Day 1 – Wednesday 20 March

venture TARANAKI
Te Puna Umanga

Ara Ake
Future Energy Development

2024 Offshore Renewable Energy Forum

20 – 21 March 2023 | TSB Hub, Hāwera

PARK WIND JERA GROUP

Elemental Group

BlueFloat ENERGY

Oceanex

TARANAKI OFFSHORE PARTNERSHIP

new zealand wind energy association

NIWA Taihoro Nukurangi

GHD

Sumitomo Corporation


venture
TARANAKI
Te Puna Umanga
Ara
Ake
Future
Energy
Development
Erico Lima
Global Offshore Wind Leader, EY

Foundations of a new offshore wind market

Offshore Renewable Energy Forum

20 March 2024

Presented by

Erico Lima

EY Global Offshore Wind Leader

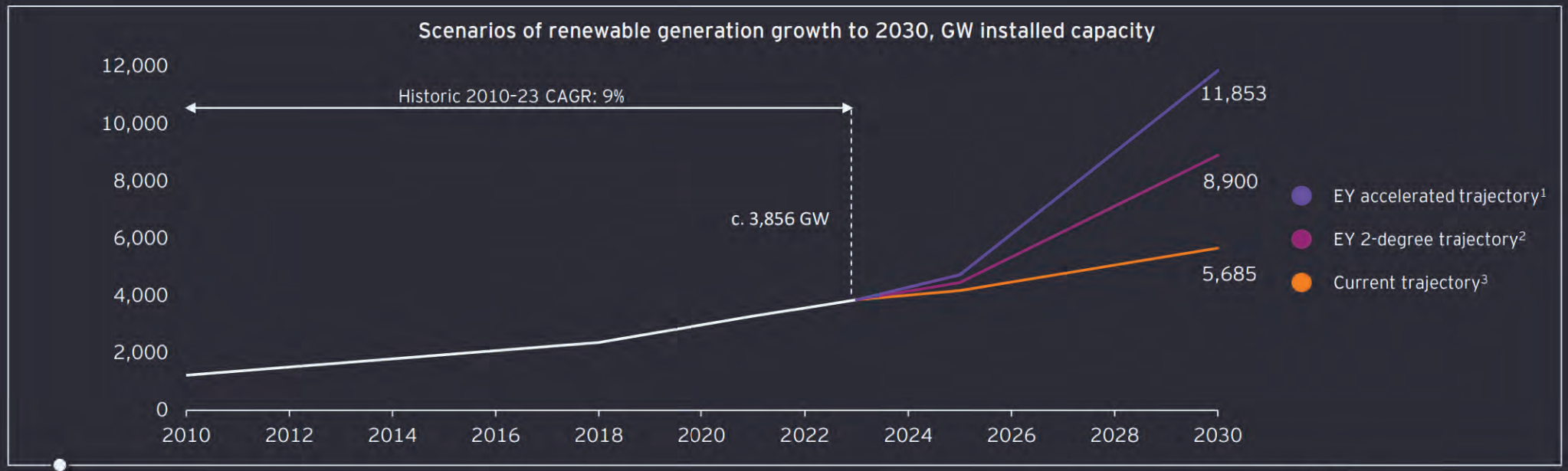
EY

Building a better working world

Disclaimer

- This material has been prepared for general informational and educational purposes only and is not intended, and should not be relied upon, as accounting, tax, legal or other professional advice. Please refer to your advisors for specific advice.
- Neither the EY organization nor any of its member firm thereof shall bear any responsibility whatsoever for the content, accuracy, or security of any third-party websites that are either linked (by way of hyperlink or otherwise) or referred to in this presentation.
- The views of third parties set out in this webcast are not necessarily the views of the global EY organization or its member firms. Moreover, they should be seen in the context of the time they were made.

Unprecedented growth in renewables installed capacity is needed to deliver net-zero aspirations



From **3.9 TW** currently in operation, renewable capacity is expected to grow to **12.2 TW by 2030**, requiring ca. **US$2.4tn of capex** to be invested per year in order to achieve such a challenging objective.

Source: EY Energy and Resources Transition Acceleration model as of 11 March 2024.
Notes: 1. Industry and government collaborate to beat the agreed target and commit to make significant changes that prioritize sustainability, limiting global warming to 1.5 degrees by 2050 >2 degrees by 2050; 2. Industry and government work together to deliver technology-enabled products and services needed to meet agreed goal, keeping warming to 2 degrees by 2050; 3. Industry unwillingness to change, political expediency and slow technology progress, with global temperatures rising

Renewable capacity expected to double by 2030, with offshore wind as the fastest-growing technology

Source: EY Energy and Resources Transition Acceleration model as of 11 March 2024.

Limited supply: cost increases and supply chain bottlenecks

Limited manufacturing capacity

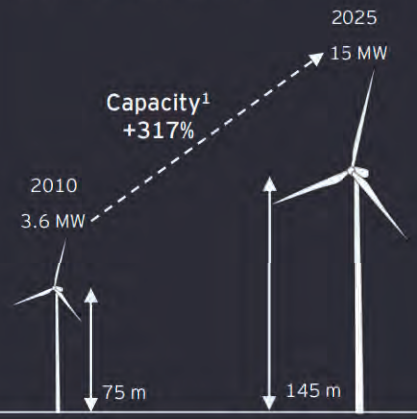
- Annual output of manufacturing plants needs to triple to reach 2030 targets.
- Industrial policies are only just now being put in place to boost manufacturing capacity.

Actual: 2023 11 GW

Needed: 35 GW to 2030

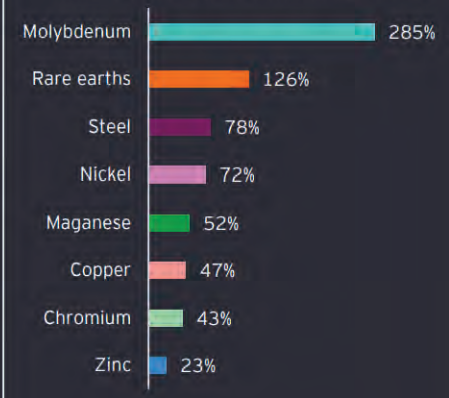
Lack of capable vessels

- Increase in turbine size poses challenges to current fleet of jack-up vessels and heavy lifts, while increasing demand for new, bigger vessels.
- The largest jack-up vessel in operation (commissioned in 2022) is already facing challenges with the size of wind turbines in the pipeline.



Key raw materials price change

Commodity price increases from January 2020 to March 2023



- On average a combined c.15.4 tons/MW is used in the production of offshore wind turbines.

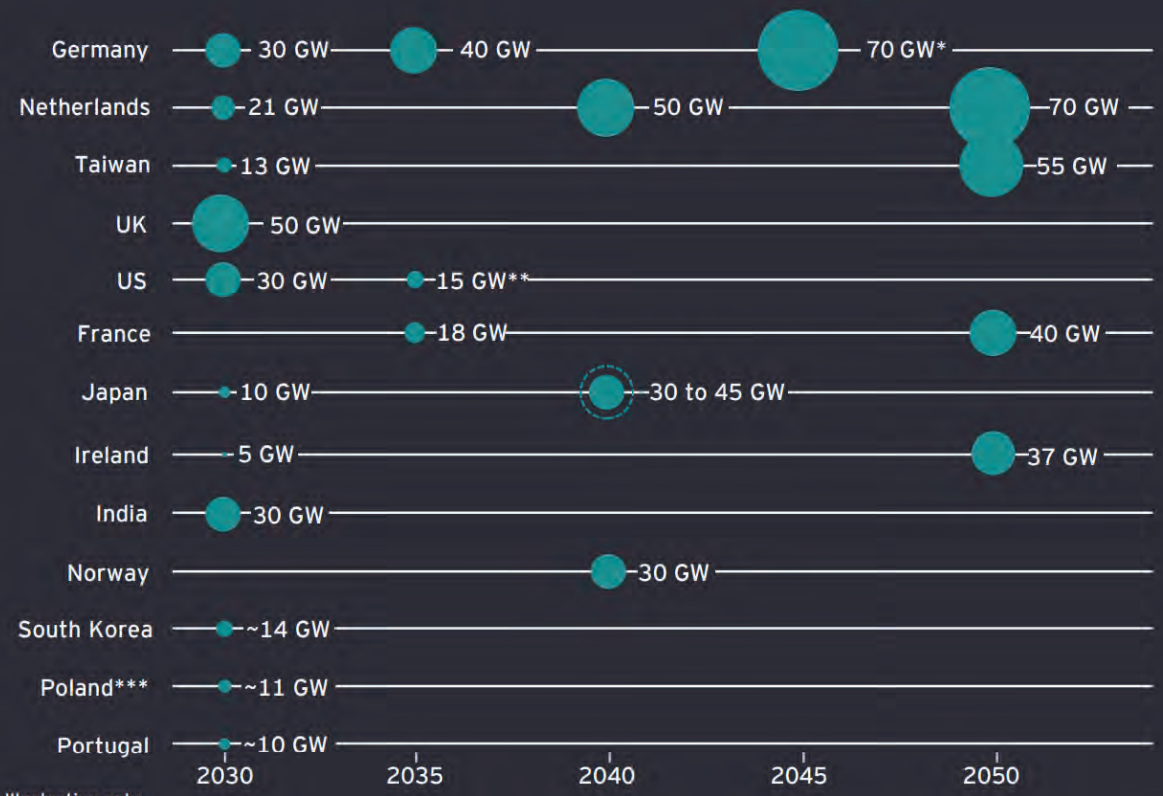
Turbine price trends

Indexed average turbine price per MW
2019 = 100

- Turbine prices (per MW) have been reducing during the last decade with improved overall efficiency and increasing turbine capacity.
- The trifecta of supply chain bottlenecks, inflation and interest rates has reversed this trend over the last three years.

Sources: EY analysis of data from Global Wind Energy Council, IMF and IEA, CapitalIQ, EY RECAI. Note: 1. From SWT-3.6-107 to V236 15MW.

Endless demand: 2030 targets have grown markedly over the past years



- It is forecast that c. **80% of the 2030 OFW targets will be missed.**
- And yet 2030 government targets have **continued to increase.**
- This relentless demand has been a major contributor to the high capex inflation in the sector, but **how much more are consumers willing to pay?**
- If supply chains are built out to satisfy peak installation demand in 2030 (somewhere close to government targets), there **may be insufficient demand after 2030 to support this capacity.**
- **Governments are only just now focusing on industrial policies to support** faster supply chain development, including infrastructure, skilled labor and technology.

Illustrative only.

* Greater than or equal to 70 GW.

** Floating offshore wind target.

*** Poland has set a target of 10.9 GW for 2027.

Note: 1. Rest of the world has a combined target of 39 GW. The countries include Colombia, Greece, Spain, **Vietnam, and regions of Canada and Australia.**

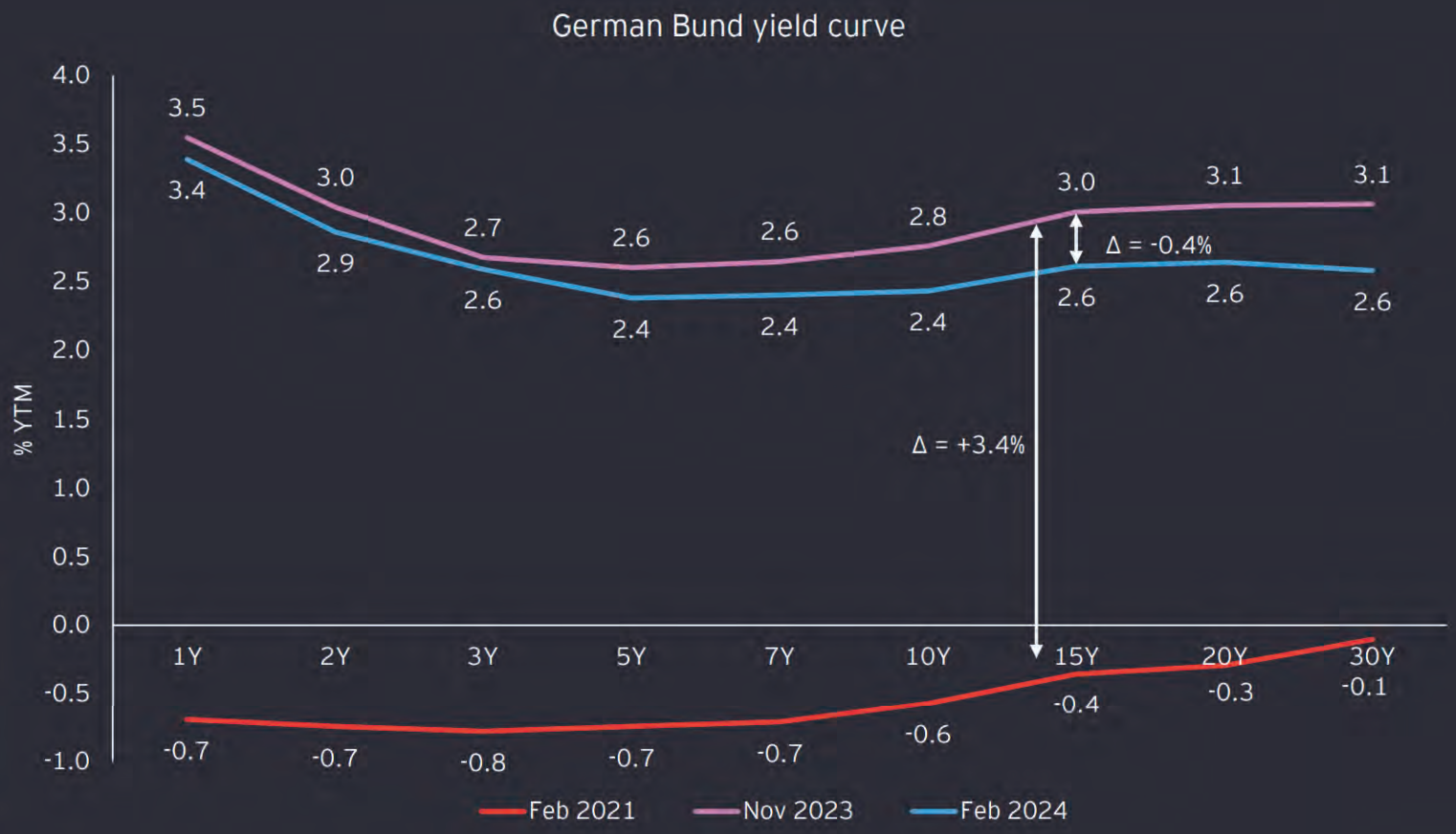
Source: EY analysis of data from Global Wind Energy Council.

Higher interest rates are a major contributor to LCOE increase

- Since the COVID-19 pandemic, there has been a substantial increase in rates across the whole yield curve.
- At the 15-year tenor (aligned with typical renewables debt), curves are now around 2.8% higher than three years ago.
- Rates have recovered slightly from the highs in Q4 23.
- And in the bank market, margins for typical project finance debt for renewables have also widened around 50bp.

3%

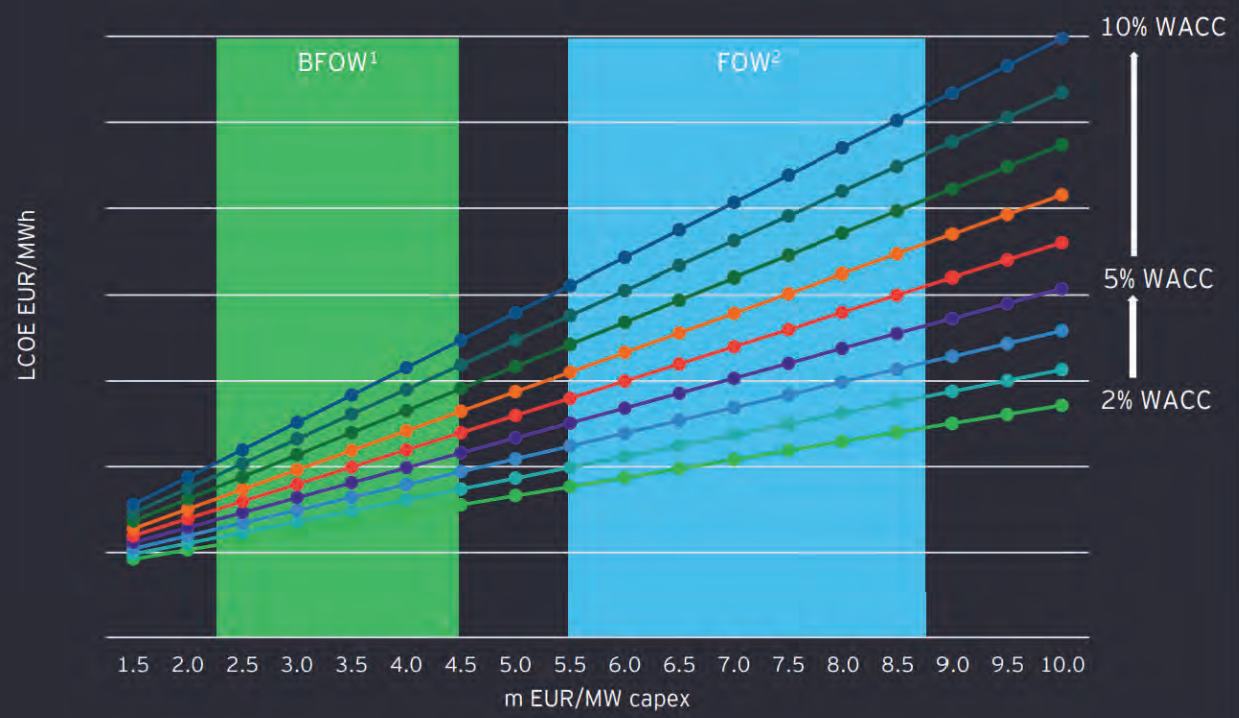
increase in risk-free rates since COVID-19



Sources: CapitalIQ, EY research.

Levelized cost of electricity (LCOE) – compounded impact of rates and costs

LCOE impact of rates and capex for different WACC levels – illustrative



- Perfect storm of higher capex cost and higher interest rates leading to compounded growth in LCOE.
- Inability to hedge rates/capex during development.

Consequences

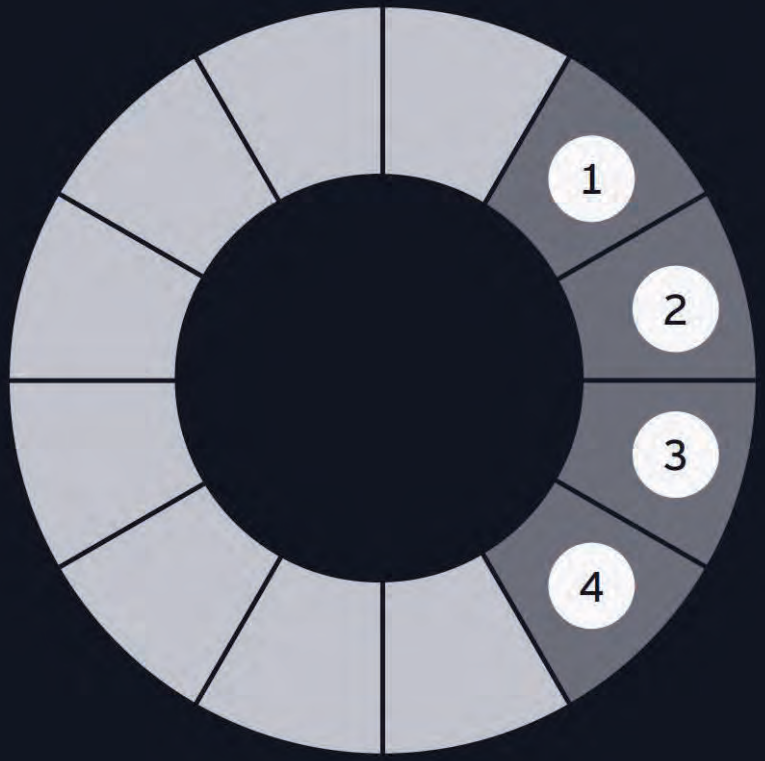
- Higher risk in business cases.
- Inability to hedge.

- Developers are exposed to material risk between securing an offtake and start of construction or financial close.
- Remuneration regimes worked well while rates were low and stable, and capex constantly declined, but the world has changed.

Note: 1. Bottom Fixed offshore wind turbine; 2.Floating offshore wind turbine

Source: EY analysis.

Rethinking regulatory models to cater for a more volatile world

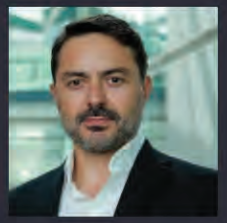


- How should sites and corresponding subsidies be awarded?
- How to allocate and mitigate risk across stakeholders?
- How to shorten time between subsidy award and final investment decisions?
- Why isn't supply chain developing at the pace needed?

We need to move faster to meet our net-zero ambitions.

EY teams are calling on governments to triple global renewable energy capacity to **11,000 GW by 2030.**

For further information, please contact:



Erico Lima

EY Global Offshore Wind Leader

erico.lima@uk.ey.com

+44 7776 171031

EY | Building a better working world

EY exists to build a better working world, helping to create long-term value for clients, people and society and build trust in the capital markets.

Enabled by data and technology, diverse EY teams in over 150 countries provide trust through assurance and help clients grow, transform and operate.

Working across assurance, consulting, law, strategy, tax and transactions, EY teams ask better questions to find new answers for the complex issues facing our world today.

ey.com


venture
TARANAKI
Te Puna Umanga
Ara
Ake
Future
Energy
Development
Aaron Webb
Director, PwC

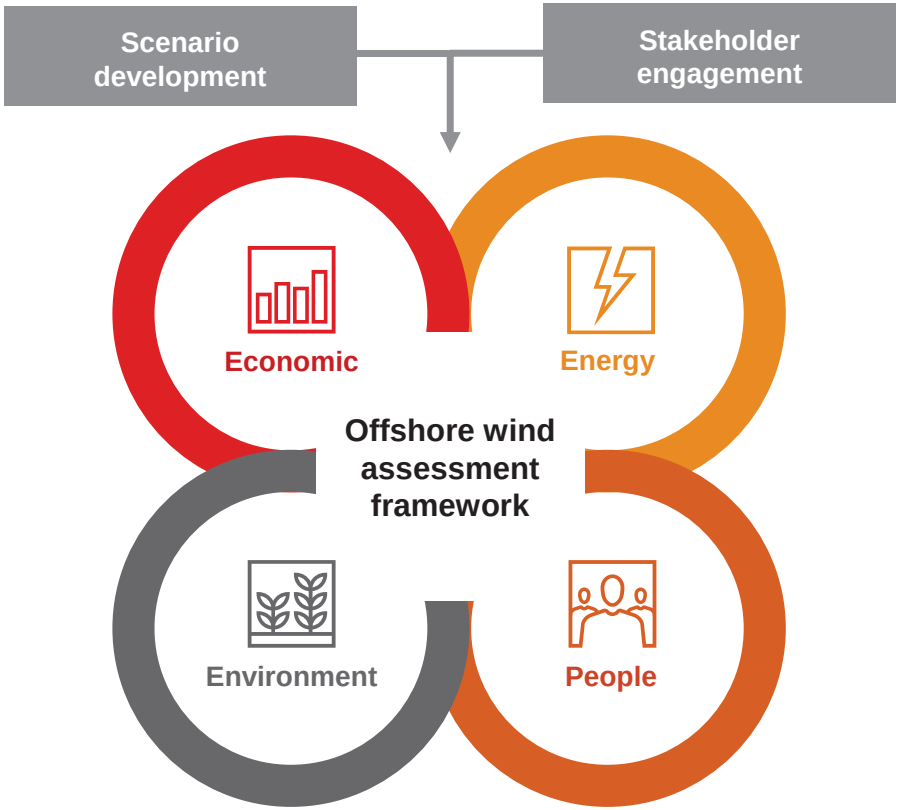
pwc

NATIONAL IMPACT STUDY:

New Zealand Offshore Wind Industry

PRESENTATION | 20 MARCH 2024

The National Impact Study considers the potential future role and impact of an offshore wind industry in New Zealand



1	**The future of New Zealand offshore wind:** Three scenarios for the development of the offshore wind sector
2	**Economic:** Estimate GDP and employment opportunities and impacts on other sectors
3	**Energy:** Explore the contribution offshore wind can make to decarbonisation, energy security and affordability
4	**People:** Consider potential implications for local communities and iwi-Māori
5	**Environmental:** Summarise environmental considerations and potential mitigations

Project steering group members:

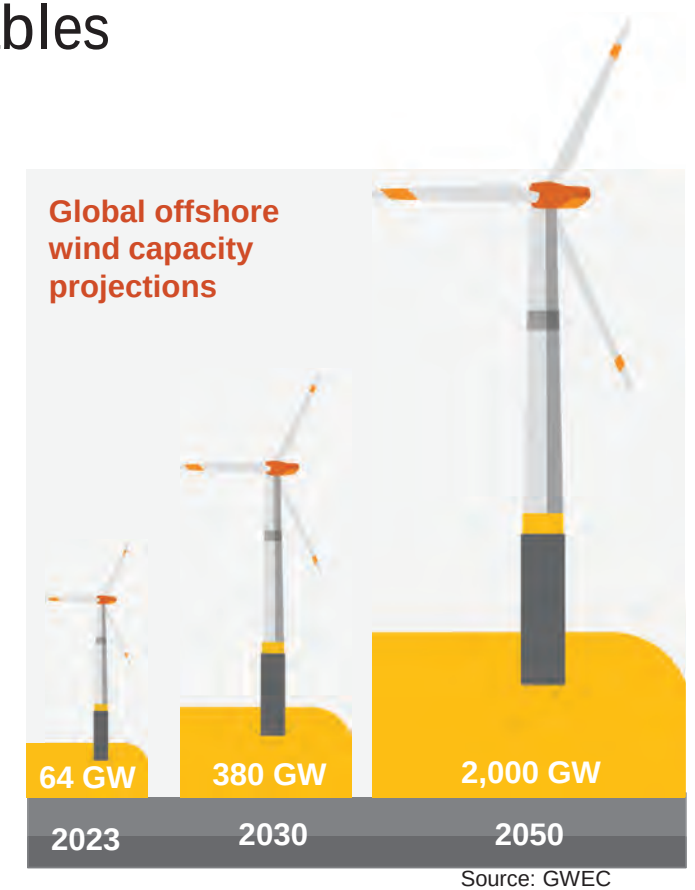
- BlueFloat Energy / Elemental Group
- Business NZ Energy Council (BEC)
- Clarus
- Parkwind
- Port Taranaki
- Powerco
- NZ Trade and Enterprise
- NZ Wind Energy Association
- Sumitomo Corporation
- Taranaki Offshore Partnership
- Te Puna Umanga Venture Taranaki
- Transpower

Concern is growing that the global energy transition is not moving fast enough and we need to scale and accelerate renewables

"To keep on track with net zero emissions by 2050 goals... [global] annual investment in clean energy will have to rise substantially from.... $US1.8 trillion to US$4.6 trillion in 2030" - PwC

- Developing our offshore resource will be strategically important in scaling and accelerating renewable energy:
  - **COP28 global commitment (2050)** **3x renewables**
  - **NZ Government target (2050)** **2x renewables**
  - **NZ energy forecasts (2050)** **1.8x - 3.7x renewables**
- Need to target both **renewable electrons** (eg electrification) and **renewable molecules** (eg hydrogen).
- **Hard to** abate **heavy transport fuels** are a critical challenge requiring hydrogen based PtL solutions

Global offshore wind capacity projections

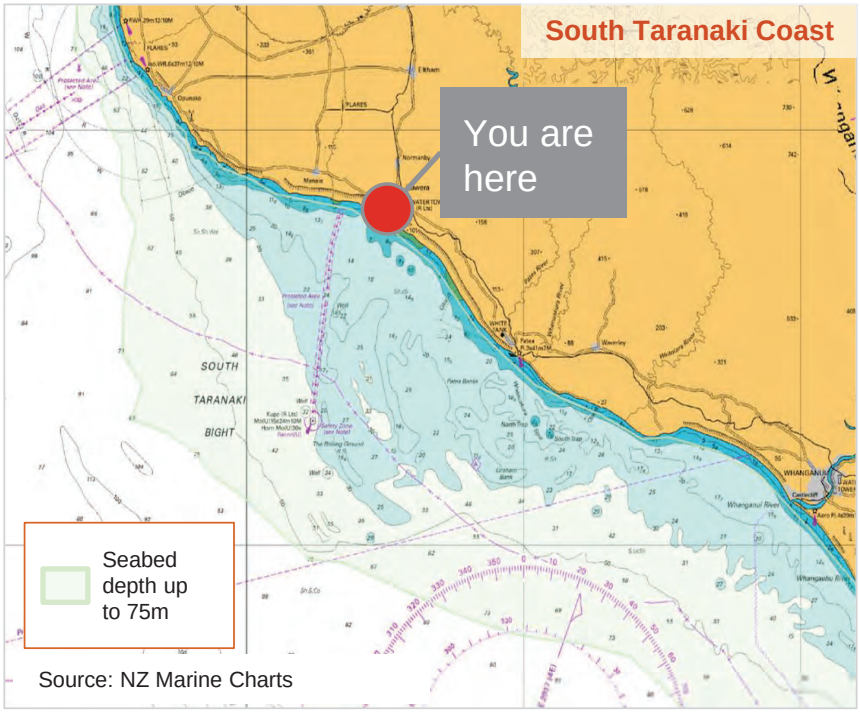


Source: GWEC 2023

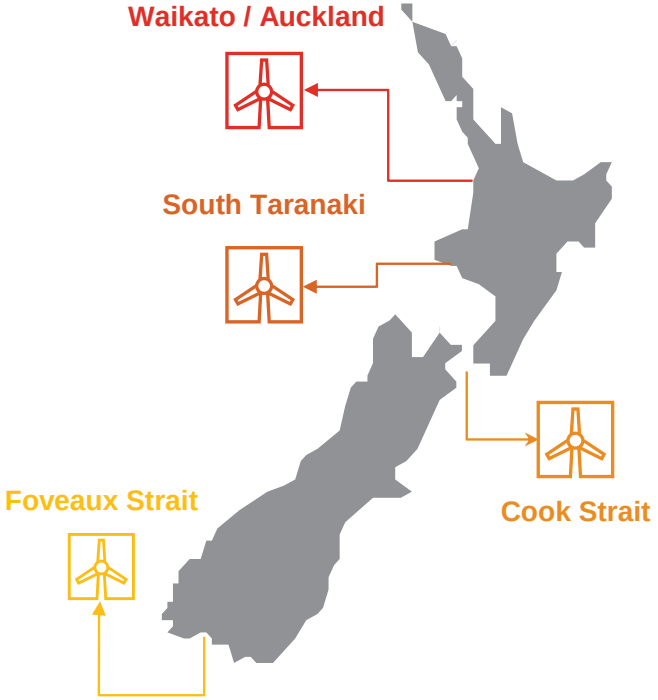
New Zealand has an excellent offshore wind resource that makes us an attractive investment destination

New Zealand offshore wind:

- 9th largest EEZ and coastline
- ‘Roaring forties’ latitudes with superb wind speeds
- Estimated generation capacity factors of 45%-55%
- Fixed pile can currently be built in coastal water depths of less than 75m
- Much greater potential for developing floating offshore, once commercialised



Source: NZ Marine Charts



To explore the future of the industry, three scenarios of offshore wind uptake were developed based on a synthesis of industry forecasts

Future demand

- New industrial load
- \+
- Green hydrogen
- \+
- Grid

How we built up these scenarios?

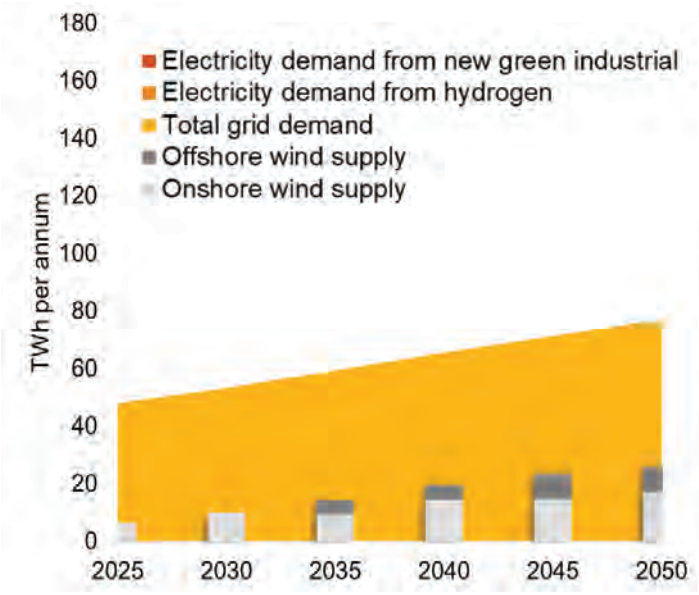
	Grid Electrification	Green Hydrogen	New Green Industry
Electrification	Average of recent industry scenarios	-	-
Electrification Plus		H2 Scenarios - Low	1x Tiwai eq.
Green Vision		H2 Scenarios - High	2x Tiwai eq.

We use existing energy industry scenarios and PwC analysis to build up a view of New Zealand electricity demand growth from:

- grid based electrification
- P2X / hydrogen production
- new green industry opportunities.

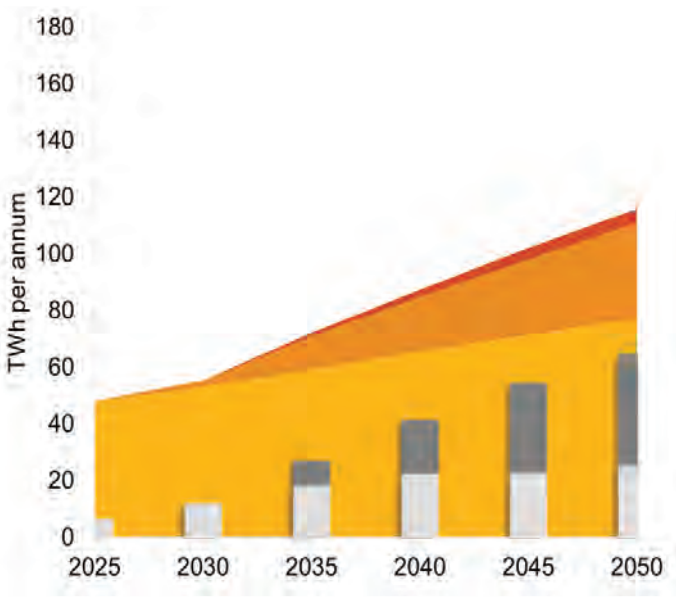
Between 8.8 TWhs and 74.4 TWhs of offshore wind generation is projected across these scenarios

1. Electrification - Forecast electricity demand (net) and wind supply



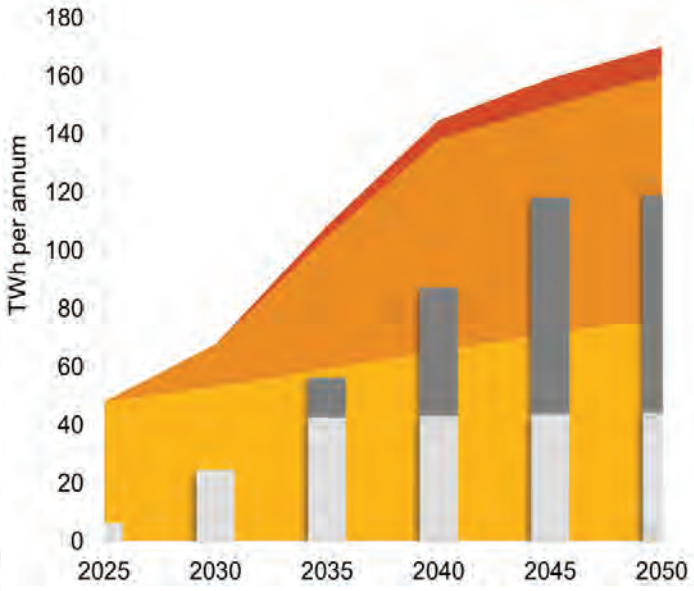
Annual Generation: 8.8 TWhs
Capacity: 2 GW

2. Electrification Plus - Forecast electricity demand (net) and wind supply



Annual Generation: 39.3 TWhs
Capacity: 8 GW

3. Green Vision - Forecast electricity demand (net) and wind supply



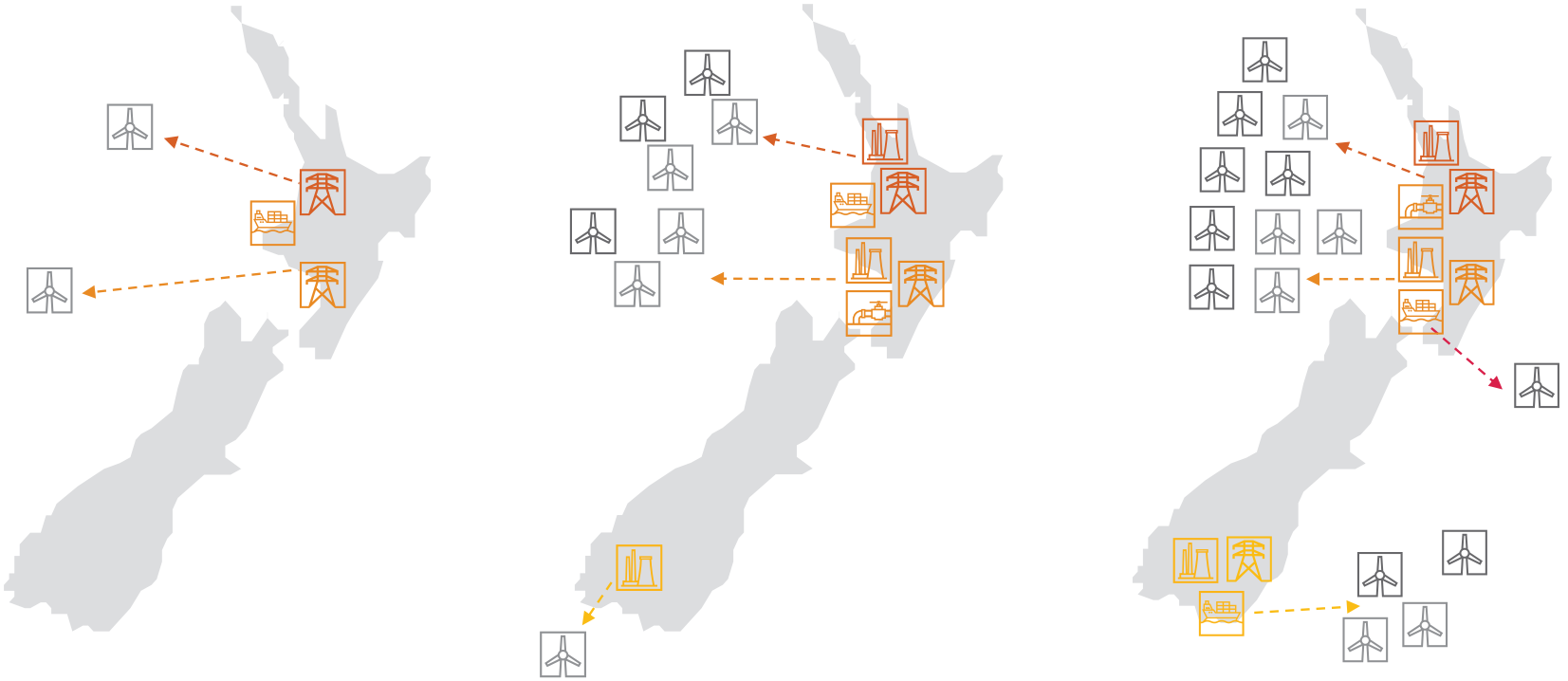
Annual Generation: 74.4 TWhs
Capacity: 15 GW

The study highlights the essential role of ports and energy infrastructure, which will need to lead OWF developments

1. Electrification

2. Electrification Plus

3. Green Vision



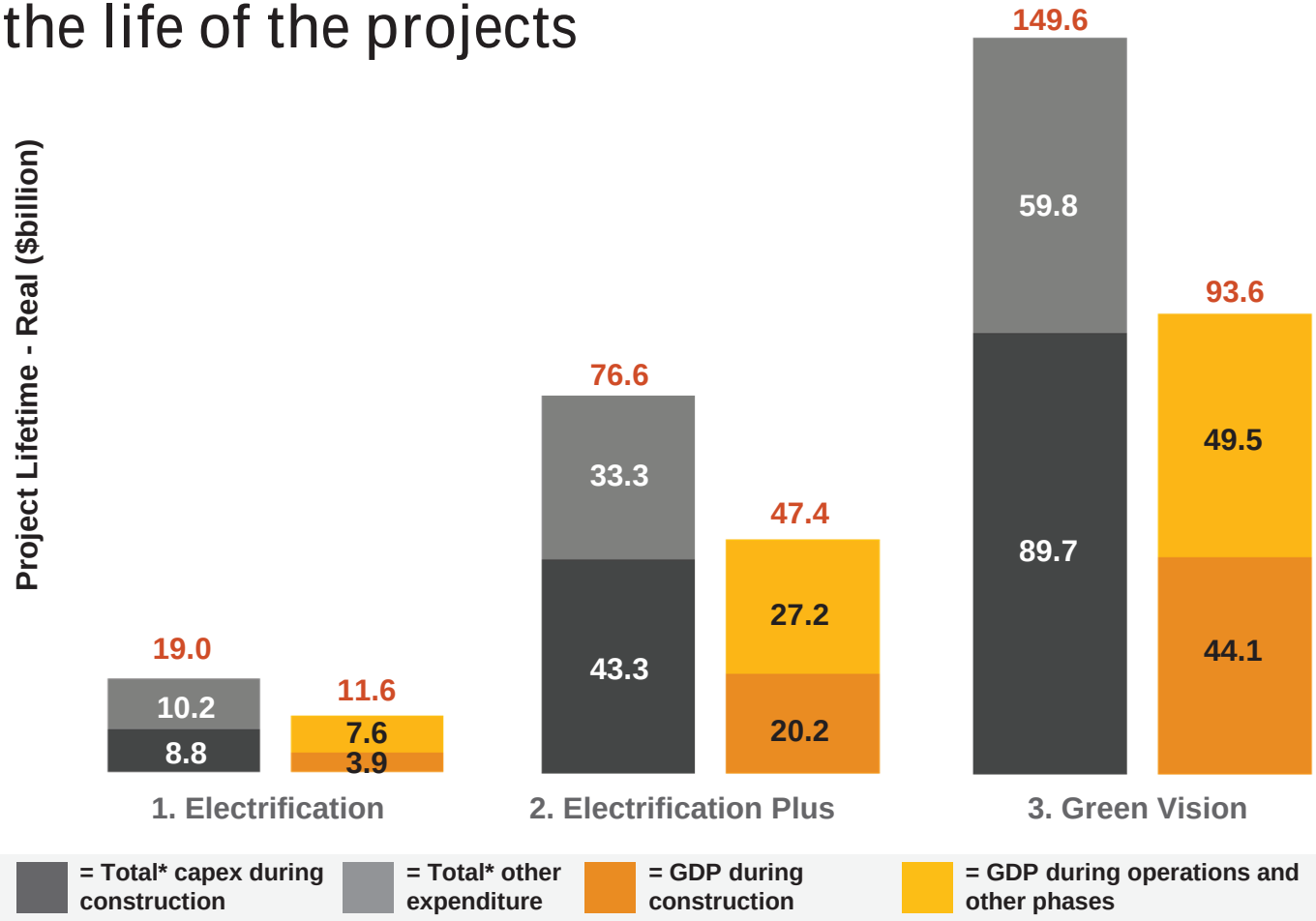
= 1 GW Fixed | = 1 GW Floating | = Port upgrades | = Transmission upgrade | = Direct connection or hydrogen pipeline

Multi-port strategy requiring upgrades to facilitate construction and operations of offshore wind. ~$320 to $720m of expenditure.

Transmission upgrades crucial to unlocking offshore wind. $120m - $160m for first two OWFs.

H2 pipeline infrastructure important to unlock higher levels of offshore wind out of Taranaki.

An offshore wind sector is estimated to generate $12b to $94b GDP over the life of the projects



Offshore wind
2040 GDP real

NZ $0.5 billion to $4.3 billion

NZ Oil and gas sector
2023 GDP

NZ $3.6 billion

Future NZ hydrogen sector
2040 GDP real

NZ $1.7 billion to $4.8 billion

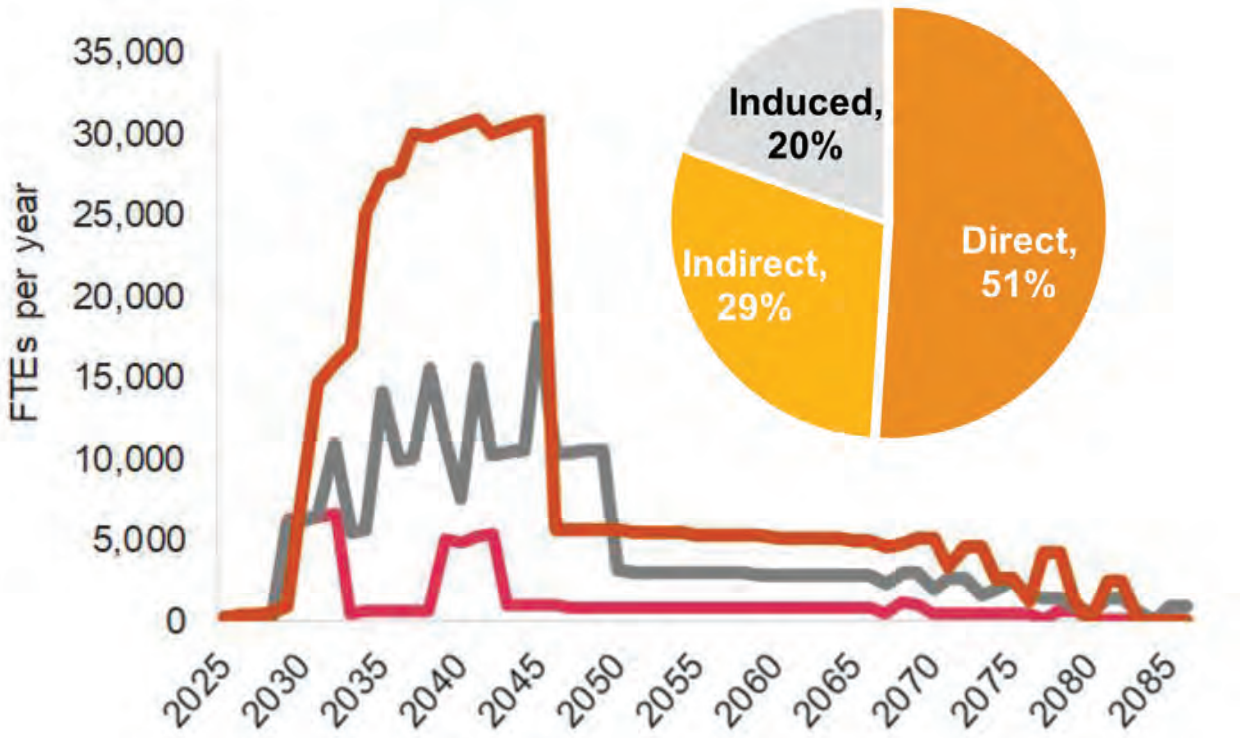
*Local and overseas

An offshore wind sector is estimated to create between 5,300 and 30,000 domestic jobs over the peak of the construction phase

Key observations:

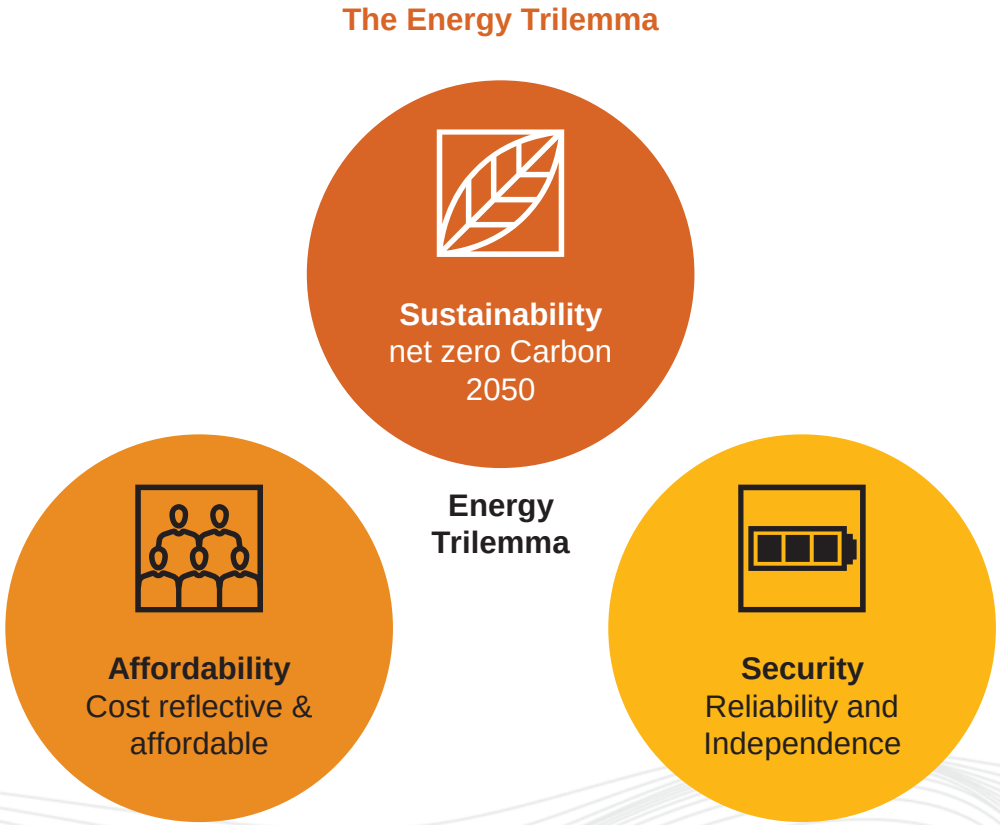
- A mix of general and highly skilled jobs are required in each phase
- Significant flow on job creation with half of jobs being indirect and induced roles
- Workforce synergies can be leveraged from the Taranaki based offshore oil and gas sector
- The offshore wind industry will create a ripple effect impacting many other sectors, from maritime activities to retail and education.

Total employment contribution of the sector
Under the three scenarios



Offshore wind could make a significant contribution to New Zealand balancing its Energy Trilemma goals over the energy transition

- **Sustainability:** offshore wind could play a critical role in accelerating and scaling electrification and a domestic P2X and hydrogen economy
- **Affordability:** As with other renewable technologies, the cost of offshore wind is projected to fall rapidly with improvements in technology, global manufacturing scale and our understanding of the offshore resource.
- **Energy security and independence:** While an intermittent source of energy, offshore wind can support higher levels of energy security and sovereignty through diversity of supply and support for domestically produced renewable fuels.



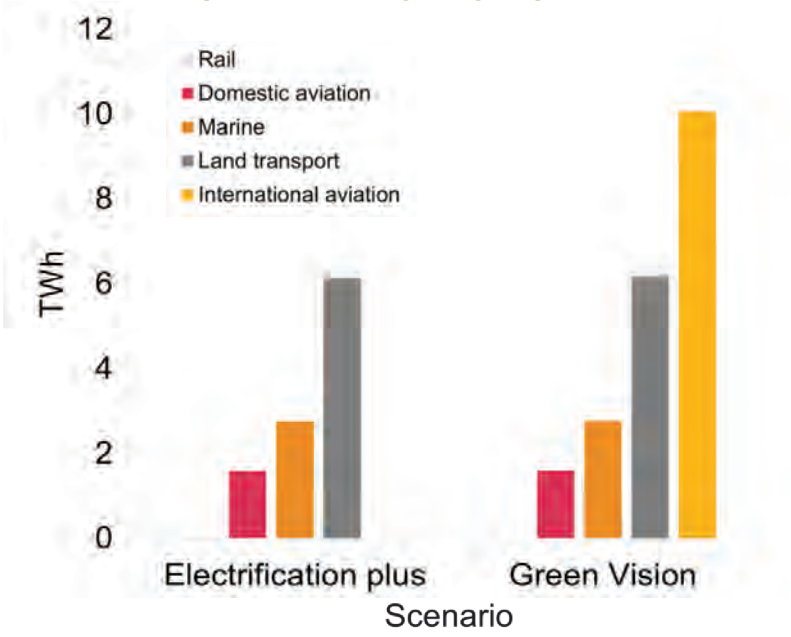
Beyond electrification, offshore wind could have a vital role in decarbonising hard to abate heavy transport fuels through PtL technology

SAF: hydrogen based e-SAF is being investigated for short and long haul flights. The EU recently mandated that 35% of jet fuels need to be e-SAF by 2050.

Marine: In 2023, the International Maritime Organisation (IMO) committed to net zero emissions in shipping by 2050 & 10% near zero emission fuels by 2030.

Freight: hydrogen fuel cells and hydrogen - diesel blends are already being piloted by New Zealand freight trucking companies.

Generation supply required for transport related hydrogen production

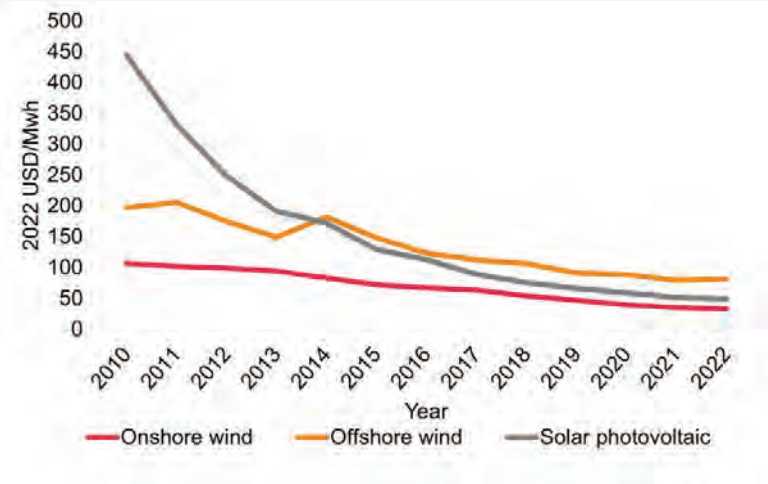


Source: PwC, EY/MBIE

The cost of offshore wind is projected to fall with improvements in technology, manufacturing scale, funding, and experience of the resource

Global cost of offshore wind dropped 60% between 2010 and 2022

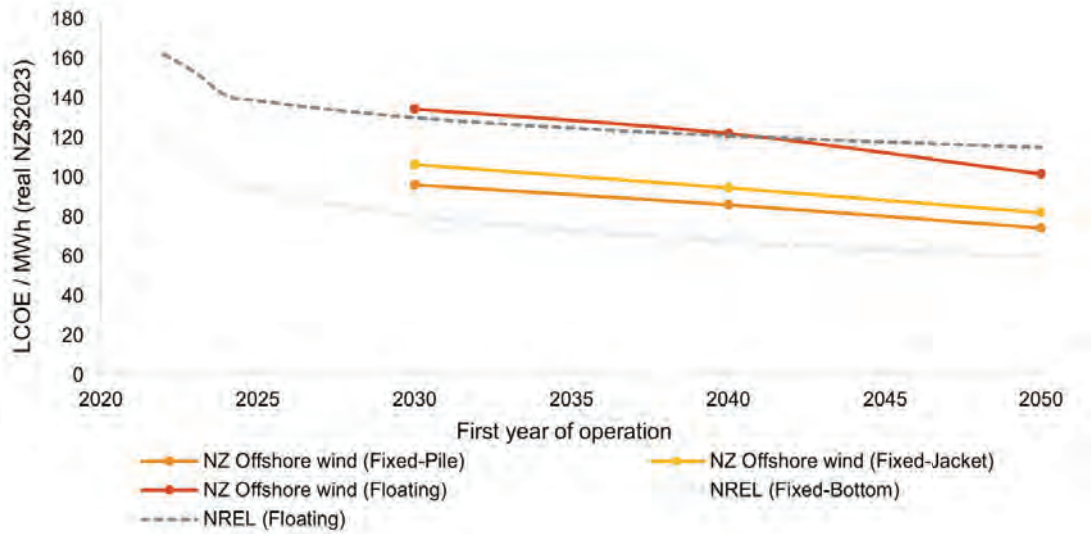
Generation - Levelised cost of energy (LCOE)



Source: Lazards

NZ offshore wind costs are projected to fall to about the current cost of onshore wind by 2050

New Zealand offshore wind - Levelised cost of energy (LCOE)

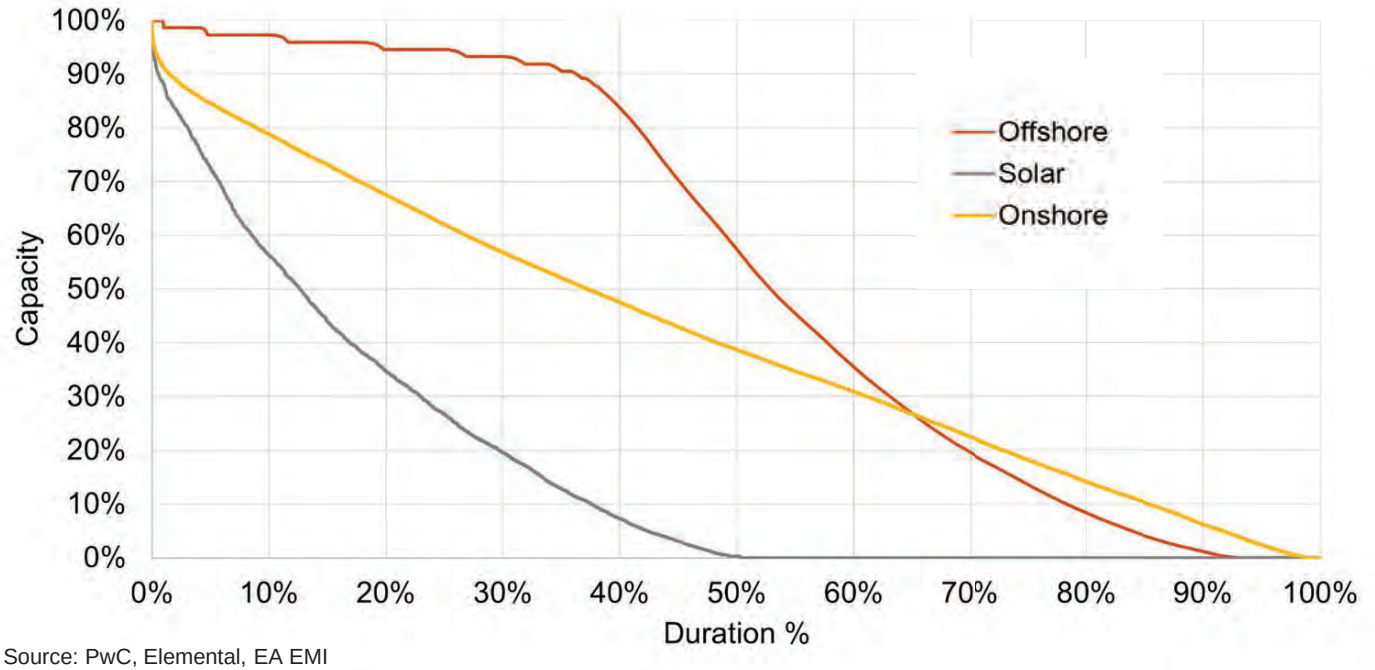


Source: NREL, PwC

While an intermittent source of energy, offshore wind can support higher levels of energy security

Offshore wind harnesses a more powerful ocean wind resource - generating more power, more often, more efficiently

Capacity duration curve - wind and solar



Source: PwC, Elemental, EA EMI

- Higher capacity factors of 45%-55%
- Operates at >85% of capacity 40% of the time
- A diversified portfolio of offshore and onshore wind will support more consistent levels of renewables
- Offshore wind may support improved winter and dry year energy security as production peaks during winter when solar generation and hydro lake inflows are lowest.
- Can also support:
  - Batteries
  - Flexible hydrogen electrolyser production
  - new blended hydrogen and natural gas turbine peaker units.

Source: NREL, PwC

Community impacts

1. **Labour and economic:** OWFs will support 5,000 to 30,000 jobs and significant commercial activity creating new opportunities and strengthening sectors affected by the energy transition.

2. **Community:** OWFs can be divisive. Views range from pride in sustainability, jobs and economic opportunities through to concern over natural and observational effects. Small communities are often most affected.

3. **Construction:** While construction may create localised and temporary impacts, these are lower for OWFs as marshalling and construction occurs at the port or out at sea.

4. **Observational:** A key potential benefit of OWFs is they are typically located at large distances from communities, reducing visual and noise impacts. Placement and community engagement is important.

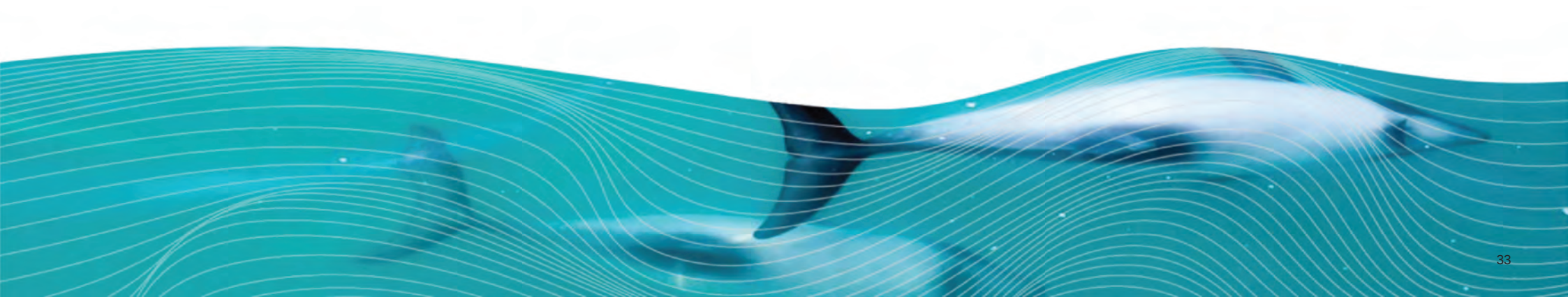
5. **Recreational** impacts are expected to be minor (eg perceived changes in surf) with potential benefits for tourism and recreational fishing

Developers are working together with Iwi-Māori to explore roles and mutual opportunities in offshore wind together

- **Iwi-Māori interests in offshore wind concern:**
  - use of the sea and land in customary iwi-hapū homelands (Mana Moana)
  - impacts on existing rights (eg fisheries and aquaculture)
  - Economic, educational and social development opportunities for Māori in offshore wind and supporting activities
  - traditional roles as ‘kaitiaki o te moana’ (guardians of the sea).
- Dialogue between iwi-Māori and the Crown on the regulatory roles and economic opportunities in offshore wind will allow for both Treaty partners to make decisions on what is in the best interests of all New Zealanders.

Rapid decarbonisation will require trade offs to be made, but work to mitigate and reduce negative environmental effects remains important

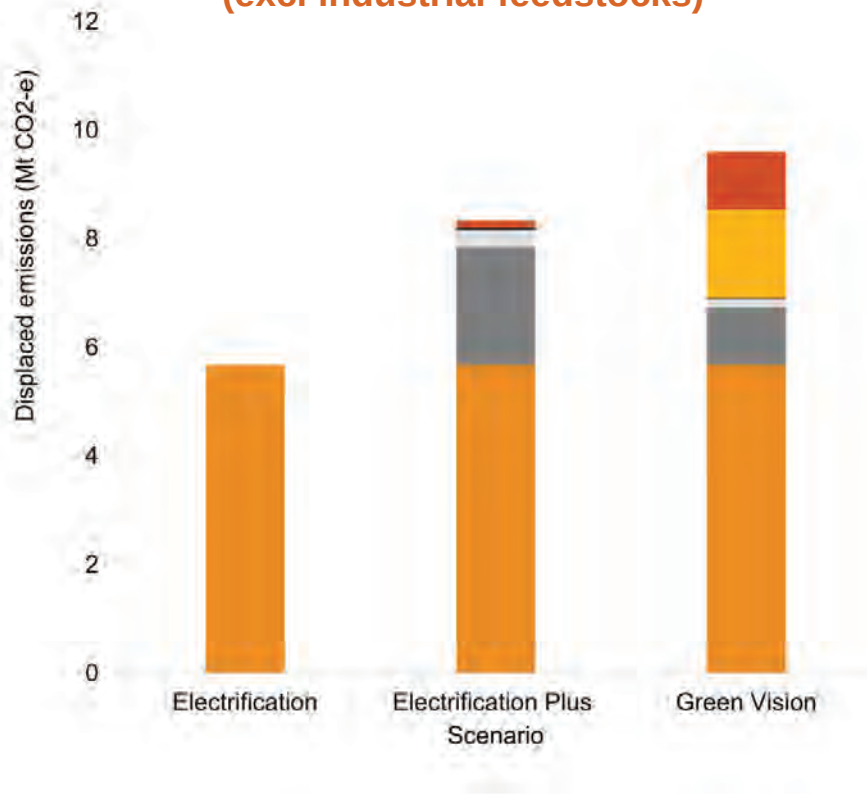
- **New Zealand need to significantly scale renewable energy** in order to meet decarbonisation commitments
- Any **human activity will impact on the natural environment,** but the **impact from climate change may be bigger**
- It will be critical in our energy transition to **find solutions that have the lowest environmental impact and highest decarbonisation potential**
- **OWFs are potentially a good solution,** they offer abundant renewable energy and have the lowest emissions intensity with relatively lower impacts on flora and fauna
- Key to maximising the OWF opportunity is **prudent location choice** and **research into how the natural environment will be affected**, which the regulatory regime can facilitate.



Of all the renewable energy solutions, offshore wind power has the lowest overall life cycle carbon footprint

- Advantages for offshore wind are its:
  - **Ability to scale renewables**
  - **Lowest emissions intensity**
  - **Minimal footprint**
  - **Lower opportunity cost** of the space it uses.
- Offshore wind has a **short carbon payback period** of only 5-12 months, which is negligible given the general operation lifetime of 30 years
- We estimate that offshore wind could enable an **18% to 30% reduction in national energy related emissions (excluding industrial feedstocks)**.

2050 annual emissions reduction from offshore wind (excl industrial feedstocks)

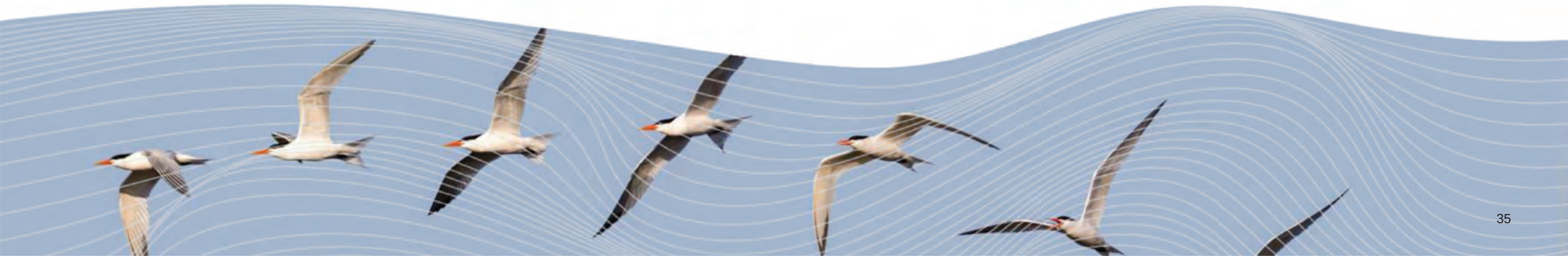


Potential environmental impacts from offshore wind on marine flora and fauna in NZ are largely unknown due to a lack of data

The potential impacts of OWFs on flora and fauna have been considered in six distinct categories:

1. Marine mammals
2. Fish (finfish, sharks and rays)
3. Benthic (seabed) communities
4. Seabirds
5. Flora (sea plants such as kelp)
6. Ocean and atmosphere more generally

- Many of the potential effects on marine life occur during the construction phase, predominantly as a result of **sediment plumes, noise and vibration from pile driving.**
- The **location and foundation type of an OWF** will therefore be an important consideration.
- In determining the location of a wind farm, consideration should be given to the **habitats and migration pathways of threatened, sensitive or endangered species.**
- Once established, OWF turbine infrastructure often results in beneficial enduring support for marine biodiversity by **creating new habitats and increasing food availability,** through the ‘artificial reef’ effect.
- **Mitigations are being investigated** to address these impacts including ‘**bubble curtains’** to reduce noise and vibrations, **monitoring of threatened species** and **activity restrictions at times of greatest risk.**



Question & Answers

Image: Descending from Wind Turbine, Northwester 2, Belgian North Sea, Courtesy of Parkwind

Thank you

pwc

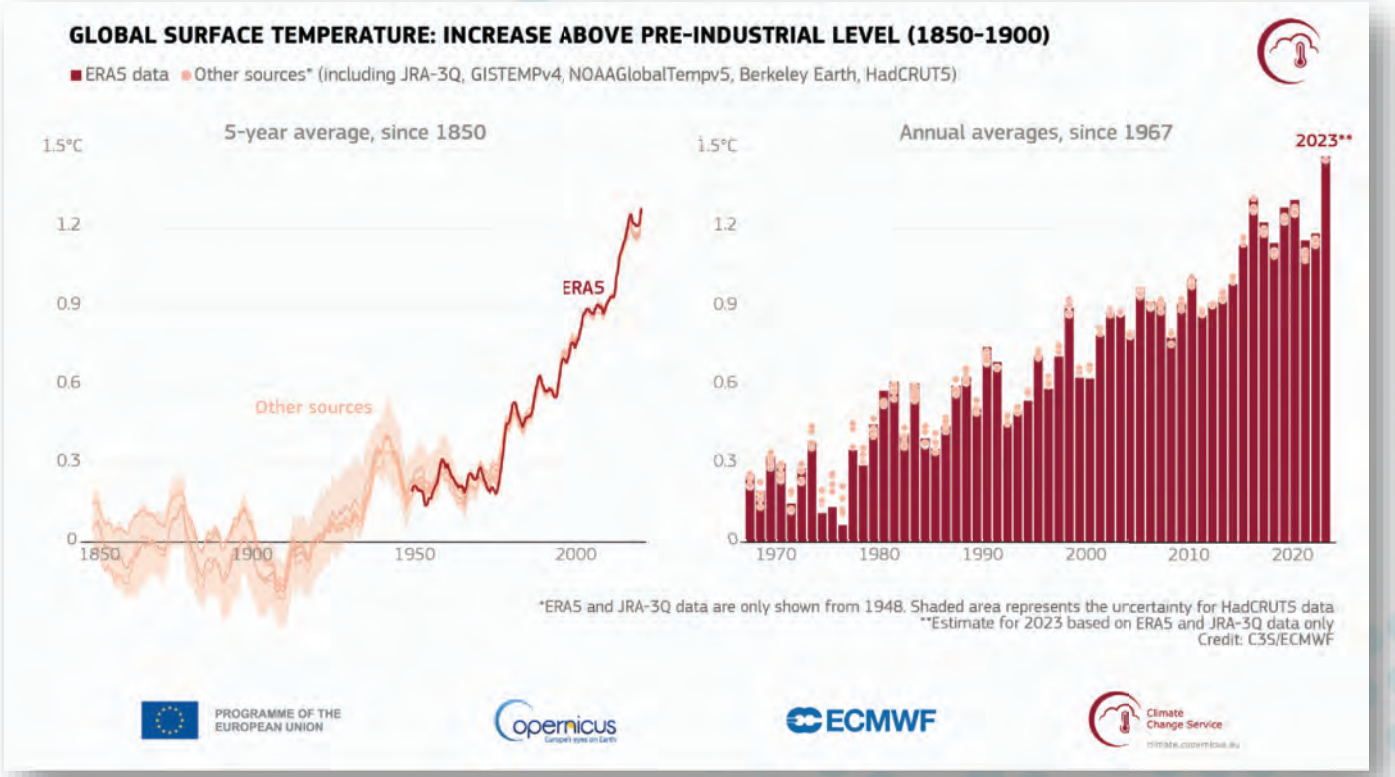
Nathan Turner

Country Manager (NZ), BlueFloat

BlueFloat Energy & Elemental Group

Offshore Wind in Aotearoa

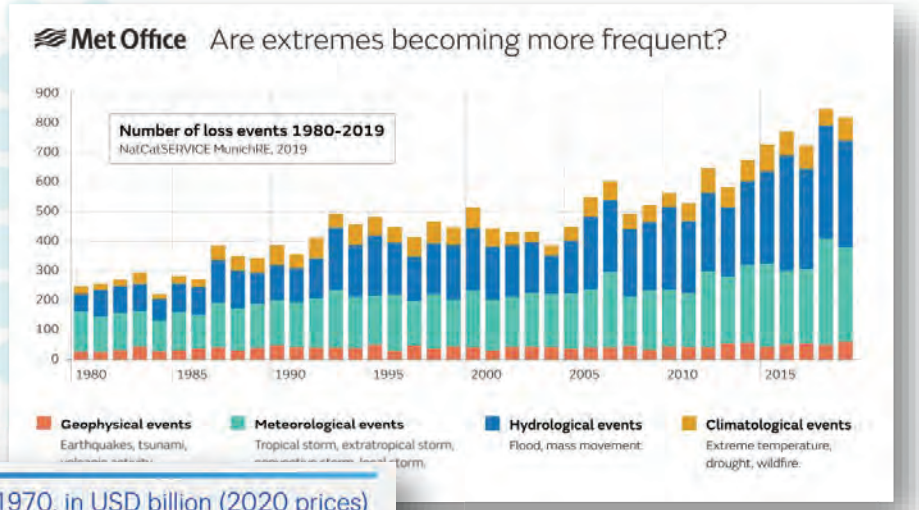
Why are we here?

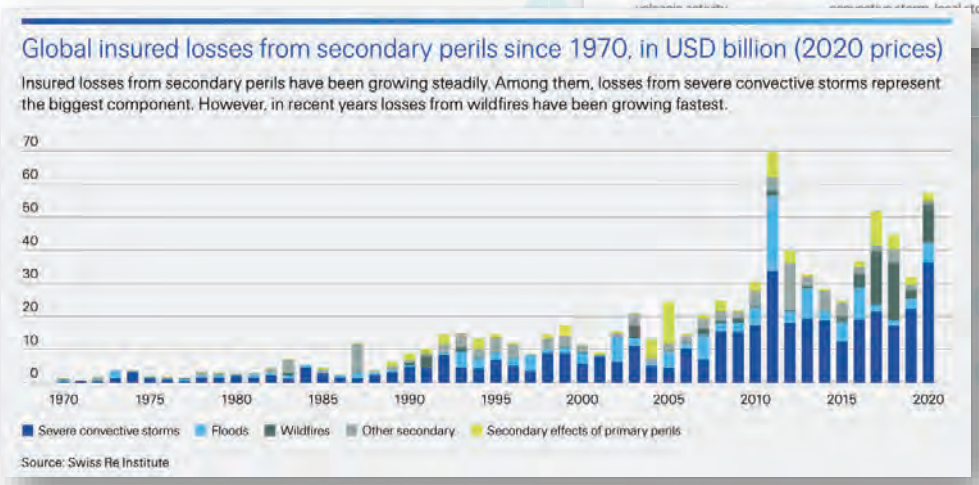


WAIKATO Offshore Wind

SOUTH TARANAKI Offshore Wind

Extreme weather becoming more frequent, driving up costs





WAIKATO Offshore Wind

SOUTH TARANAKI Offshore Wind

We have made international commitments to reduce emissions

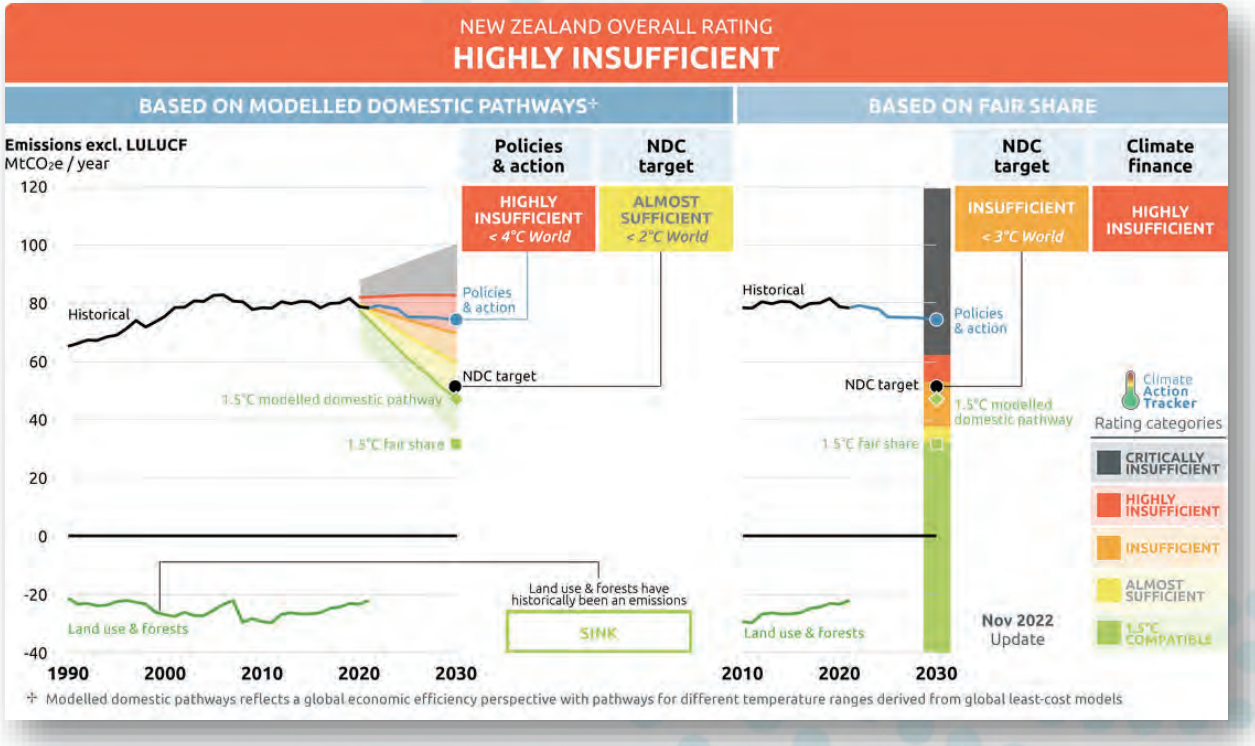
The domestic 2050 target requires at least:

net zero	10%	24 to 47%
emissions of all greenhouse gases other than biogenic methane by and beyond 2050	reduction below 2017 biogenic methane emissions by 2030	reduction below 2017 biogenic methane emissions by and beyond 2050

WAIKATO Offshore Wind

SOUTH TARANAKI Offshore Wind

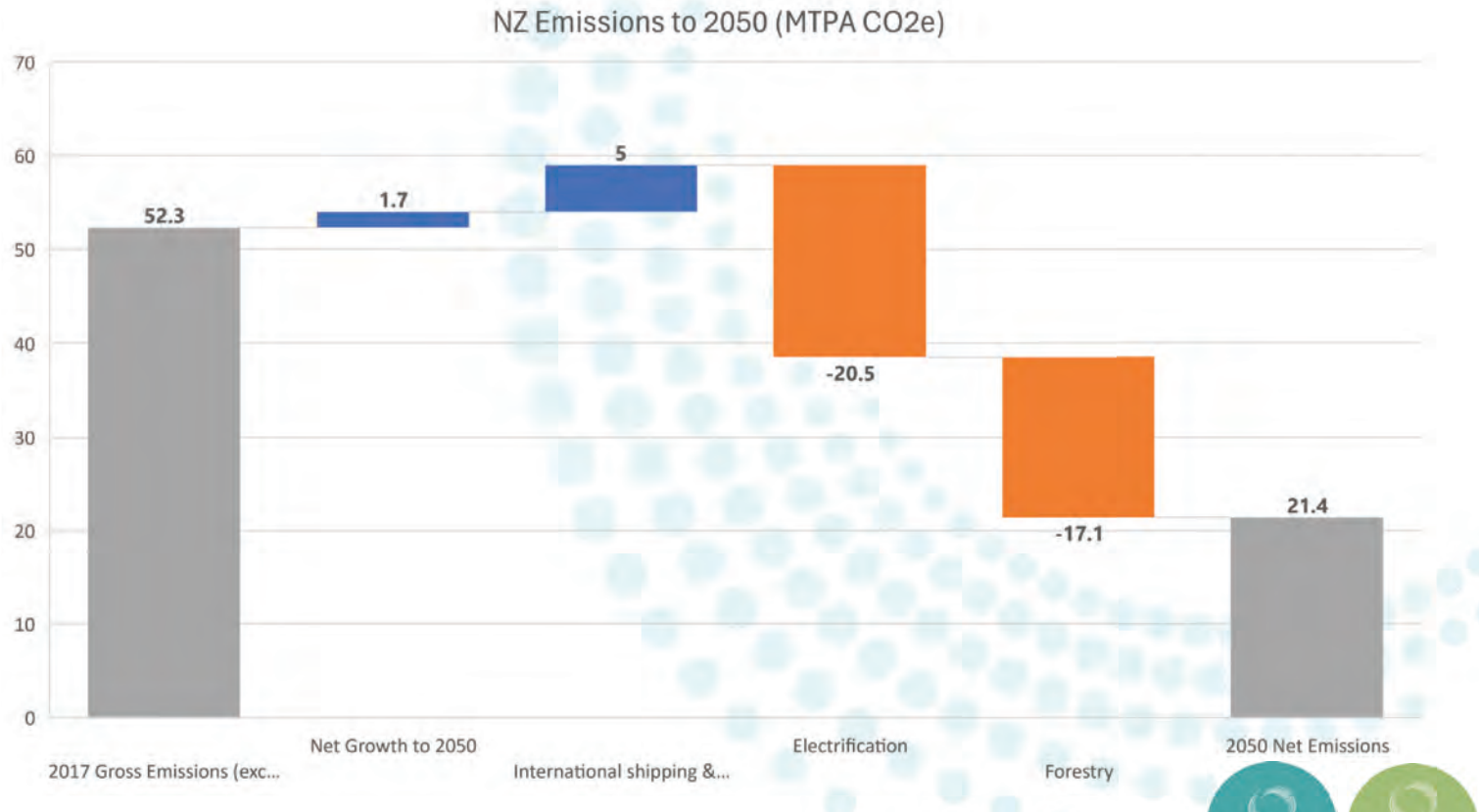
But we are not on track to meet those commitments



WAIKATO Offshore Wind

SOUTH TARANAKI Offshore Wind

Electrification is critical, but not sufficient – let's not be complacent

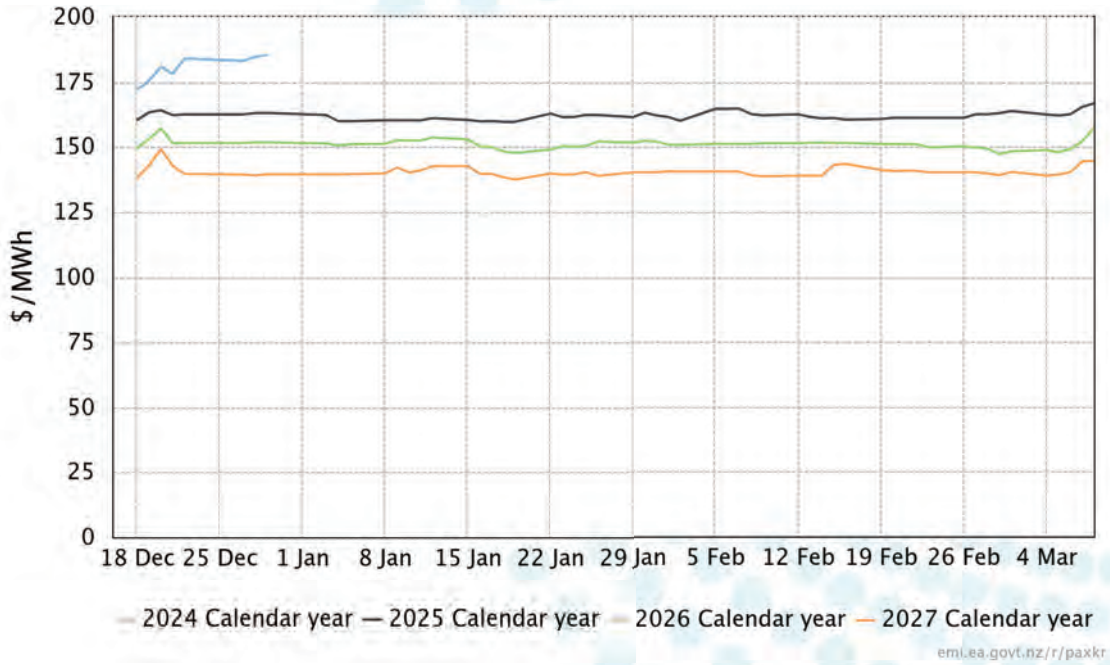


Figures in chart taken from Transpower Whakamana I Te Mauri Hiko with the Climate Change Commission's estimated emissions from international shipping and aviation added.

WAIKATO Offshore Wind

SOUTH TARANAKI Offshore Wind

Long term power prices remain well above LCOEs



2024-2027 Futures contracts per EMI website 11 March 2024.

Why are WE here?

BlueFloat ENERGY

A leading offshore wind developer with a global pipeline of fixed and floating projects

Elemental Group

A pioneer in the offshore wind sector in New Zealand

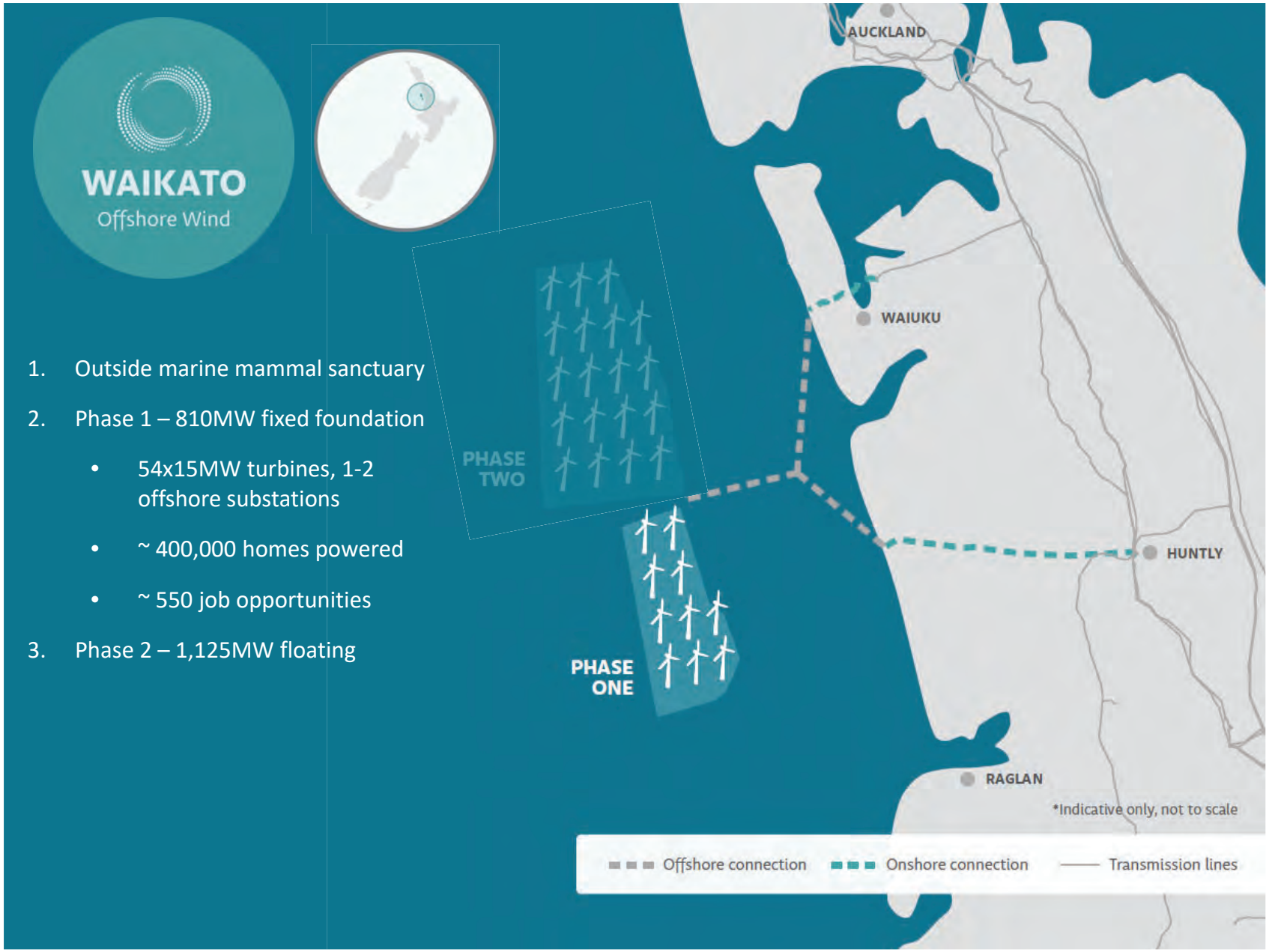
Our development principles

- Partner with Māori, as kaitiaki, co-governors, owners and joint-venture partners
- Focus on enduring beneficial community-centred outcomes aligned with te ao Māori
- Committed to biodiversity and marine environment restoration and regeneration
- Collaborate with wider energy market participants and support common infrastructure solutions to reduce impact
- Explore synergistic activities such as aquaculture and fisheries
- Create and deliver skills, training and education
- Prioritise local procurement and employment
- Accelerate Aotearoa reaching its Net Zero targets

WAIKATO Offshore Wind

SOUTH TARANAKI Offshore Wind


SOUTH TARANAKI
Offshore Wind
1. Outside marine mammal sanctuary
2. Fixed foundations
3. 60 x 15MW turbines, 1-2 offshore substations
4. ~600,000 homes powered
5. ~600 job opportunities
NEW PLYMOUTH
STRATFORD
ŌPUNAKE
HĀWERA
PATEA
*Indicative only, not to scale
Offshore connection
Onshore connection
Transmission lines


WAIKATO
Offshore Wind
1. Outside marine mammal sanctuary
2. Phase 1 – 810MW fixed foundation
• 54x15MW turbines, 1-2 offshore substations
• ~ 400,000 homes powered
• ~ 550 job opportunities
3. Phase 2 – 1,125MW floating
PHASE TWO
PHASE ONE
AUCKLAND
WAIUKU
HUNTLY
RAGLAN
*Indicative only, not to scale
Offshore connection
Onshore connection
Transmission lines

Building social license is key

"Will the overhead transmission lines go out to sea?"

"Are you fully backed by public money?"

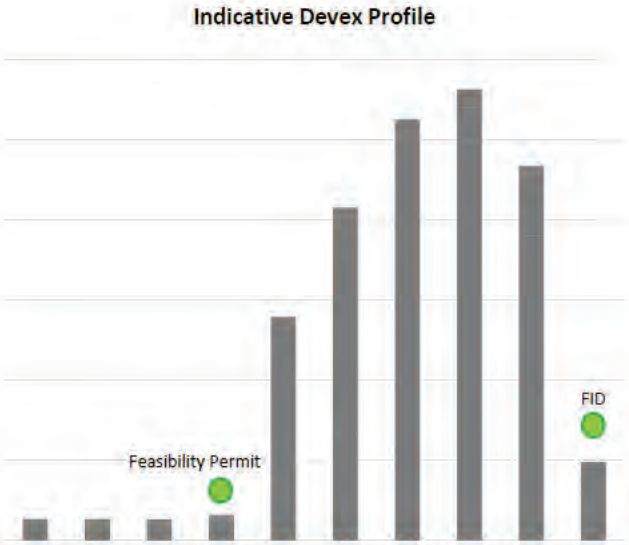
"Do the blades fall off into the ocean?"

"How much oil is used to run the turbines?"

Workstream update

Completed	Underway, pre-permit
☑ Constraint mapping and site selection	↻ Environmental baseline design
☑ Environmental desktop study	↻ Engineering concept design
☑ Wind resource assessment	↻ Species sensitivity studies
☑ MetOcean study	↻ Transmission route assessment
☑ Geological study	↻ Surf impact assessment
☑ Ports and installation strategy	↻ Cultural impact assessment
☑ Kupe LiDAR deployed	↻ Regulatory consultation
☑ Transpower concept assessment	↻ Permit application readiness
☑ Grid system study	↻ Decommissioning strategy
☑ O&M vessels and ports assessment	↻ Workforce development roadmap
☑ National impact study	
☑ Community education materials	

Ongoing
↻ Iwi partnerships
↻ Community engagement
↻ Offtake discussions
↻ Supply chain development



Peter Spencer

Country Manager (NZ), Parkwind

PARK WIND
JERA GROUP

Key Updates March 2023-2024:

JERA acquisition of **Parkwind** : July 2023

Who are JERA:

- Established in April 2015 based on an alliance between Tokyo Electric Power Company and Chubu Electric Power Company. Headquarters in Tokyo.
- One of the world's largest power generation companies, it operates an entire supply chain, from upstream fuel and procurement to project development and power generation.
    - Largest generation capacity in Japan, 61GW – mostly thermal (NZ total capacity approx. 9GW)
    - 12GW of generation capacity in over 10 countries, worldwide – 2.4GW renewables
    - JERA established the "JERA Zero CO_2 Emissions 2050 Roadmap for its Business in Japan
        - Interim targets of 20% reduction of CO_2 by 2030 and 60% by 2035
        - Aims to do this by adoption of renewable energy, primarily offshore wind and batteries
        - Shut down of inefficient coal powerplants, cofiring with low carbon fuels (eg ammonia, H2)

JERA's interest in Parkwind:

- Parkwind's 5 operational offshore windfarms complement/diversify JERA's existing renewable portfolio
- Parkwind's strong development and EPC capabilities as well as proven track record of operational excellence help JERA meet its long-term goal to scale up renewable energy globally.
- Vertically integrated platform with cutting-edge in-house expertise across entire OSW value chain
- Strong track record of pioneering in a now well-established OSW market

Our global Offshore Wind Portfolio

PARK WIND
JERA GROUP

- JERA aims to increase our renewable energy assets from 2.46GW to 5GW by 2025.

Offshore Wind Farms in **Belgium**
- **Belwind** Offshore Wind Farm **171 MW**
- **Northwind** Offshore Wind Farm **216 MW**
- **Nobelwind** Offshore Wind Farm **165 MW**
- Northwester 2 Offshore Wind Farm **219 MW**

Offices in **Belgium**
- Ostend
- Leuven

Office in **Ireland**

Offshore Wind Farms in **UK**
- **Gunfleet Sands** Operational **173MW**

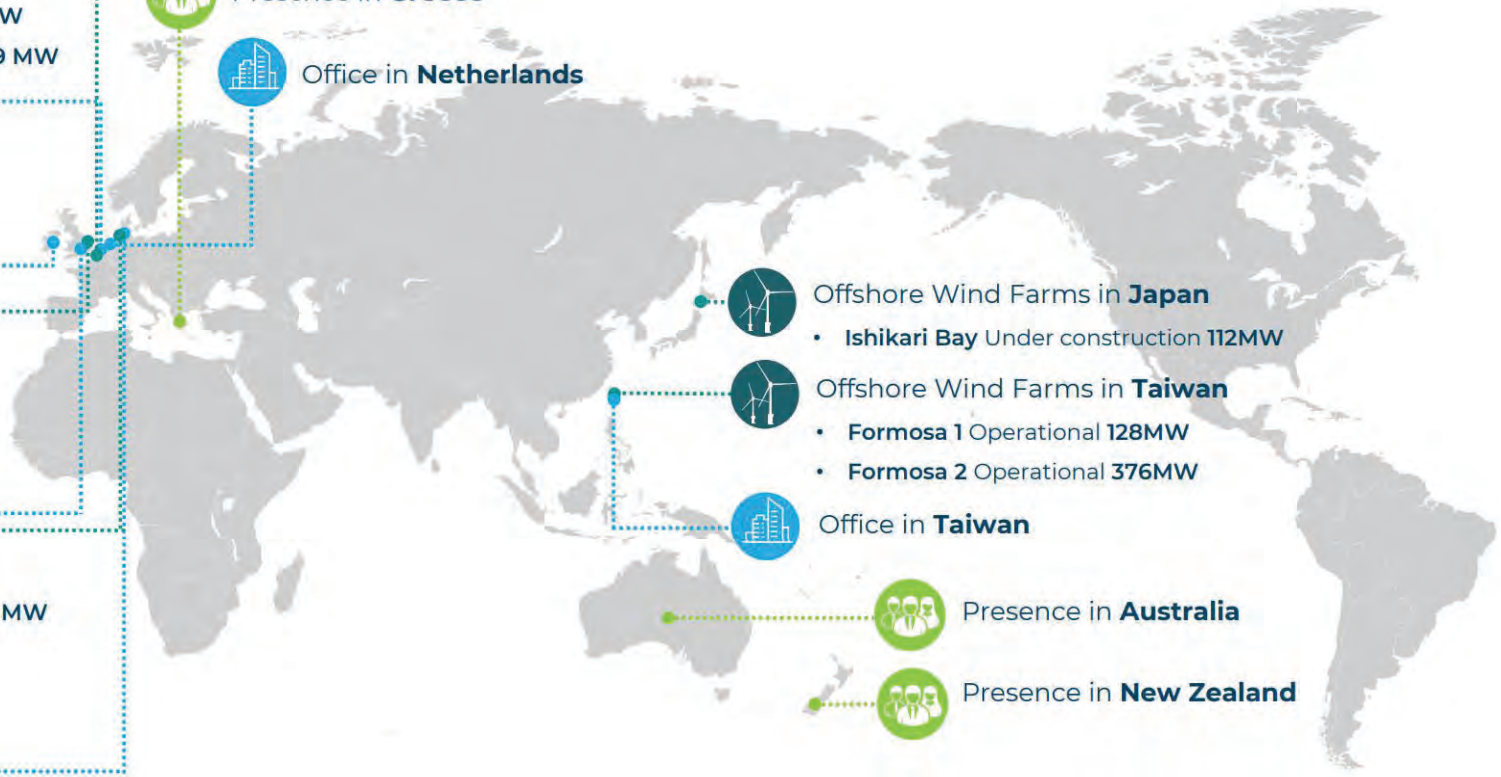
Office in **UK**

Offshore Wind Farms in **Germany**
- **Arcadis Ost 1** Offshore Wind Farm **257 MW**

Office in **Germany**
- Mukran

Presence in **Greece**

Office in **Netherlands**



Offshore Wind Farms in **Japan**
- **Ishikari Bay** Under construction **112MW**

Offshore Wind Farms in **Taiwan**
- **Formosa 1** Operational **128MW**
- **Formosa 2** Operational **376MW**

Office in **Taiwan**

Presence in **Australia**

Presence in **New Zealand**

Parkwind & **Meridian** MoU: October 2023

October 2023: Parkwind and Meridian Energy signed a memorandum of understanding (MOU) for the exploration of offshore wind generation in New Zealand waters.

An alliance which brings together proven offshore wind experience and Meridian's deep-rooted expertise in the New Zealand energy sector.

Depending on the outcome of the joint exploration, the two parties may decide to work towards a feasibility application.

Both parties are interested in long-term investments and relationships, following a build to own and operate business model.

Primary area of interest is South Taranaki.

Current work includes refinement of project origination work undertaken by Parkwind to date.

Meridian.

PARK WIND
JERA GROUP

Advice to **Government** – Regulatory Framework

- Seabed concessions should be awarded through a **rigorous, competitive** and **transparent tender** process
- **Don't rush it** - take the time required to:
  - ensure development of a robust offshore wind regulatory framework that draws the best from relevant overseas precedents but is shaped to deliver for Aotearoa
  - properly engage with mana whenua, mana moana and other key stakeholders
  - **"Fast track"** consent approach may result in **adverse outcomes** the offshore wind industry in the long term **by short cutting appropriate engagement** time with communities and stakeholders.
- **Recognition of iwi and hapū interests** → enable opportunities and ensure Māori interests, rights and responsibilities (e.g. kaitiakitanga) are respected
- Guaranteed and timely grid access → reduces risk resulting in more competitive LCOE
- **Benefit sharing** → Incentivise developers to generate long term benefits (local employment, inbound investment and energy security etc)
- **Apply pre-qualification criteria** for applicants considering **proven track record** in:
  - HSE management
  - Technical and financial competence
- **Avoid pitfalls** such as **landbanking**, **solo developer dependence**, financial auctions, **grid uncertainty**

Community **Educational** Initiatives

We believe in inclusive developments and the importance of supporting local communities who wish to **learn about offshore wind technology**.

June 2023: Te Hā o Tāwhirimātea Study Tour

Parkwind supported the NZTE study tour for iwi leaders and representatives from Taranaki and wider New Zealand to learn about offshore wind in Europe.

The large delegation came to Belgium to get a tour of Parkwind's O&M base in the port city of Ostend, followed by a boat tour of our offshore wind farms in the Belgium North Sea.

March 2024: Offshore Wind Whakamātau - Summer Beach Demo Days

Opportunity for kids, families and anyone interested to learn about offshore wind by building and testing models of offshore wind turbines.

We held the whakamātau at 4 beaches along the South Taranaki coast and ran a school-based workshops at 3 schools in the region.

PARK WIND
JERA GROUP

Offshore Wind 4 Kids

Te Kapohau ki Tai
Rā whakatauira ki tātahi 2024

Ki Waiinu
Hātarei, te 2 o Māehe
Ki te papa puni o Pātea
Hanārei, te 3 o Māehe
Ki Ōpunake
Hātarei, te 9 o Māehe
Ki Kaūpokonui
Hanārei, te 10 o Māehe

Ka pai rānei koe ki te **ako** mō **te hangarau kapohau ki tai?**

Ka pai pea ki a koe te tū hei **ringa hāpai** i **ngā pāmu hau ki tai** ā tōna wā?

E ngā **whānau**, e ngā **rangatahi**, e ngā **tamariki**, **nau mai ki te tākaro tahi me mātou ki tātahi** - ko te kaupapa, he waihanga, he whakamātau hoki i ētahi tauira o ngā kapohau ki tai.

Mā mātou **te rorerore** hei kai mā tātou, he akoranga poto hoki ka rere, **45 mēneti te roa**, i te **10am ki te 4pm.**

Kua herea te nui o ngā tūranga, nō reira me **rēhita** te hunga e hiahia ana ki te whai wāhi mai ki tēnei kaupapa, mā te paehono kei raro iho nei.

www.offshorewind4kids.com/demo-days

Mō ētahi mōhiohio anō i te reo Pākehā, whakapā mai ki a Tania, ki
tania.roach@parkwind.eu
W: 022 682 8465

He mea whakahaere tahi te kaupapa nei e Parkwind me OffshoreWind4Kids.
Nō Paratiamu a Parkwind, he kaiwhakatū, he kaiwhakahaere hoki i ētahi pāmu hau ki tai.
Nō Paratiamu hoki a OffshoreWind4Kids, he whakahaere monihua-kore, e aronui ana ki te mātauranga.

Goals for 2024 & Growing our **local** team

Goals for 2024:

- **Iwi partnerships:** Expand and deepen relationship with iwi
- **Local engagement:** Build on relationships with other local communities
- **Collaboration for appropriate framework:** Continue working with others to help shape regulatory space and offshore wind industry in NZ
- **Feasibility:** Prepare for NZ's first feasibility license application round expected in 2025
- **Technical and environmental:** Continue development activities, technical and environmental

Tania joined us as our local representative in Taranaki last year, welcome on-board Tania!

Giacomo Caleffi

Senior Business Development Manager, COP

2024 Offshore Renewable Energy Forum
Developer update

NZSUPERFUND
Te Kaitiaki Tahua Penihana
Kaumātua o Aotearoa

CIP
Copenhagen Infrastructure Partners

TARANAKI
OFFSHORE PARTNERSHIP
BY
NZ SUPER FUND & COPENHAGEN INFRASTRUCTURE PARTNERS

The partnership

NZ Superannuation Fund

The NZ Super Fund was set up to help the Government meet the future costs of national superannuation. The fund's assets are owned by the Crown on behalf of all New Zealanders, but the fund manager operates on a commercial basis, independently of the Government. We are investing for generations to come, so the likely social and environmental costs and benefits of any activities we finance are fundamental considerations in all our investment decisions.

Copenhagen Infrastructure Partners (CIP)

We are a fund management company, working predominantly with institutional investors. We have an ambition to increase our clean energy investments to over NZD 160 billion by 2030. We already manage the world's largest dedicated greenfield clean energy fund – CI IV, with NZD 12 billion in commitments.

TARANAKI
OFFSHORE PARTNERSHIP
BY
NZ SUPER FUND & COPENHAGEN INFRASTRUCTURE PARTNERS

Taranaki Offshore Wind project

25-40km off the coast of South Taranaki

Water depths 25-60m

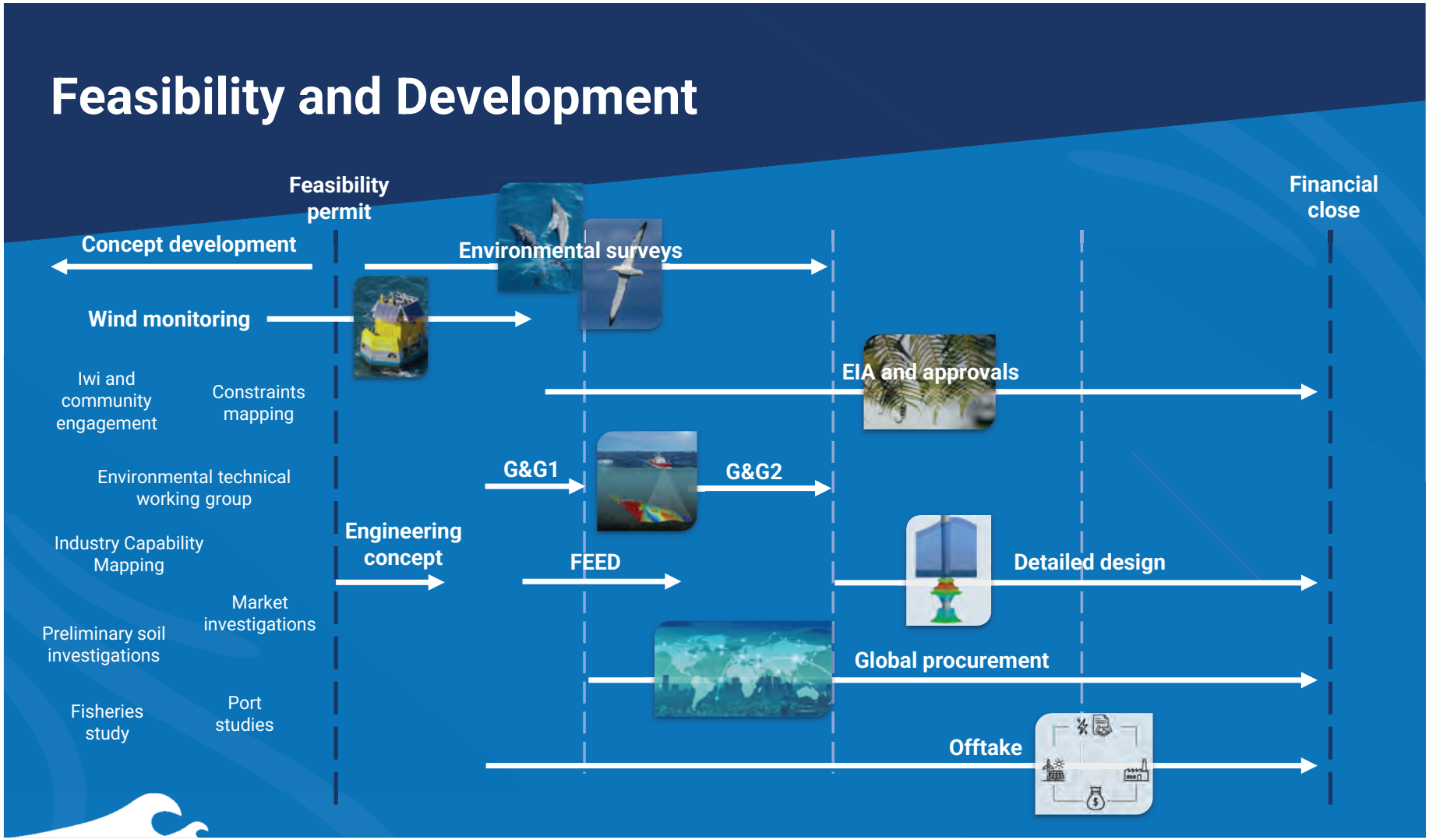
Up to 70 fixed offshore wind turbines

Up to 1GW installed capacity in the first stage
(option of a second stage for a total capacity of 2GW)

Predicted capacity factors of 50-55%

TARANAKI
OFFSHORE PARTNERSHIP
BY
NZ SUPER FUND & COPENHAGEN INFRASTRUCTURE PARTNERS

Feasibility and Development



TARANAKI OFFSHORE PARTNERSHIP
BY
NZ SUPER FUND & COPENHAGEN INFRASTRUCTURE PARTNERS

Activities 2021-23

Desktop fisheries study

Environmental constraints mapping

Environmental technical working group

Iwi and community engagement

Taranaki Rescue Helicopter and WOMAD sponsorships

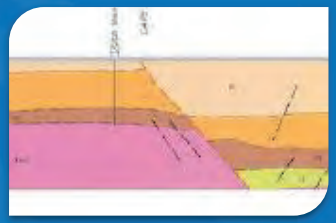
Opened Hāwera office, holding community presentations

Port Taranaki construction port study

Pātea harbour study

Industry Capability Mapping phase 1

National Impacts Study



Seismic code review

Desktop geotechnical study

Engaging with MBIE on regulations

Government & stakeholder event

Floating LiDAR wind measurement

Fixed LiDAR

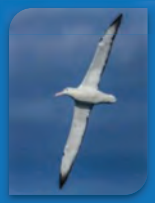
Desktop wind potential assessment

TARANAKI OFFSHORE PARTNERSHIP
BY
NZ SUPER FUND & COPENHAGEN INFRASTRUCTURE PARTNERS

Planned activities 2024

Supporting Wild for Taranaki studies

Marine mammals experts Forum



Avifauna risk assessment

Hydrogen / Power-to-X study

Electricity market modelling

Marine mammals acoustic monitoring pilot study

Initial carbon impact assessment / LCA

Taranaki Rescue Helicopter and WOMAD sponsorships

Iwi and community engagement

Hāwera office, holding community presentations

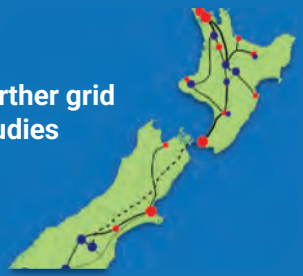
Floating LiDAR wind measurement

Fixed LiDAR

Industry Capability Mapping phase 2

Further construction + operations & maintenance port studies

Further grid studies



Engaging with MBIE on regulations

TARANAKI OFFSHORE PARTNERSHIP
BY
NZ SUPER FUND & COPENHAGEN INFRASTRUCTURE PARTNERS

Thank You

For further information:

taranakioffshorewind.co.nz

gca@cop.dk

TARANAKI
OFFSHORE PARTNERSHIP
BY
NZ SUPER FUND & COPENHAGEN INFRASTRUCTURE PARTNERS

Dr Pat O'Meara

CEO, Wind Quarry Zealandia

Wind Quarry Zealandia

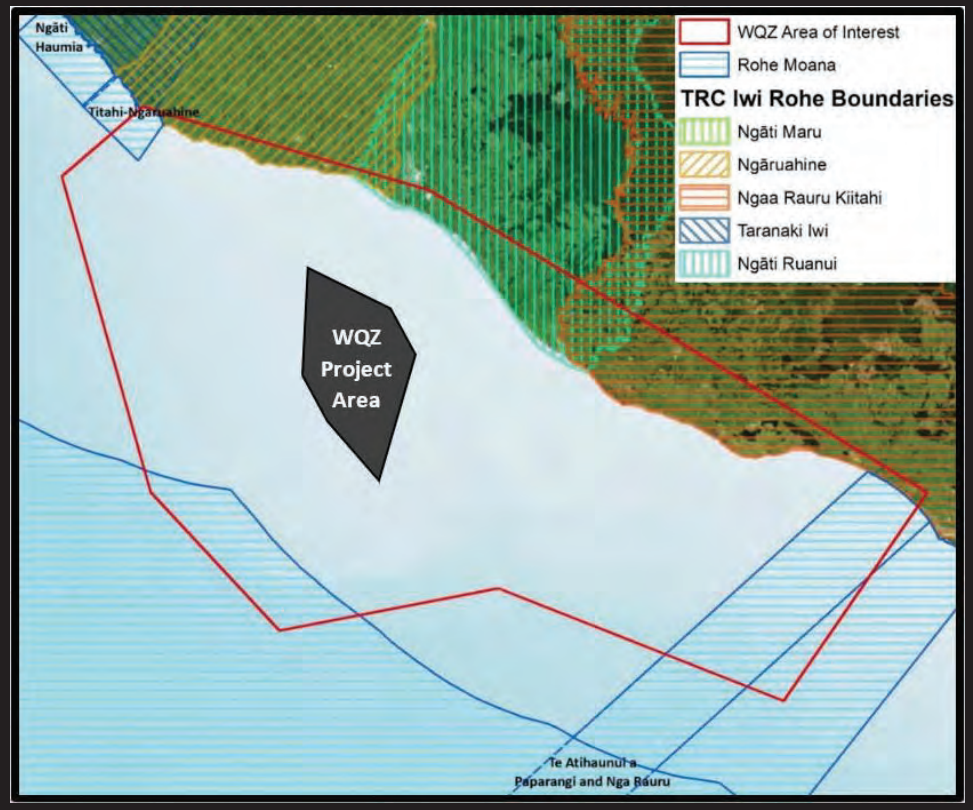
Update for the 2024 Offshore Renewable Energy Forum

Clean Energy for a Changing World®

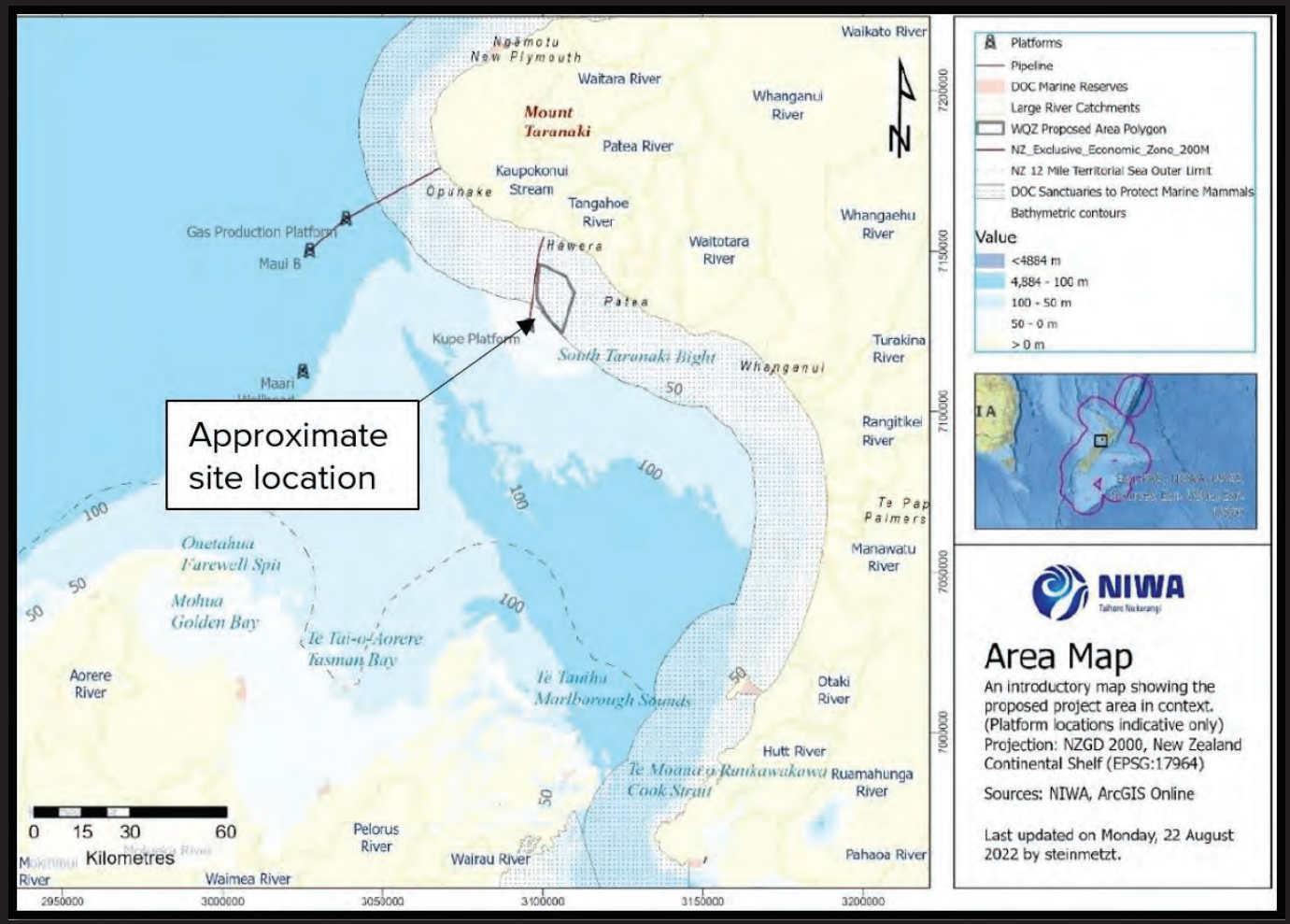

Wind Quarry
Zealandia LTD
March 2023
421 ppm
March 2024
425 ppm
“We can’t solve problems with the same kind of thinking we used to create them.”
-Albert Einstein
Clean Energy for a Changing World®

Iwi Partnerships

- Iwi discussions since 2020
- True partnerships
- Material returns
  - Skilled jobs
  - Business development
  - Community benefit payments
- Investment and governance opportunities

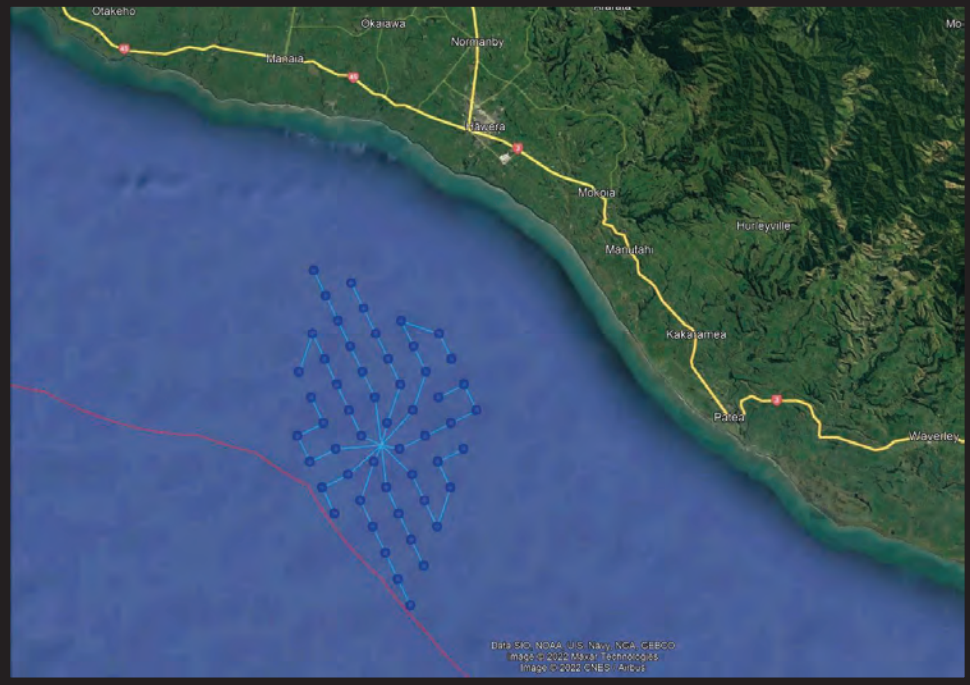


The Project Location



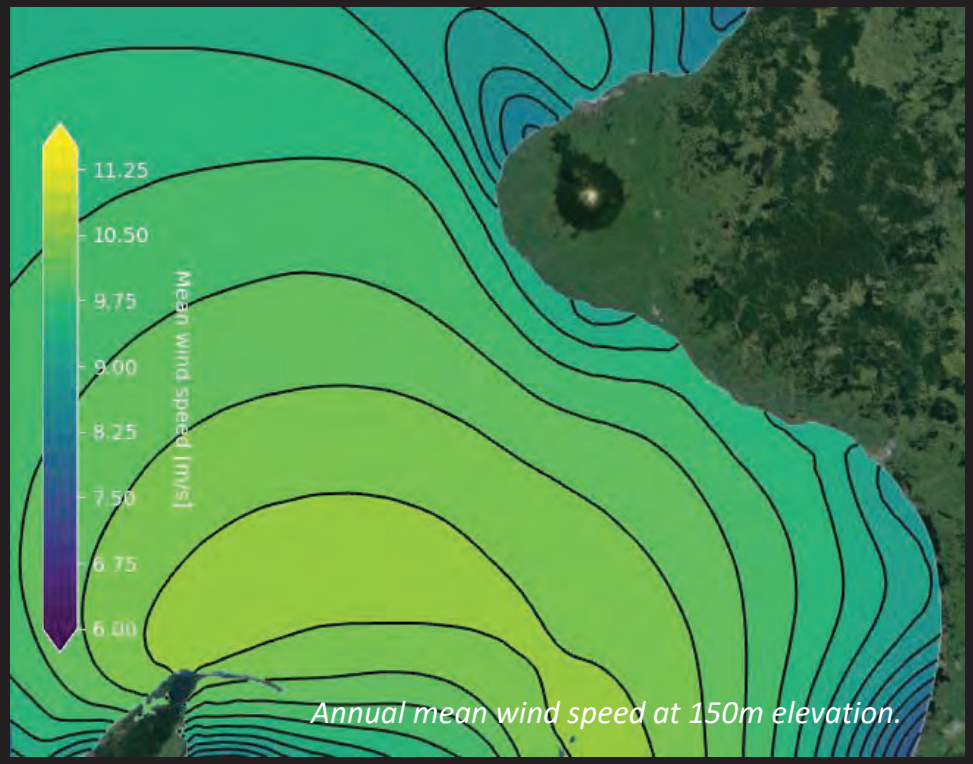
The Project

- 54 x 15 MW turbines = 810MW
- Monopile foundations
- Turbines approx. 1.9 km apart
- 5-12 nautical miles offshore
- An offshore substation



Site Selection Criteria

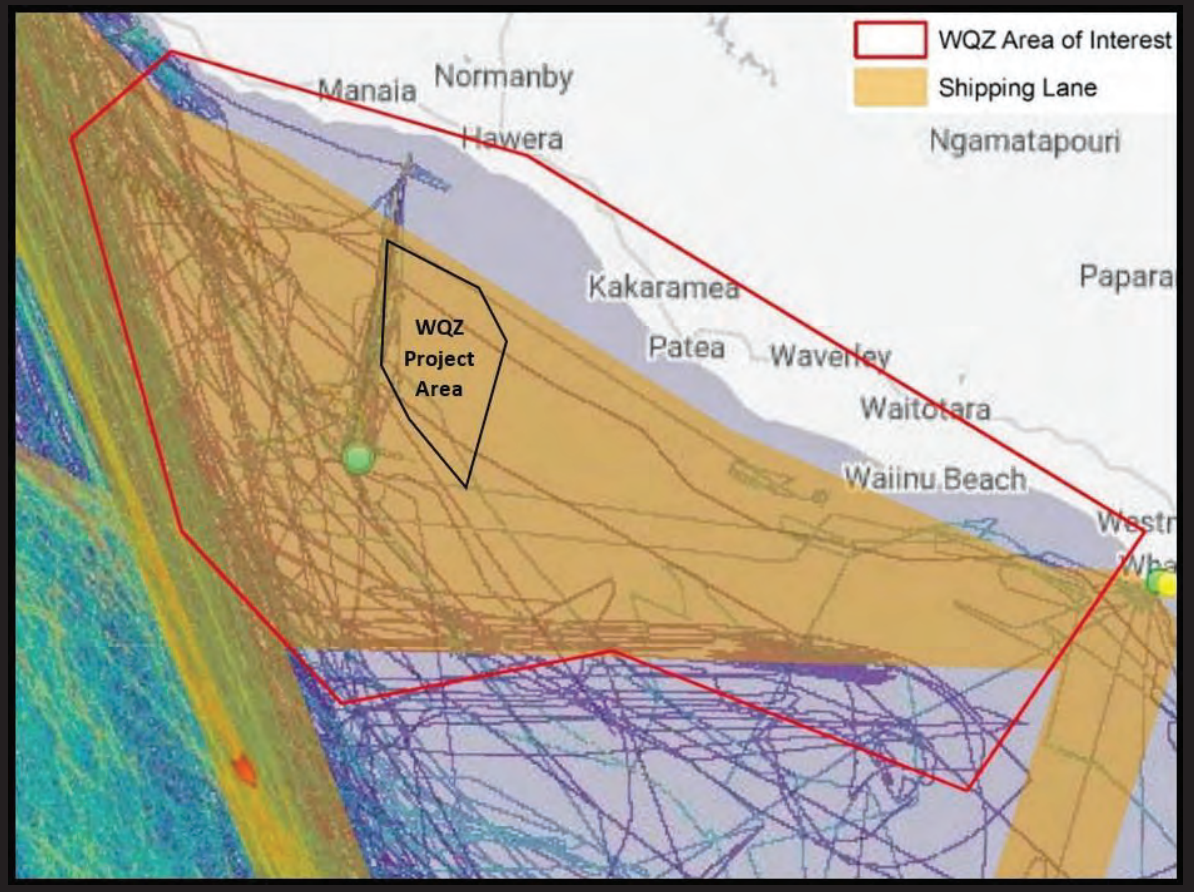
- Quality of wind
- Seabed characteristics
- Access to ports
- Biodiversity impacts
- Access to onshore infrastructure
- Water depth



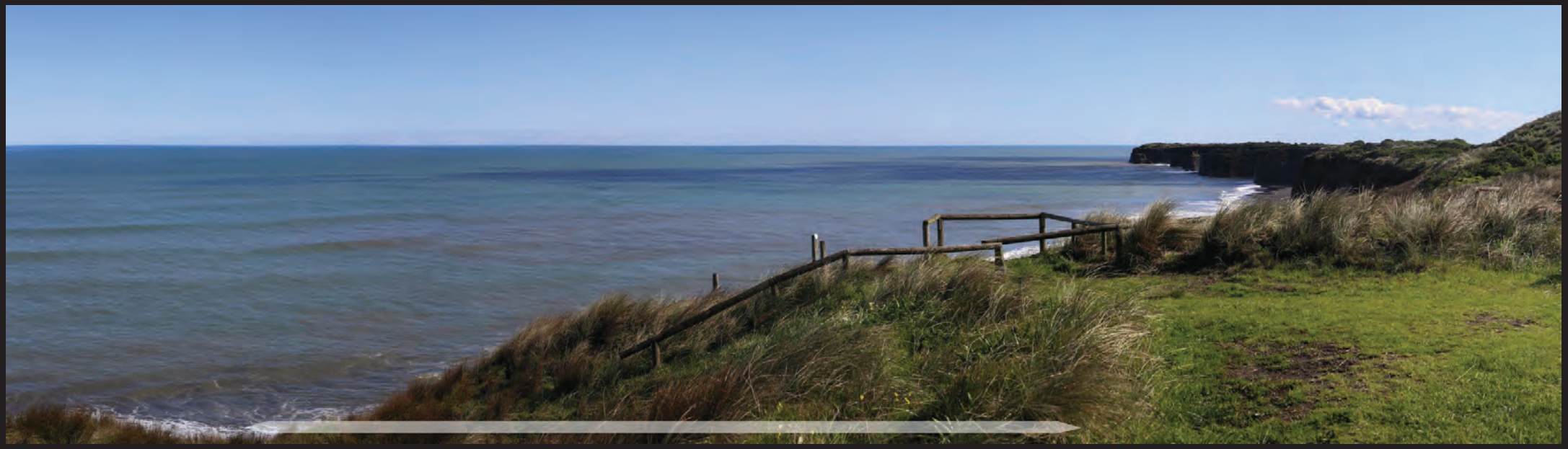
Annual mean wind speed at 150m elevation.

Site Selection Criteria

- Shipping impacts
- Recreational impacts
- Fishing impacts
- Visual impact



The Project from the Patea Beach Lookout



Resource Consent Application

Lodged with the Taranaki Regional Council in August 2023

- Filed under Resource Management Act 1991
- Assessment of Environmental Effects submitted
- Cultural Impact Assessment
- Adaptive Management Plan

Clean Energy for a Changing World®

Shiraji Kosuke

Assistant Manager of Renewable Energy Team No.2
Sumitomo Corporation

Introduction of Sumitomo Corporation

March 2024

Sumitomo Corporation | Enriching lives and the world

01

About Us

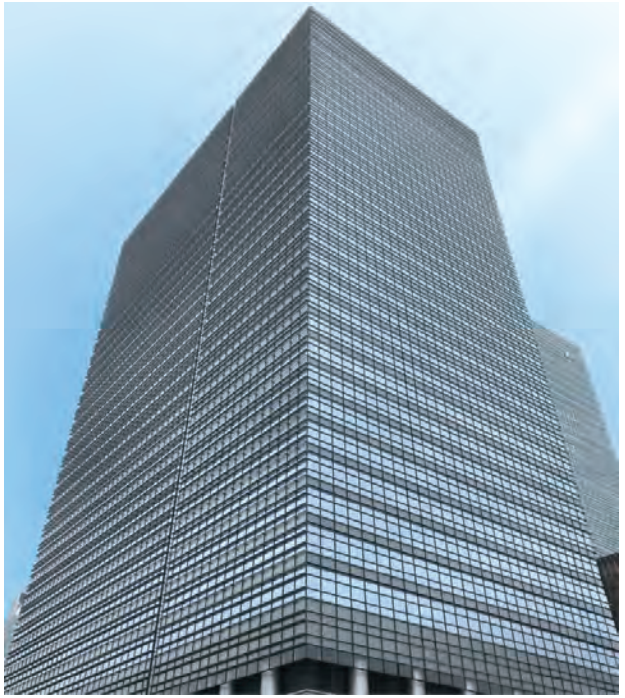
Corporate Profile

as of Sep 30, 2023

Company Name	SUMITOMO CORPORATION
Establishment Date	December 24, 1919
Representative	Masayuki Hyodo Representative Director, President and Chief Executive Officer
Total Asset	NZ$ 117 billion
Number of Offices	128 locations (Japan: 20, Overseas: 108) in 65 countries and regions
Head Office	Tokyo, Japan
Number of Employees	5,196＊（Consolidated Base: 79,513） ＊Including the 135 persons whom overseas branches and offices of the Company employ
Number of Consolidated Subsidiaries and Associated Companies	Consolidated subsidiaries: 649（Japan: 142, Overseas: 507） Affiliated companies: 251 (Japan: 50, Overseas: 201）

Total Assets
NZ$117 bil

Net Income (FY2022)
NZ$ 7 bil



Business Activities

Sumitomo Corporation Group conducts business activities in a wide range of industries on a global scale, with its 6 business units, an initiative, and regional organizations all over the world working closely together.

- Metal Products Business Unit
- Transportation & Construction Systems Business Unit
- **Infrastructure Business Unit**
- Media & Digital Business Unit
- Living Related & Real Estate Business Unit
- Mineral Resources, Energy, Chemical & Electronics Business Unit
- Energy Innovation Initiative

Number of Offices

128 locations

65 countries and regions

Number of Group Companies & Employees

900 companies

79,513 Employees

as of Sep 2023

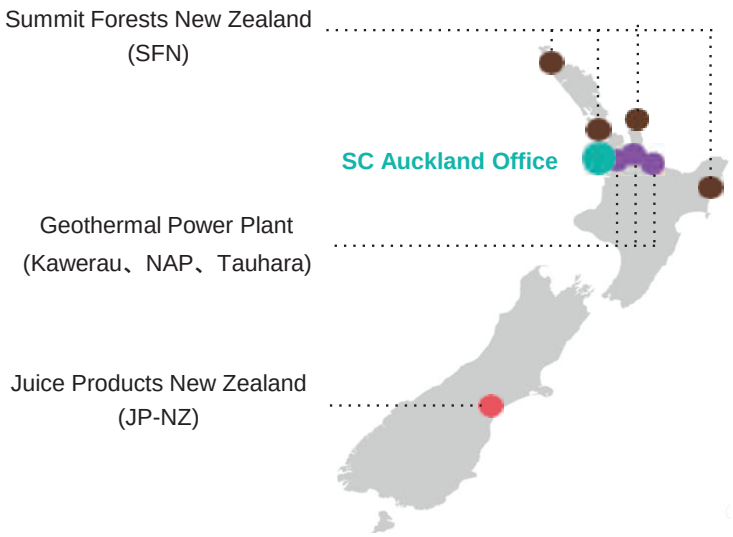
About Sumitomo Corporation

Business Activities in New Zealand

Sumitomo Australia Pty Ltd. Auckland Office

Since 1963, Sumitomo Corporation maintains its office in New Zealand.

- Expats: 3 persons (incl. the expats to JPNZ and SFN)
- Address: Level 10, 57 Fort Street, Auckland 1010
- Phone: +64-9-915-5870



Investment

- **Juice Products New Zealand (JPNZ)**

✓ Frozen carrot juice manufacturing/exporting business mainly for Kagome

- **Summit Forests New Zealand (SFN)**

✓ Planting, Forest management, log sales for domestic & export market

✓ Over 50,000ha forest assets in NZ
- Purchased 25,000ha in Northland in Mar. 2013
- Additional acquisition 13,000ha in Northland in Nov. 2021

EPC

- **Geothermal Power Plant**

✓ **For Mercury Energy (Partner: Fuji Electric)**
Kawerau : 100MW
Nga Awa Purua (NAP) : 140MW

✓ **For Contact Energy (Partner: Fuji Electric, Naylor Love)**
Tauhara : 175MW (Under Construction)

*Tauhara power station will be the largest single-unit geothermal power station in the world.

NAP Geothermal power plant

Sumitomo Corporation | Enriching lives and the world

Renewable IPP Portfolio

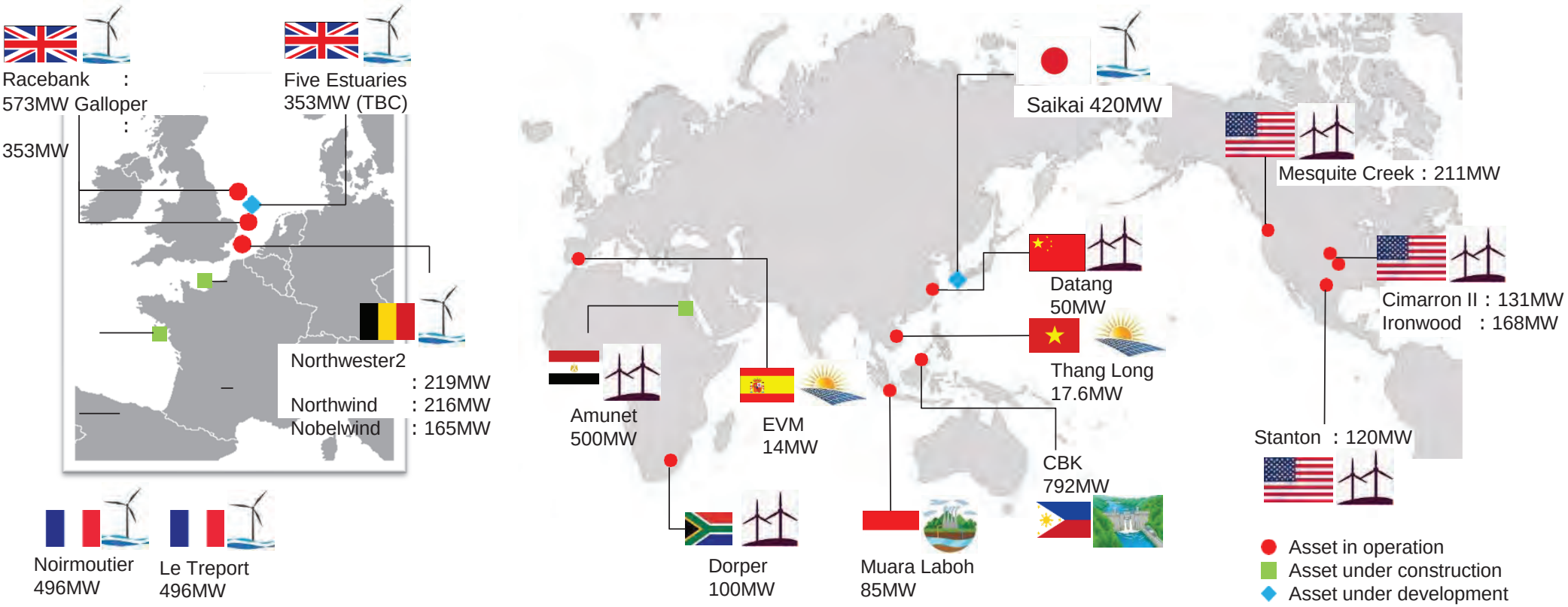
(*) Independent Power Producer

Gross Capacity	6GW

Net ownership Capacity	2GW

Offshore wind　Onshore wind　Solar

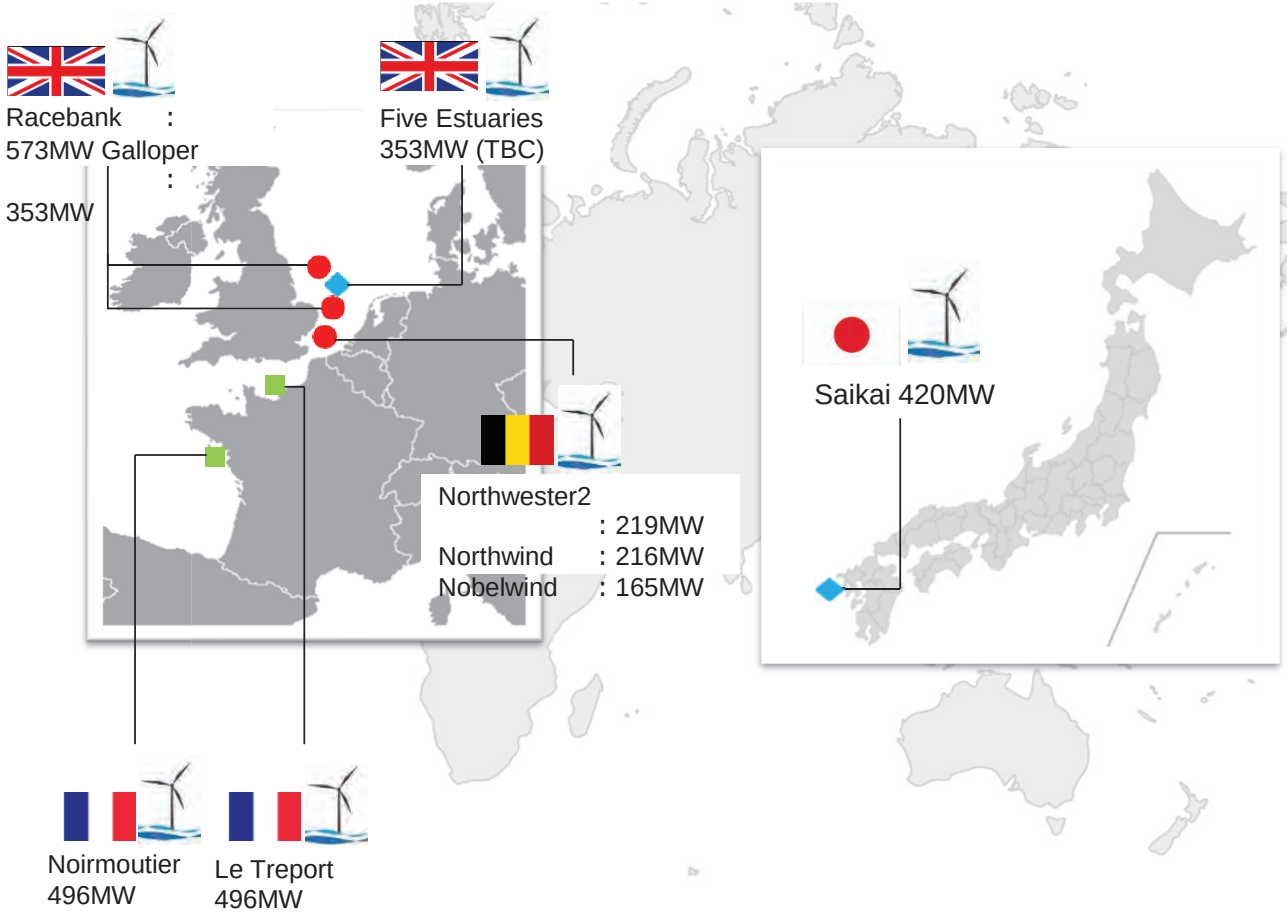
Hydro　Geothermal



Offshore Wind: 3,291MW, Onshore Wind: 1,668MW, Solar: 186MW, Hydro: 792MW, Geothermal:85MW, Biomass: 112MW

Offshore Wind IPP Portfolio

- Asset in operation
- Asset under construction
- Asset under development



Japan's Project Overview	
Total project cost	NZD 3.9bil (approx.)
Power generation facility output	420MW (V236-15MW x 28 units)
Business location	General sea area off Enoshima, Saikai City, Nagasaki Prefecture
Construction base port	Kitakyushu Port
Maintenance base port	Saikai city
Consortium member	• Sumitomo Corporation (representative) • TEPCO Renewable Power, Inc.
COD	August 2029 (planned)

Sumitomo’s Business Philosophy

Sumitomo's Business Philosophy has been refined through many generations based on the Founder's Precepts "Monjuin Shiigaki," which Masatomo Sumitomo (1585-1652), the founder of the Sumitomo family, wrote and handed on to describe how a merchant should conduct business. The basic points of Sumitomo's Business Philosophy have been passed on in the form of the two articles of the Business Principles.

Business Principles

Article 1. Sumitomo shall achieve strength and prosperity by placing prime importance on **integrity** and **sound management** in the conduct of its business.

Article 2. Sumitomo shall manage its activities with foresight and flexibility in order to cope effectively with the changing times. **Under no circumstances, however, shall it pursue easy gains or act imprudently.**

Other credos contained in Sumitomo's Business Philosophy :

自利利他公私一如

“Benefit for self and others, private and public interests are one and the same.”

企画の遠大性

*“Farsighted Planning.” This derives from copper mine management in its early days which required **long-term vision** and **continuous effort**.*

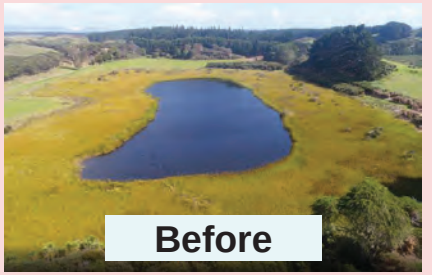
Local Contributions by Summit Forests NZ

Project Kiwi in Whangapoua Forest in the Coromandel

- Engaged by Summit, Project Kiwi manages **a predator control programme (trap network)** within Whangapoua Forest in an area called the Biodiversity Block. There are 193 traps in the Biodiversity Block; these are checked and serviced 24 times a year. A survey indicates that the management programme is having a positive effect on the population of Coromandel brown kiwi.

- In June 2023, Project Kiwi and Summit Forests released **the 100th kiwi** into the Whangapoua Forest.

Restoration of Little Gem Lake



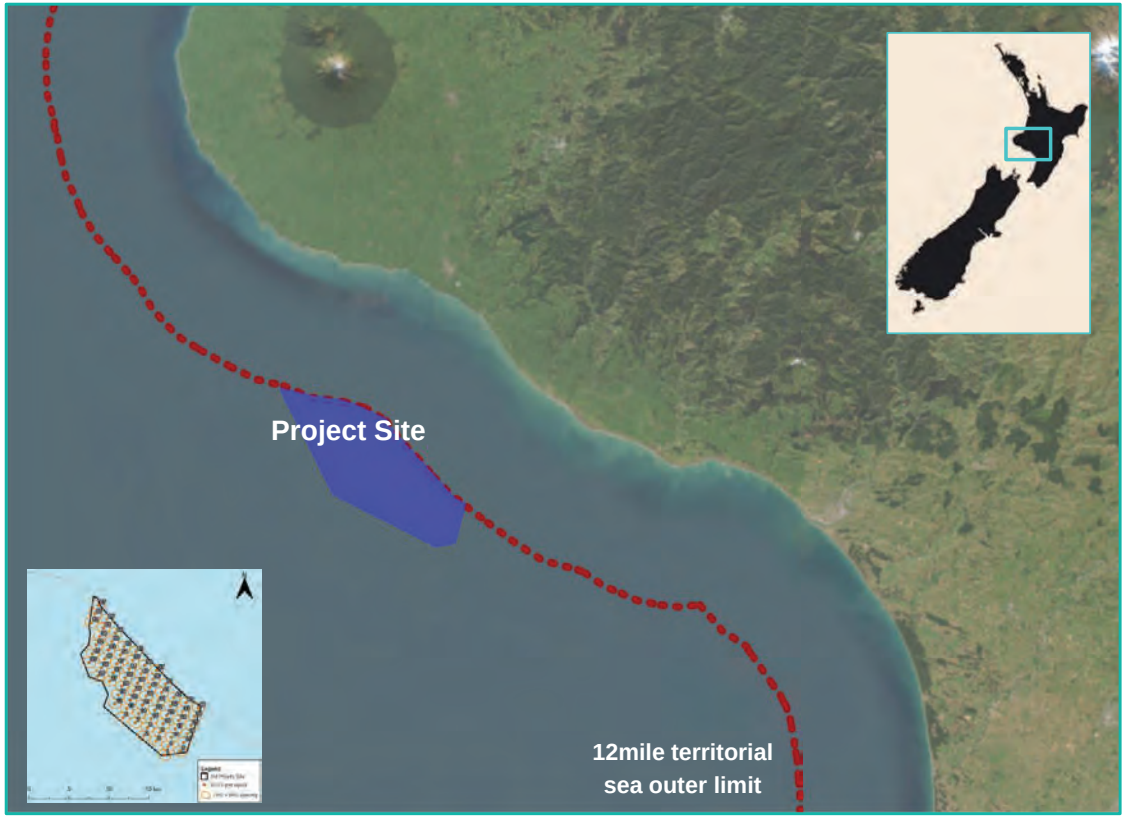
02

Offshore Wind Project in New Zealand

Offshore Wind Project in New Zealand

Project Overview

Overview (*)	
Generation Capacity	1,000 MW (approx.)
WTG size	15 - 20MW (TBC)
Location	South Taranaki Bight (EEZ)
Water depth	30 - 50m
Foundation	Monopile
Mean wind speed	10 - 11m/s (approx.)
Expected COD	2032 - 2033



(*) This overview could be changed subject to future's events and further studies.

Our Activities

- Response to 1st / 2nd Discussion Document
- Pre-Feasibility Study (Pre-F/S) for site selection
- Start of offshore wind monitoring with LiDAR
- Concept Assessment for grid connection
- Environmental study (desk-top)
- Data Collection of Geotechnical / Metocean Conditions etc.
- National Impact Study (in collaborative way)

Hon Dr. Megan Woods, MBIE, and business delegations visiting at Sumitomo HQ

Our Team

Summit Renewable Power (“SRP”) (*)

Dusseldorf (Germany)


Mr. Christoph Mertens


Mr. Jörg Philp


Ms. Reiko Kawarazaki


Mr. Wolfgang Krueger


Mr. Michael Paucke


Mr. Felix Prechtel


Mr. Paulo Pereira


Mr. Christian Voelcker


Mr. Bernd Horstmann


Ms. Andrea Glückstadt


Ms. Heike Deussen


Ms. Anne-Marie Brach


Mr. Kenta Nishikawa


Mr. Shuhei Abe

London (UK)


Mr. Ken Kageyama


Mr. Nicholas Nunn


Mr. Shinsaku Yagi

Paris (France)


Mr. Geert Dewaele


Ms. Lene Thomsen


Mr. Richard Martin Tunney


Mr. Yutaro Takeuchi


Mr. Jens Hansen


Ms. Megu Takagawa


Mr. Koichiro Tashiro


Ms. Haruki Hatakeyama

(*) Established in 2016 as a COE (Center of Excellence) specializing in development and asset management of offshore wind projects

Sumitomo Corporation in Japan

Renewable Energy Team No.2


Mr. Takashi Aota


Mr. Meguru Nishiyama


Mr. Kosuke Shiraji


Mr. Takumi Miyakoshi


Ms. Rin Arakawa

Sumitomo Australia Pty Ltd

Perth (Australia)


Mr. Takashi Nose

Auckland (New Zealand)


Mr. Mcleod Sean

Enriching lives and the world


venture
TARANAKI
Te Puna Umanga
Ara
Ake
Future
Energy
Development
Rémi Gruet
CEO, Ocean Energy Europe

Ocean Energy Europe

oceanenergy.eu

Ocean Energy – Acceleration & opportunities

Rémi Gruet, CEO, Ocean Energy Europe

Ocean Energy Europe

- 120 members
- Lead partners:


Tidal – Revenue support in
2 main markets
ORBITAL 02
02
ORBITAL 02
UK CfD AR4 - AR5 - AR6
Orbital – SAE Renewables – Magallanes – Verdant – QED/Hydrowing


Tidal – Revenue support in
2 main markets
France – Grant + FiT - Tidal commercial tenders announced,


Tidal – “Off-grid” markets realising
Faroe Islands, Minesto, PPA with local utility SEV

OEE2024, Scotland, Aviemore (near Inverness)

Wave for mainstream grid
Prototyping continues + first farms seeking finance

CorPower Ocean – Portugal & Ireland


Wave & wind – appetite from officials and industry
Floating Power Plant – Spain

Wave alternative markets – Decarbonising, ocean monitoring – ENI, Italy

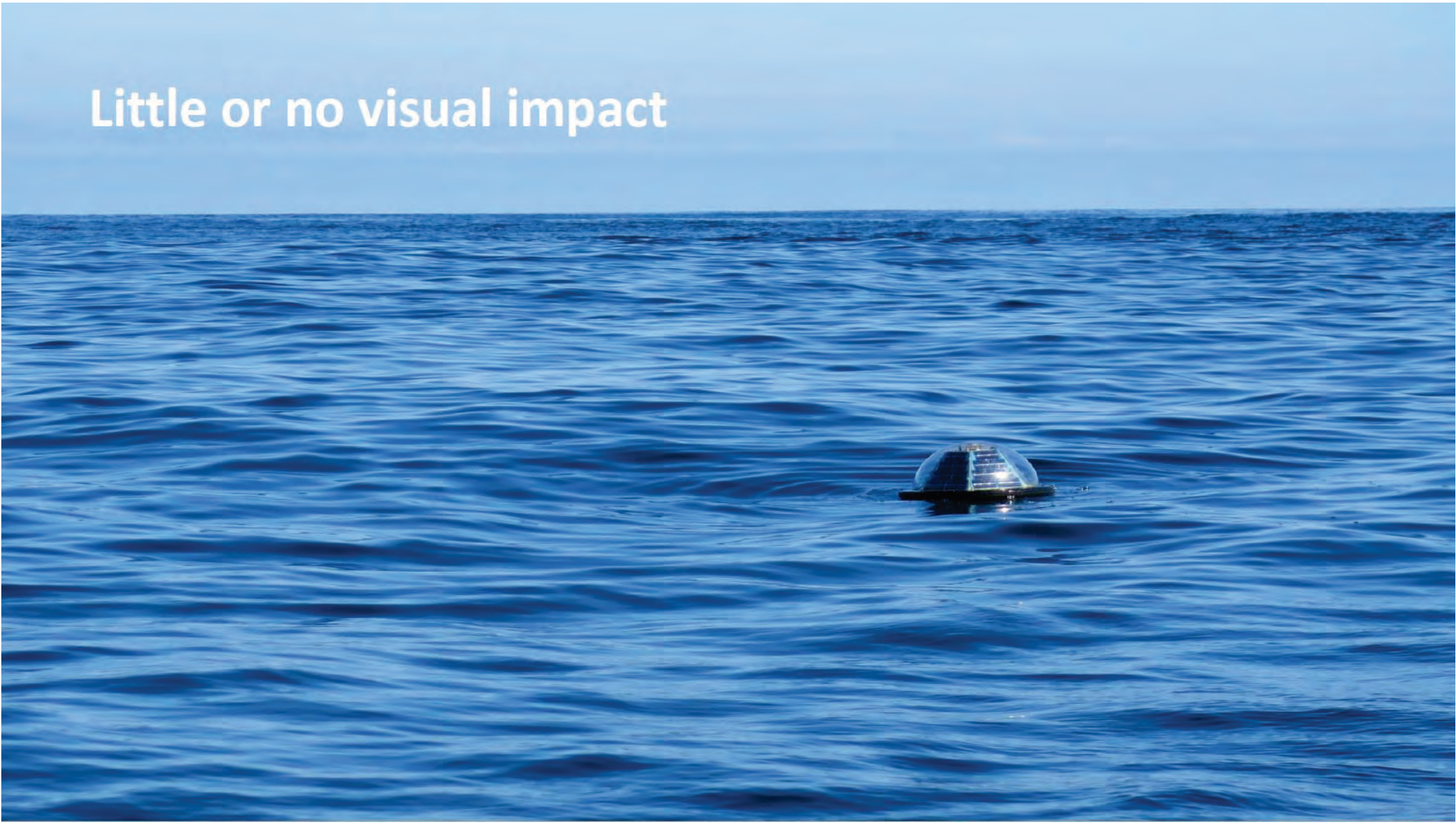
Interest from power utilities or oil& gas majors?

- ESB-i + CorPower Ocean
  - => Saoirse, Ireland
- ENGIE/Laborelec + Orbital
  - => EURO-TIDES, Scotland
- QAIR + HydroQuest
  - => Flowatt, Normandie, France
- SEV + Minesto
  - => Faroe Islands
- Total Energies + CorPower Ocean
  - => Pilot Access Programme
- Shell + ORPC/Mocean/Wavepiston
  - => various locations
- Equinor + Havkraft
  - => feasibility study on wave energy to decarbonise offshore operations
- Total Energies + Mocean/Verlume
  - => RES for subsea power

ORE Strategy spurring unprecedented EU funding

- EU Offshore Strategy update:
  - 100 MW by 2027, 1 GW by 2030
- Horizon Europe - €93m
  - €40m for tidal arrays
  - €38m for wave arrays
- Innovation Fund 'Mid-Sized Pilots' call:
  - 2 wave projects, €65m total


Very low environmental risks
...Except a new home for some!


Little or no visual impact

Ocean Energy Europe

oceanenergy.eu

Thank you for your attention!

@EuropeanOceanEnergyAssociation

@OceanEnergyEU

european-ocean-energy-association

@oceanenergyeurope