



Our Global Footprint



London Array—630MW Offshore Wind

Elemental's New Energy Director Andrew Revfeim was Masdar's Head of Commercial in 2009 as they agreed on valuation and financing for their 20% stake in the project

175-turbine project 630 MW off the UK's Kent coast.

UAE-Pacific Renewable Energy Programme

Project and Engineering Management for sites in 8 Pacific Nations (Fiji, Tuvalu, Kiribati, RMI, FSM, Palau, Nauru, Samoa)

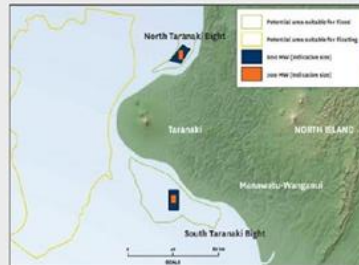
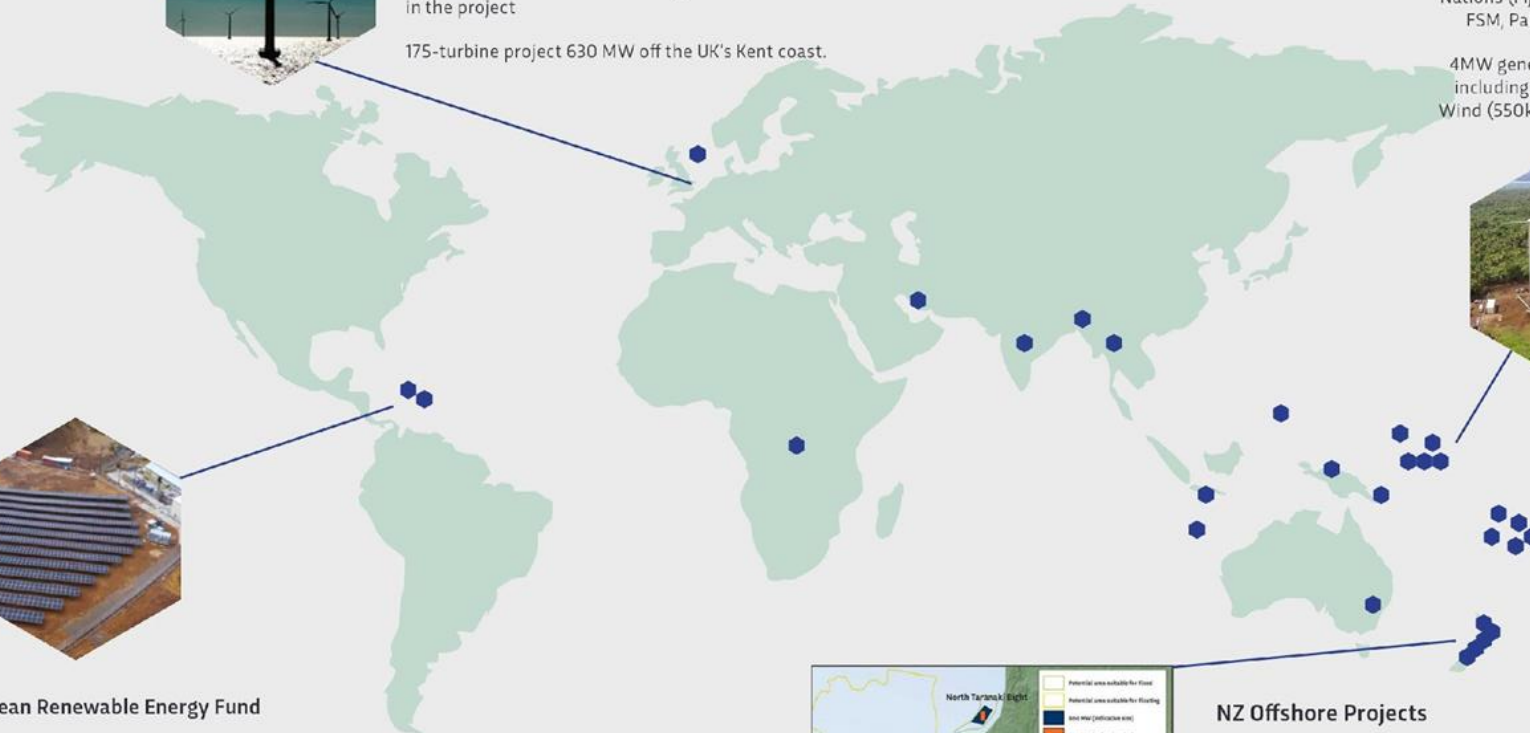
4MW generation implemented including Solar-PV, Diesel and Wind (550kW Onshore in Samoa)



UAE-Caribbean Renewable Energy Fund

Project and Engineering Management for sites in 12 Nations (St Vincent, Barbuda, St Lucia, Grenada, Suriname, Guyana, Haiti, St Kitts & Nevis, Dominica, Dominical Republic, Jamaica, Trinidad & Tobago)

10MW generation and 12MWh battery storage underway.



NZ Offshore Projects

Development & asset management, operational support, engineering & environmental monitoring/advisory for offshore projects in the Taranaki & greater New Zealand region including Maari, Tui, Kaheru, Maui, & Pohokura.

Completed offshore wind opportunity assessment paper for Venture Taranaki.

New Zealand

- Energy Transition Accelerator (EECA)
- Wind
- Solar
- O&G Transitions
- Energy Management

Our key people

Nick Jackson



- Marine operations
- Project management
- O&G transitions
- Geology
- Geothermal
- Energy Resources Aotearoa (Board)

Brett Rogers



- Commercial lead
- Renewables
- O&G
- Project development
- Energy Transition Accelerator (EECA)

Andrew Revfeim



- Financial modelling
- Global energy projects
- London Offshore Array
- MASDAR
- Hydrogen
- Solar Thermal

Kate Bromfield



- Environmental management
- Sustainability
- Marine geology & ecology
- Ex EPA

Trevor Nash



- Onshore wind development & technology
- Energy management
- Decarbonisation / EECA ETA

Will Thorp

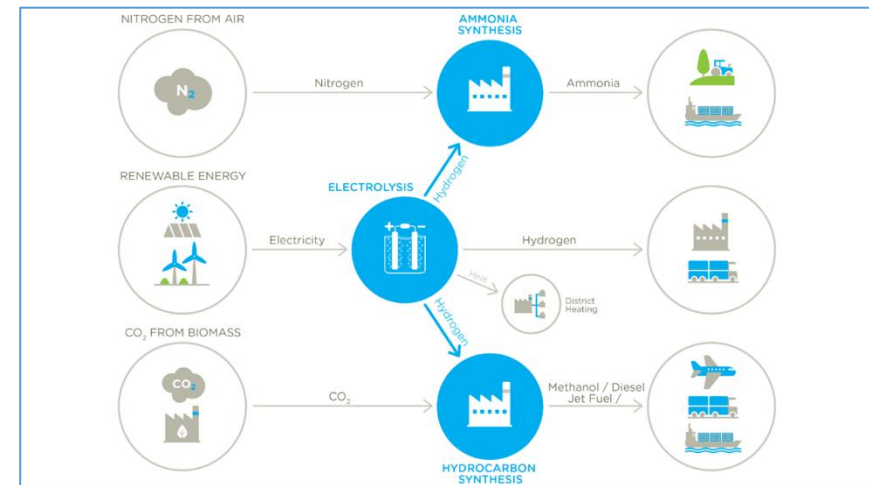


- Technical lead
- Global consulting
- Wind specialist
- Ex DNV, GL, GH




New Zealand Offshore Wind

- Established as a vehicle for growing capability, relationships, know-how and track record in the New Zealand offshore wind industry
- We're actively partnering with people, entities and stakeholders that are motivated and capable of driving forward a fundamentally new large-scale energy business in NZ.

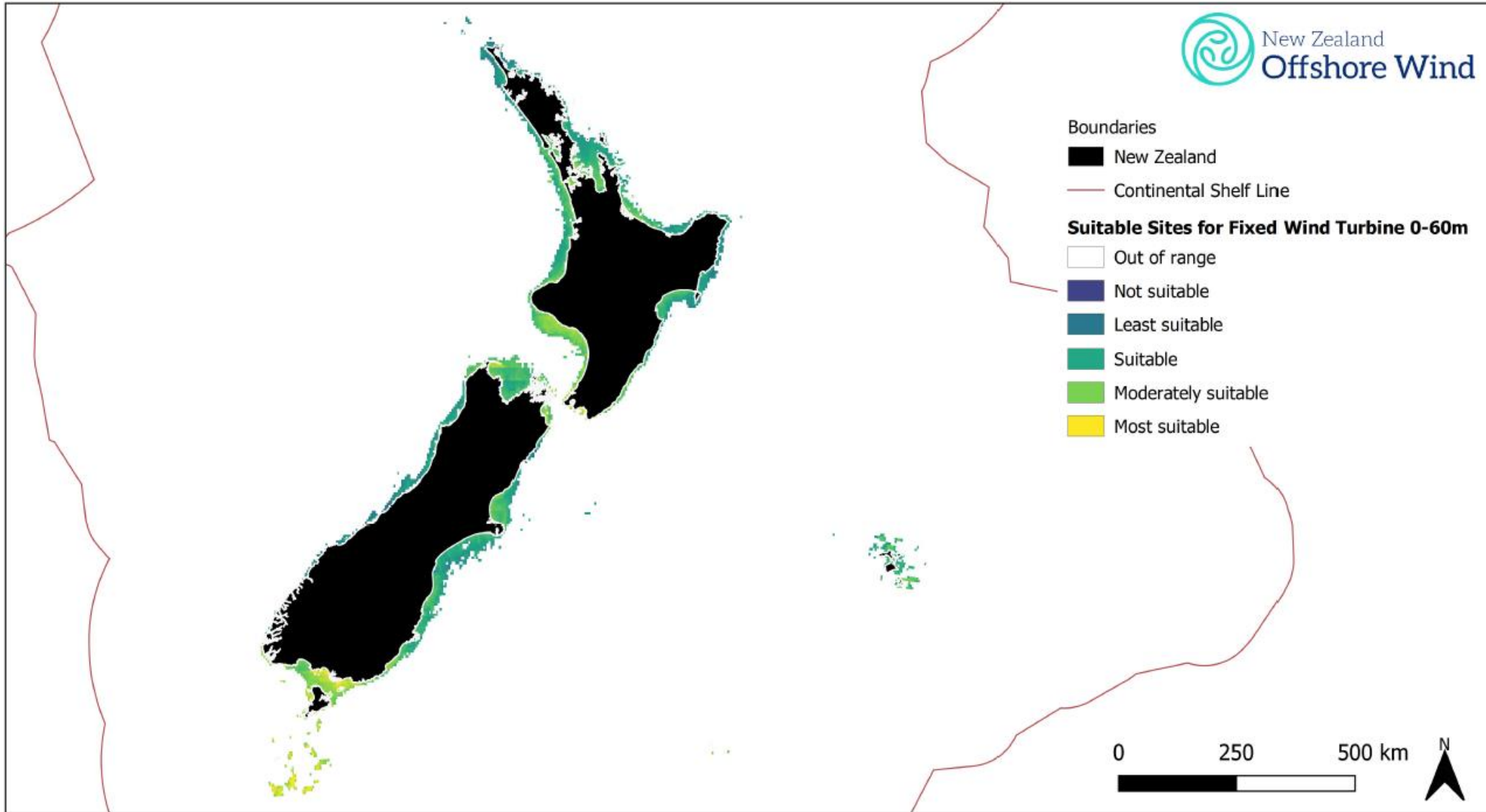


Boundaries

-  New Zealand
-  Continental Shelf Line

Suitable Sites for Fixed Wind Turbine 0-60m

-  Out of range
-  Not suitable
-  Least suitable
-  Suitable
-  Moderately suitable
-  Most suitable



Boundaries

■ New Zealand

— Continental Shelf Line

Suitable Sites for Floating Wind Turbine 60-200m

□ Out of range

■ Not suitable

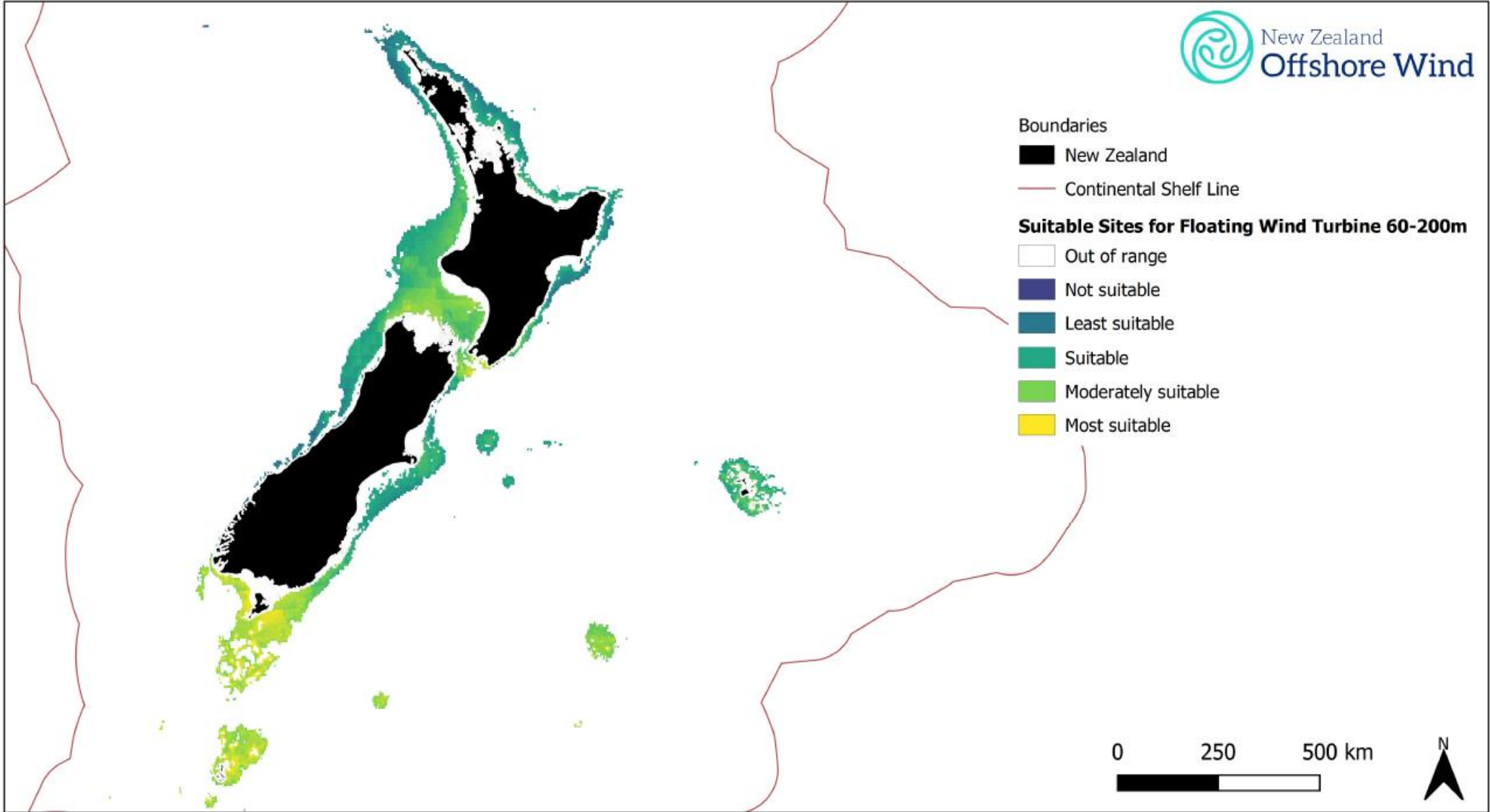
■ Least suitable

■ Suitable

■ Moderately suitable

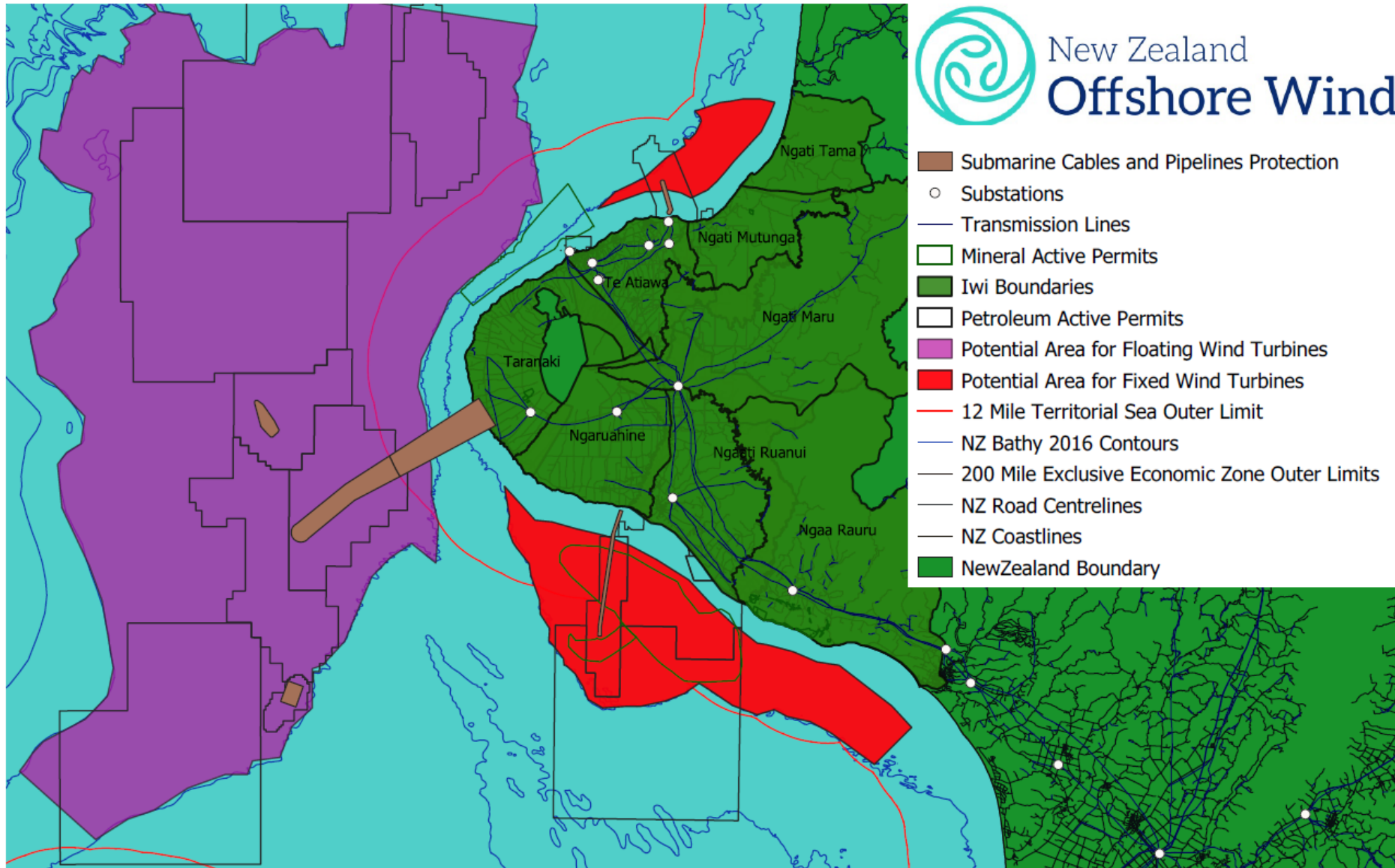
■ Most suitable

0 250 500 km



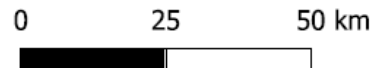


New Zealand Offshore Wind




Offshore Wind Zones of Interest and Stakeholder Map

Date: 20/08/2020
 Author: H Perry
 © 2020




Boundaries

 New Zealand

 Continental Shelf Line

Suitable Sites for Floating Wind Turbine 200-1000m

 Out of range

 Not suitable

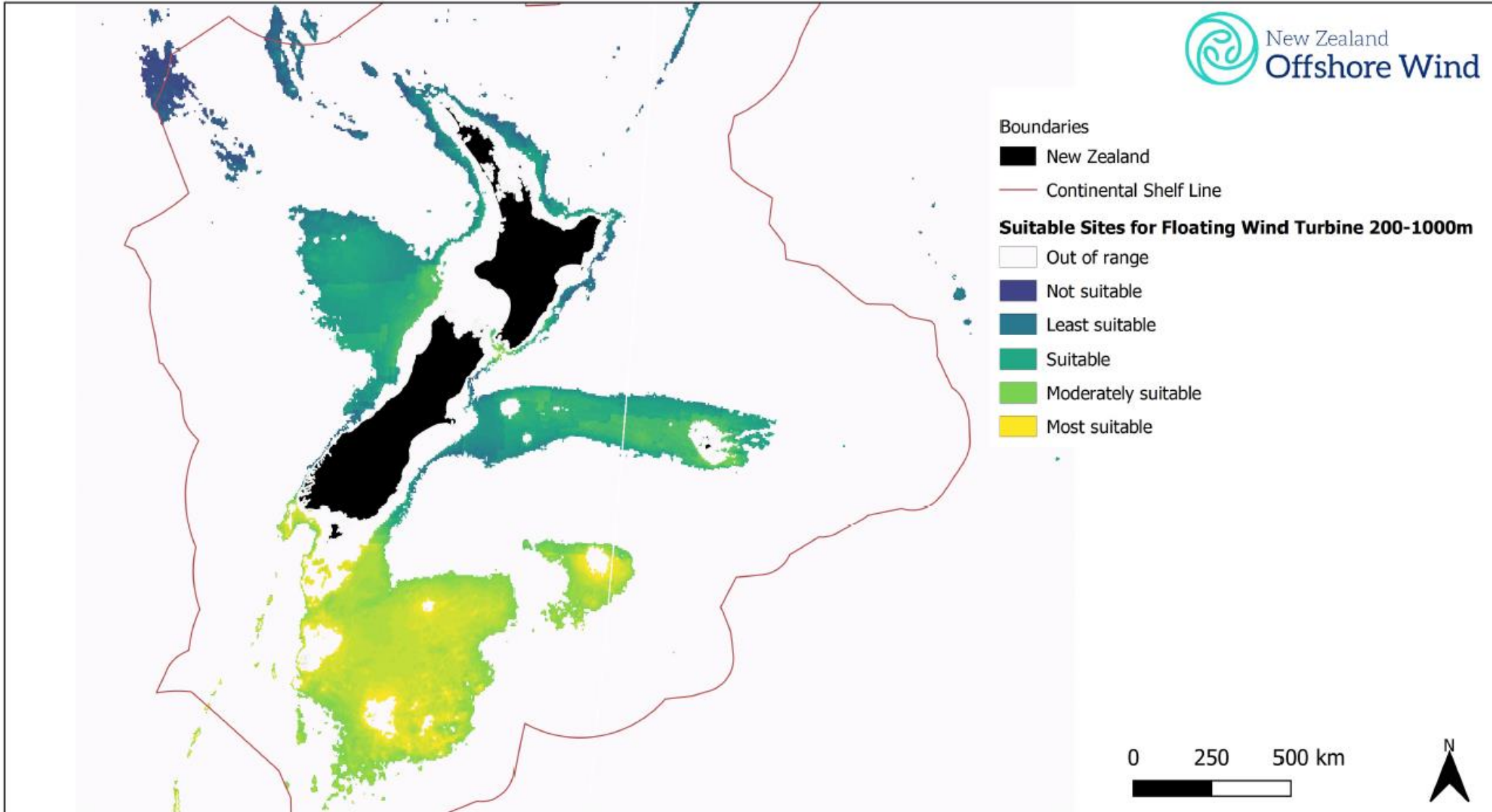
 Least suitable

 Suitable

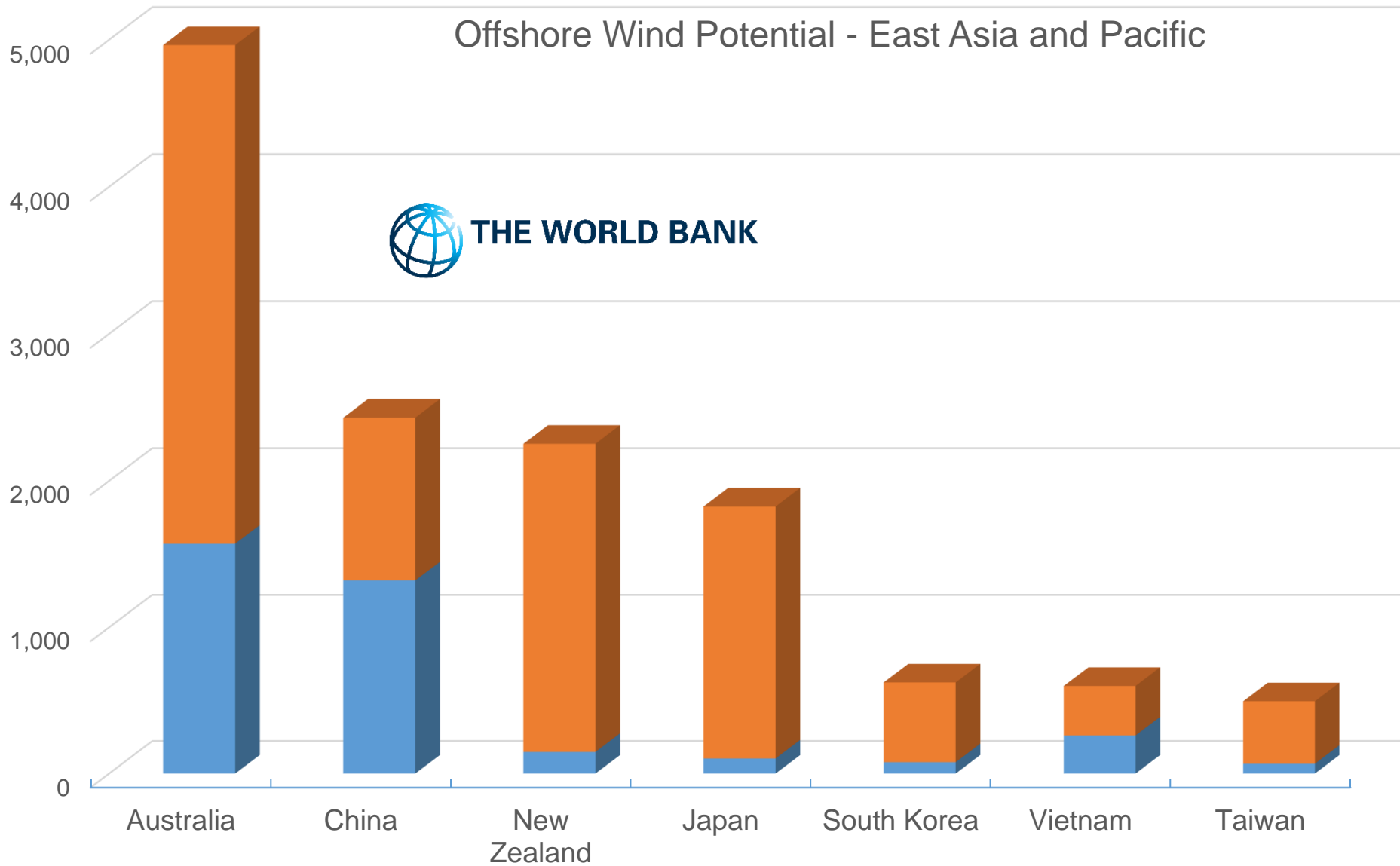
 Moderately suitable

 Most suitable

0 250 500 km



Offshore Wind Potential - East Asia and Pacific



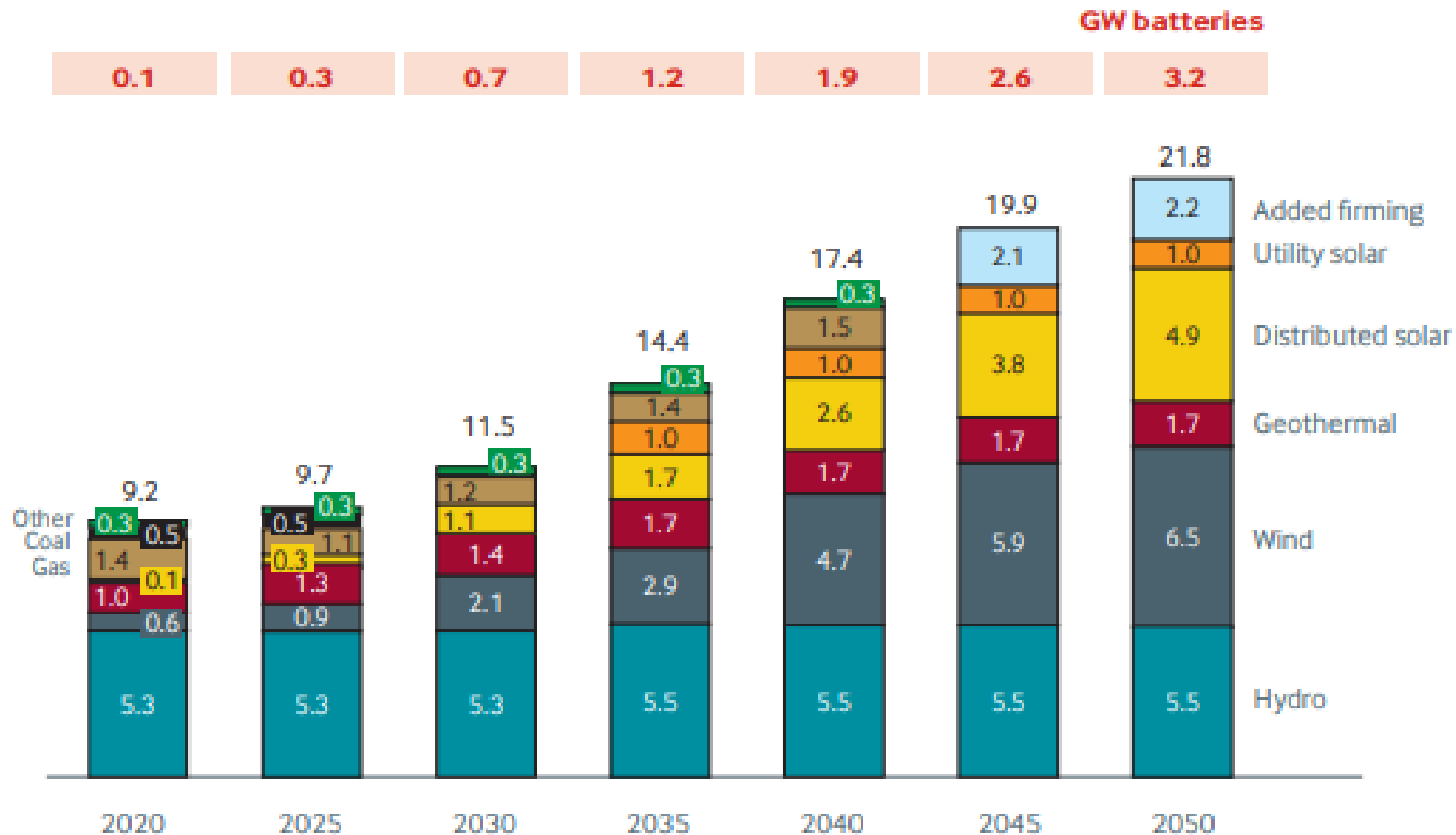
■ Potential Fixed Foundations [GW]

■ Potential Floating Foundations [GW]

Transpower 03/2020: 6.5GW of wind by 2050

Figure 10: Generation capacity by type

(GW, Accelerated Electrification)



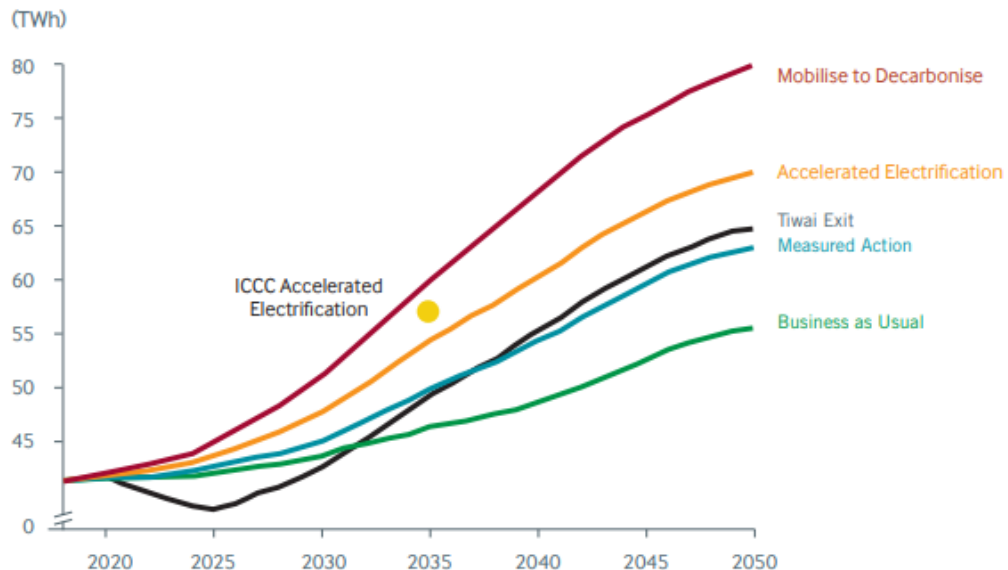
Technically feasible with onshore wind

2021: More rapid decarbonisation – needs more wind

Whakamana i Te Mauri Hiko is clear on its Accelerated Electrification base case scenario as the most likely outcome for New Zealand's energy future.



Figure 13: Electricity demand assumptions for each scenario



- 20% Hydrogen blend by 2035
- 100% Hydrogen by 2050

“Gerritsen said the amount of electricity generated in New Zealand would need to nearly triple from 42 terawatt-hours a year to 114TWh/year by 2050 to provide the power to convert water into hydrogen while also meeting the expected increase in electricity demand that will otherwise occur by then. The vast majority of that expected extra power would come from wind and solar power, First Gas believes.”

<https://www.stuff.co.nz/business/124668825/gas-appliances-would-need-to-be-replaced-from-2035-under-first-gas-hydrogen-plan>

HTHP

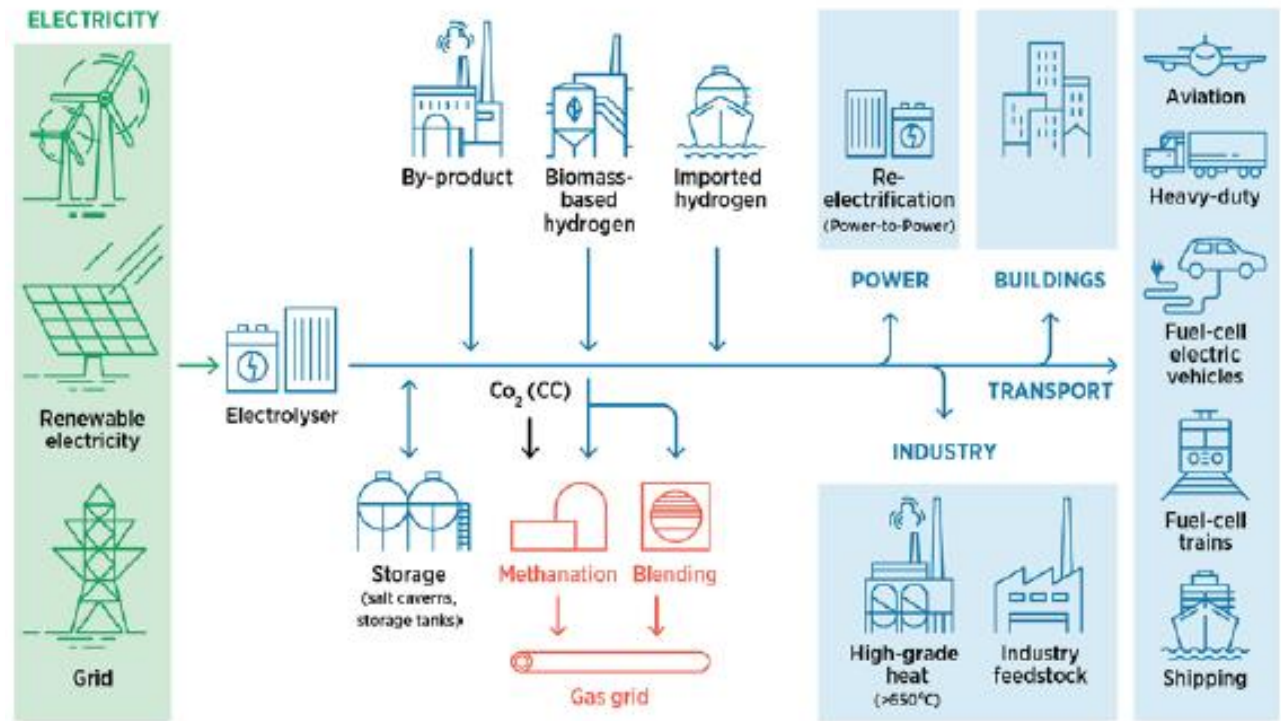
Electric cars 'will be cheaper to produce than fossil fuel vehicles by 2027'

BloombergNEF forecasts result of falling cost of making batteries as well as dedicated production lines



Power to X, and export – even more renewables needed

Power-to-X : Integration of renewable energy into end-uses



Source: IRENA, 2018d.



POTENTIAL INTEGRATION OF HYDROGEN INFRASTRUCTURE

THE MAP SHOWS HOW FUTURE HYDROGEN AND RENEWABLE ELECTRICITY DEVELOPMENTS WOULD INTEGRATE WITH TARARAKI'S EXISTING ENERGY INFRASTRUCTURE.



Te Haumoana.

New Zealand can grow large green-energy businesses....

....offshore wind is the natural energy source for those businesses.

Can Offshore Wind be cheap enough?

Saudi Arabia wind farm claims world record low energy cost

Joshua S Hill 13 August 2019 0 Comments

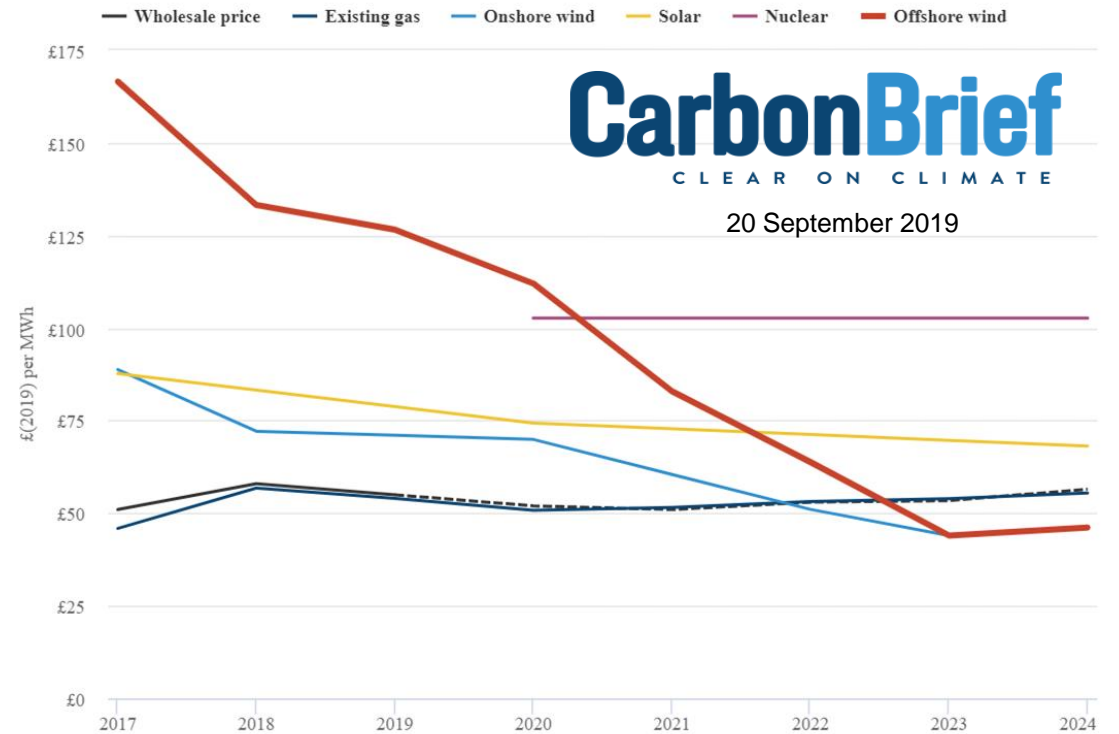
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Saudi Arabia's 400MW Dumat Al Jandal onshore wind farm has announced what it says is a world record-low onshore wind levelised cost of electricity (LCOE) of **1.99 US cents** per kilowatt-hour (kWh).

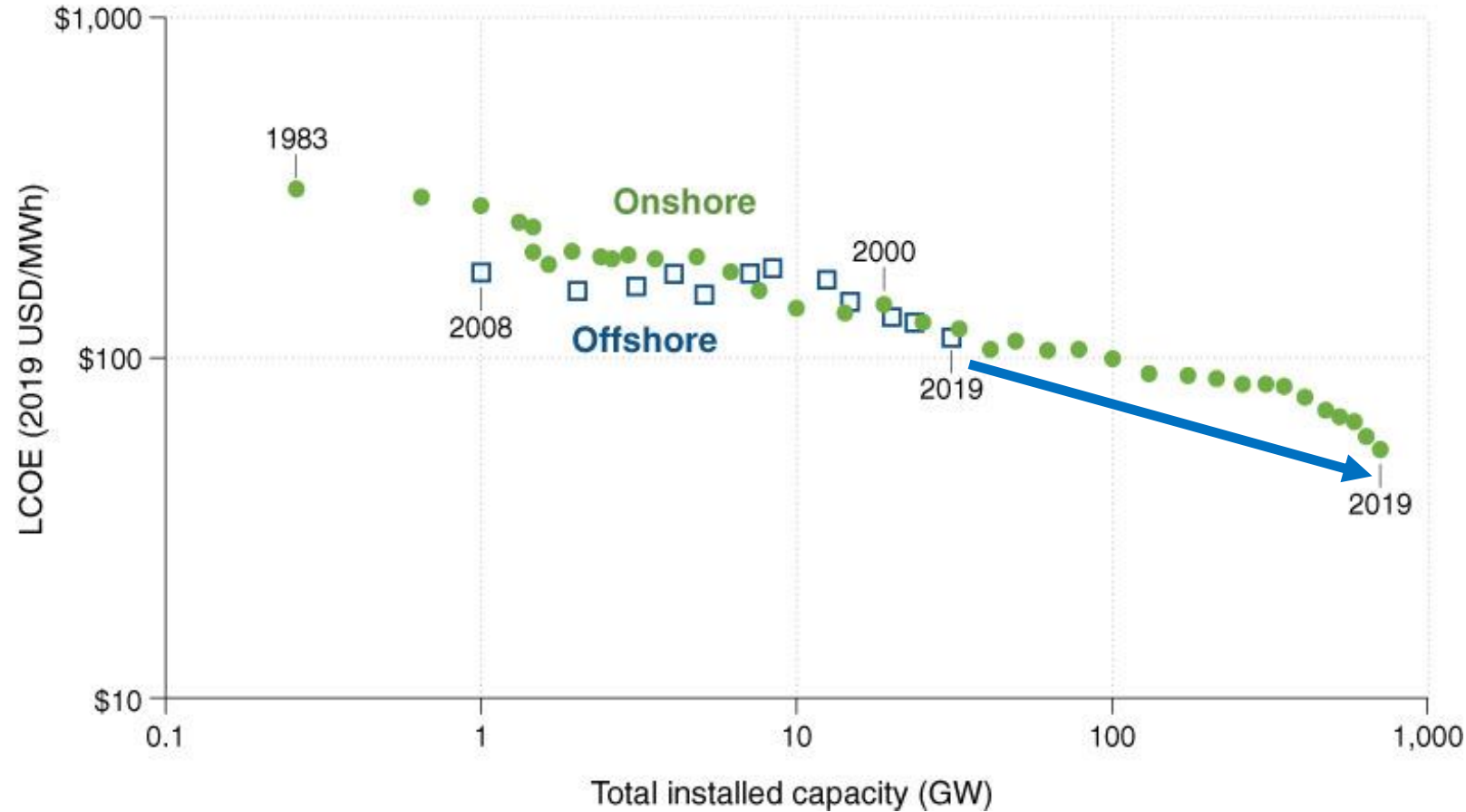
Record-low UK **offshore wind prices** could be cheaper than **existing gas plants** by 2023

Prices for onshore wind and solar could be even lower but they cannot compete for contracts



Third round UK program awarded 5.5 GW, with prices bottoming out at £39.65/MWh. Projects to be delivered by 2024-25.

Offshore Wind is following the same price path...



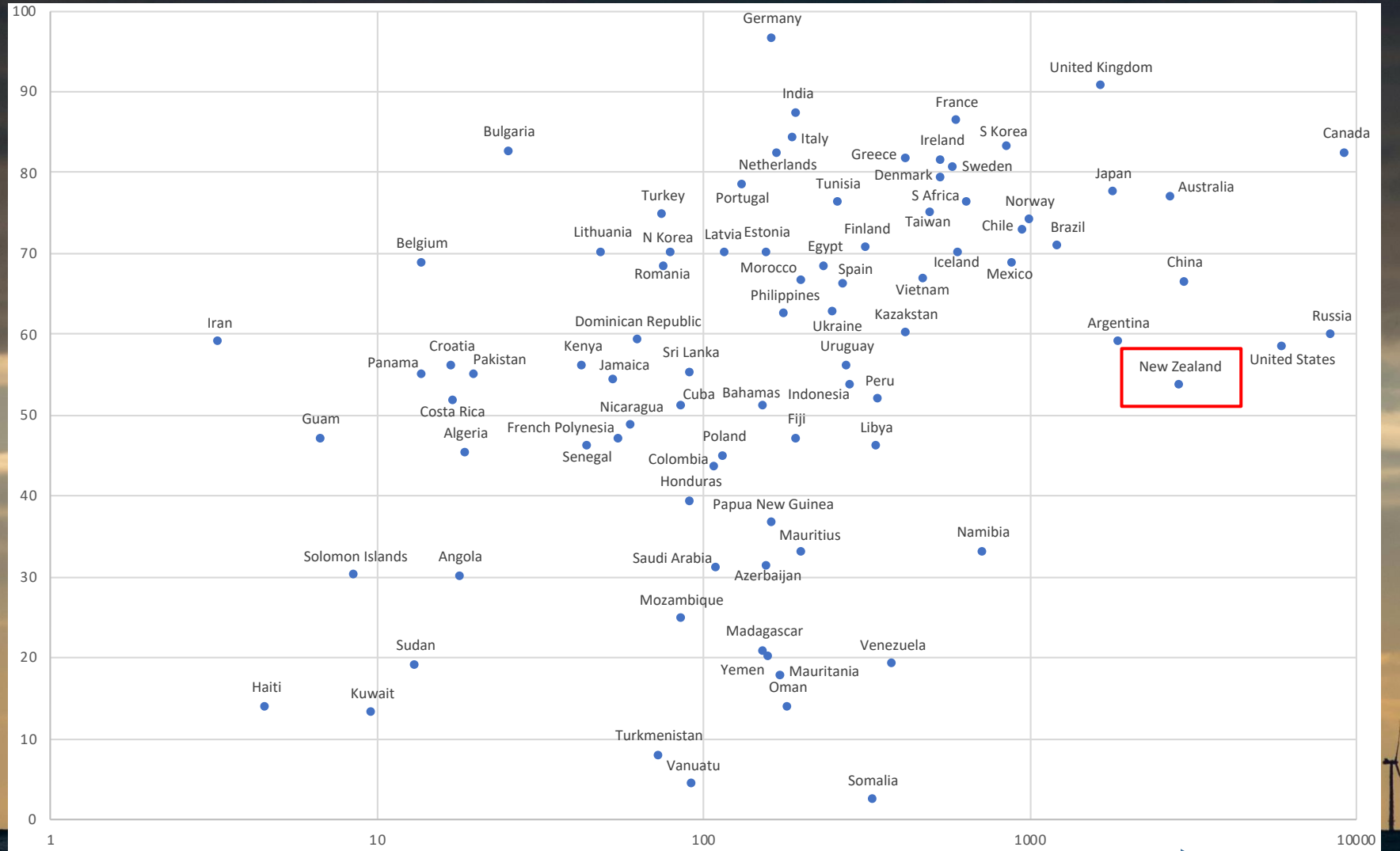
Offshore Wind predicted compound annual growth rate (CAGR): 13.5% (2019 to 2026)

Source: Globe NewsWire



NZ potential in global context

Policies and regulations favouring renewables



Offshore Wind Technical Potential (GW)

Next Steps – Enablement

- Seabed leases – consider the UK Crown Estate model
- Resource permitting and know how – are we ready?
- Technical groundwork by CRIs and Universities

Thank you!

5km

8km

16km

24km

32km 40km