy driving competitiveness.
- **New Generation sites, and the provision of new infrastructure investment is being incorporated into regional spatial planning processes to reduce consenting delays & risks**



Questions?

For more information

Contact
Stephen Canny
steve@greatsouth.nz
021 516 347

Panel session:

Catalysing and connecting for success: The role of regional leadership and planning in sector development

- **Stacey Hitchcock - GM Investment and Deputy CEO, Venture Taranaki**
- **Rosie Spragg - GM Economic Development, Te Waka**
- **Anne Probert - Director Strategic and Sector Partnerships**
- **Steve Canny - Strategic Projects Group Manager, Great South & Chairperson, NZ Hydrogen Council (*online*)**

Lunch

The next session will begin at 2.00pm



Panel session:

Winds of change: What's next for offshore energy?

- **Jamie McNeill - Business Group Leader for Power and Future Energy for New Zealand and the Pacific, GHD (*Facilitator*)**
- **Nick Cozens - Chairperson, Offshore Wind Working Group + Technical Director – Infrastructure & Renewable Energy, BECA**
- **Anna Crameri - Offshore Wind Leader, ANZ, RPS**
- **Jonathan Young - Head of Industry and Government Engagement, Ara Ake**

2024 Offshore Renewable Energy Forum

20 – 21 March 2023 | TSB Hub, Hāwera

