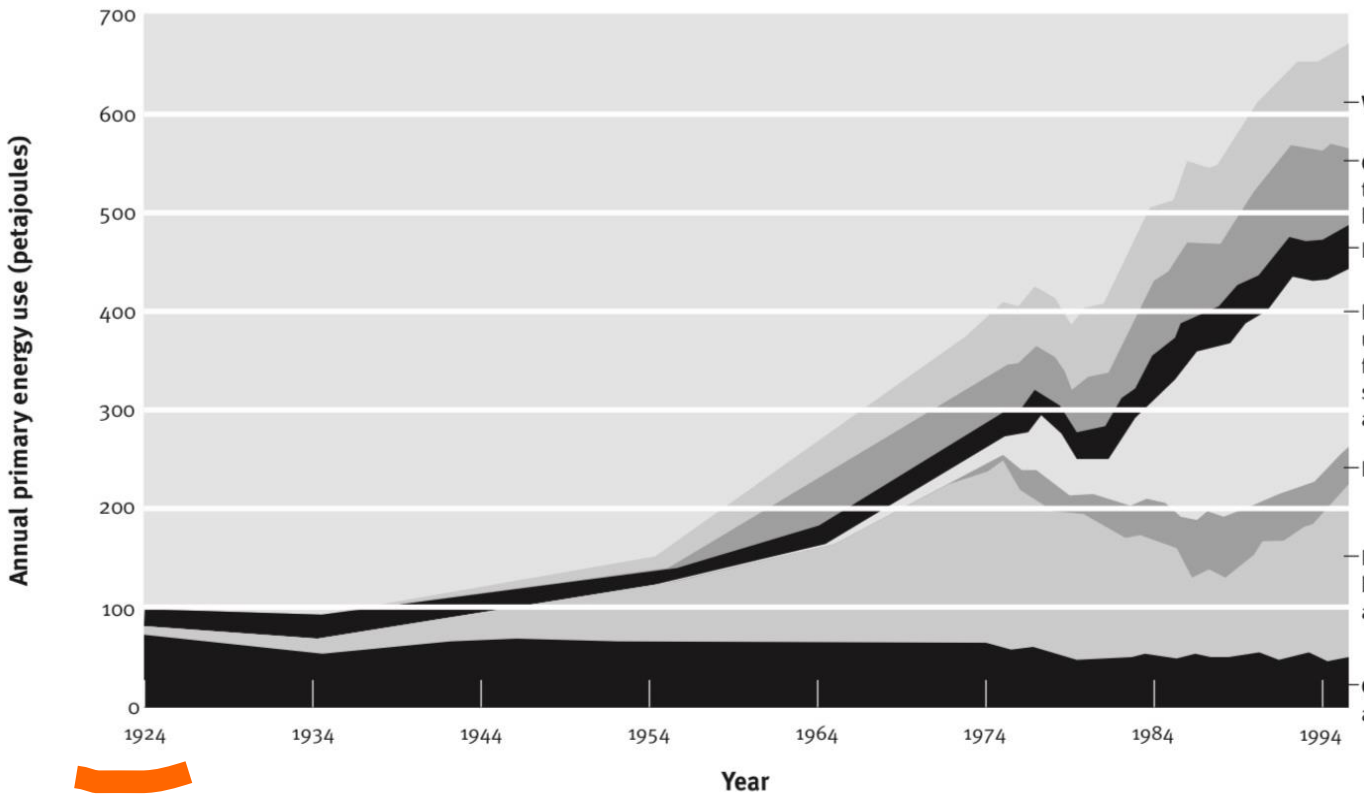
Social Licence?

Ask yourself why you want offshore energy?

- reduce emissions?
- energy security?
- energy affordability?
- creating jobs?
- creating profit?
- fossil fuel alternative?
- engineering feat?
- to be greener than others?
- maintain Business As Usual?

Trends in New Zealand's consumption of primary energy[1,2].



Water used to generate electricity.

Geothermal steam and hot water used to generate electricity and for domestic hot water.

Firewood and other renewable fuels[3].

Natural gas (mainly methane, some propane, butane etc.) used for: power station fuel (27%); fuels (CNG and LPG) for industry boilers, home heating and transport (21%); synthetic petrol (18%); and non-energy producing chemicals and fertilizer (methanol and urea) (34%).

Indigenous oil from wells off Taranaki.

Imported oil and oil products (e.g. petrol, diesel) burnt motor fuel and lubricants for transport and in power stations to generate electricity.

Coal used in thermal power stations, industrial furnaces and home heating.

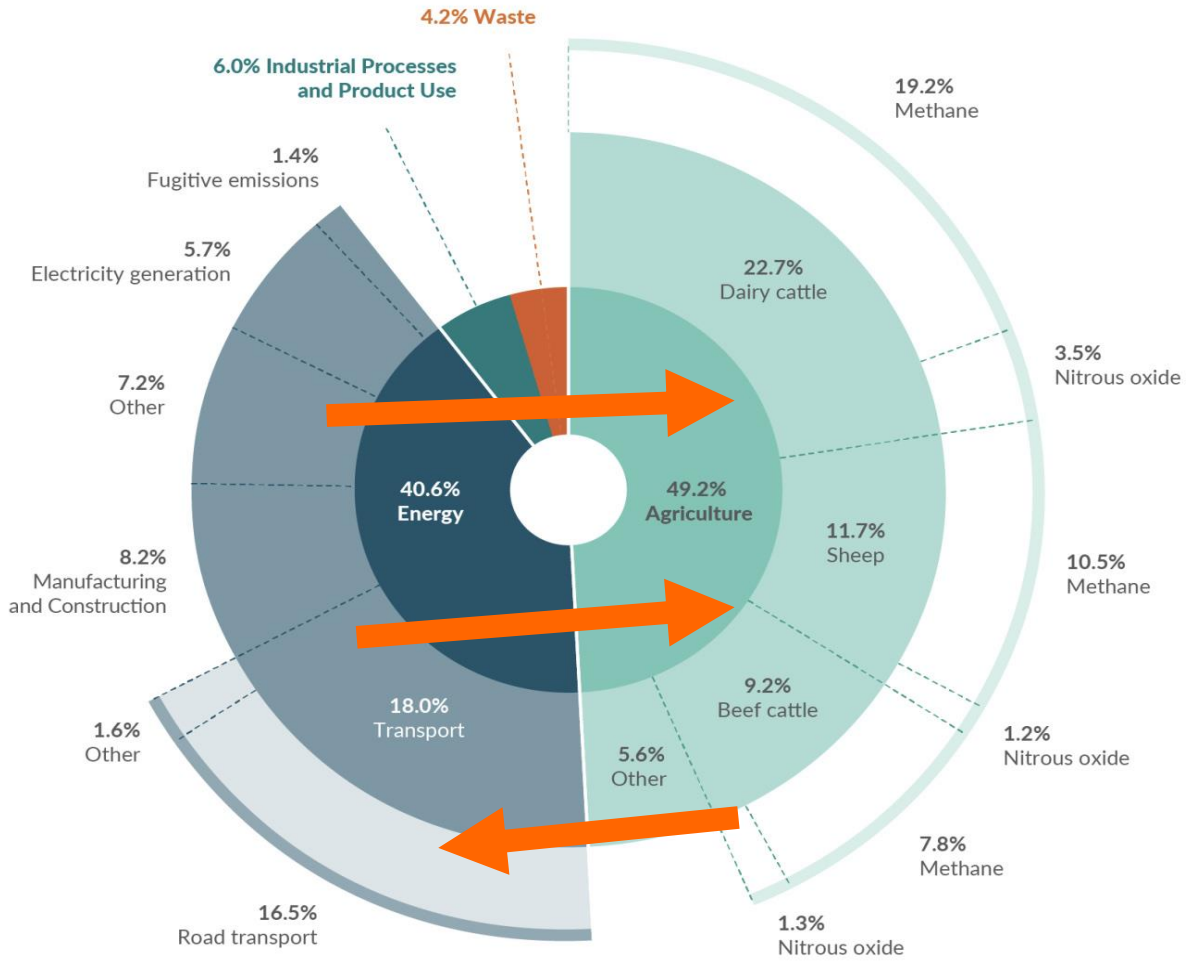
1 Primary energy is the energy content of a resource at the point of extraction or importation. A third of the energy is lost after this point, either as waste heat (e.g. in generating electricity from fossil fuels and geothermal steam) or as non-energy products (e.g. methanol and urea from natural gas). As a result, the amount of energy actually consumed in mechanical movement, useable heat and electricity is considerably less than the amount extracted.

2 Data are decadal 1924-1974, yearly thereafter.

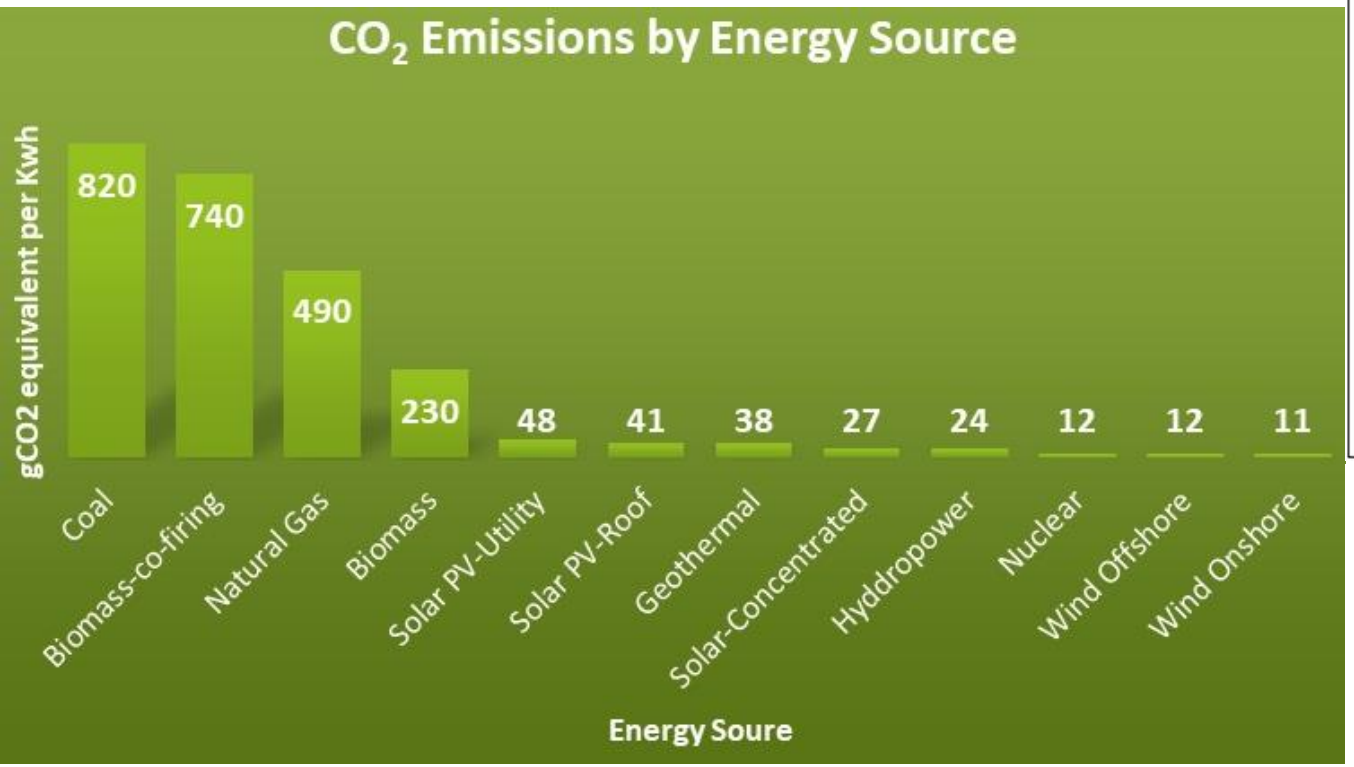
3 'Firewood and other renewable fuels' includes wood, biogas (e.g. methane generated from rotting matter by bacteria) and industrial waste, but not water-based renewables (i.e. geothermal steam and hydro).

Source: Ministry of Commerce

Figure 2: Gross greenhouse gas emissions in 2021 by sector, sub-category and gas type



https://environment.govt.nz/news/new-zealands-gross-greenhouse-gas-emissions-decreased-in-2021/

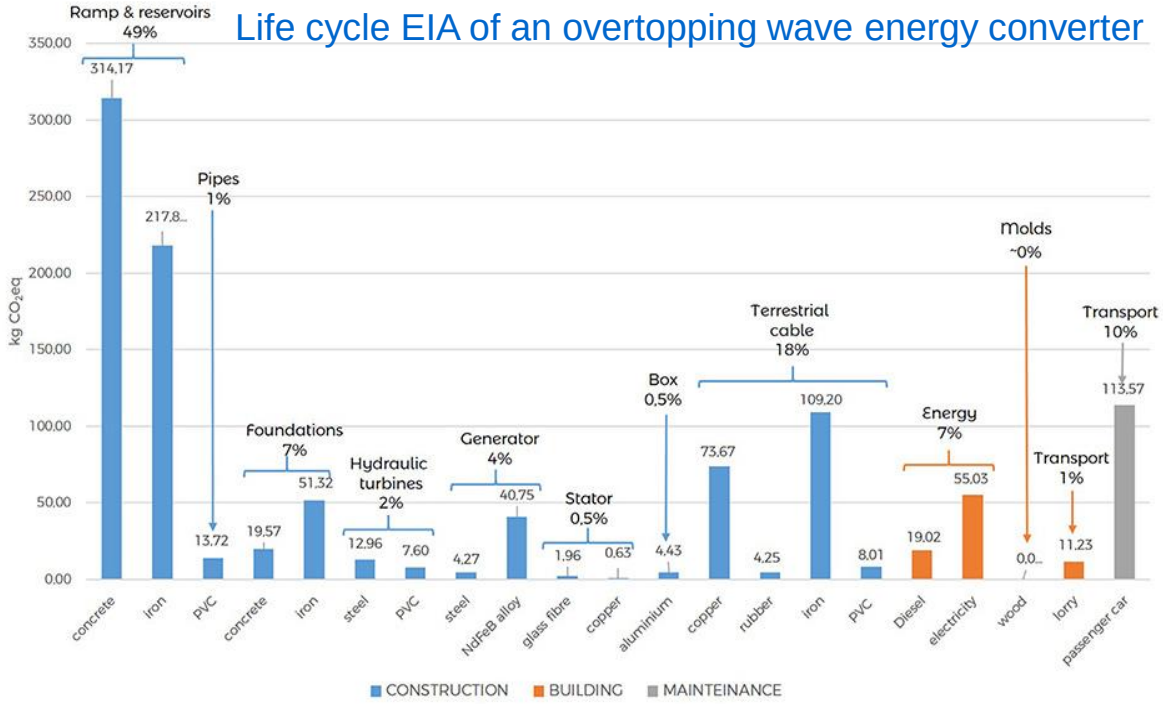


https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_annex-iii.pdf (data source)

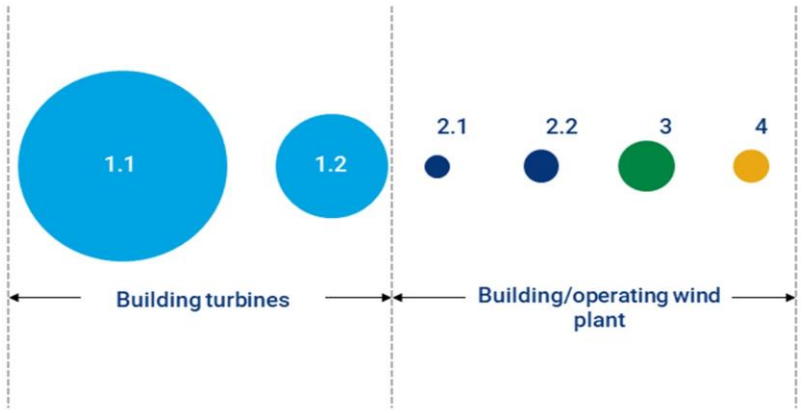
https://www.semanticscholar.org/paper/Lifecycle-Environmental-Impact-Assessment-of-an-in-Patrizi-Pulselli/6fc69e43b343c7ede76f9d831ea36ca03ba63a65

https://www.woodmac.com/news/opinion/can-wind-power-become-truly-carbon-neutral/

Life cycle EIA of an overtopping wave energy converter



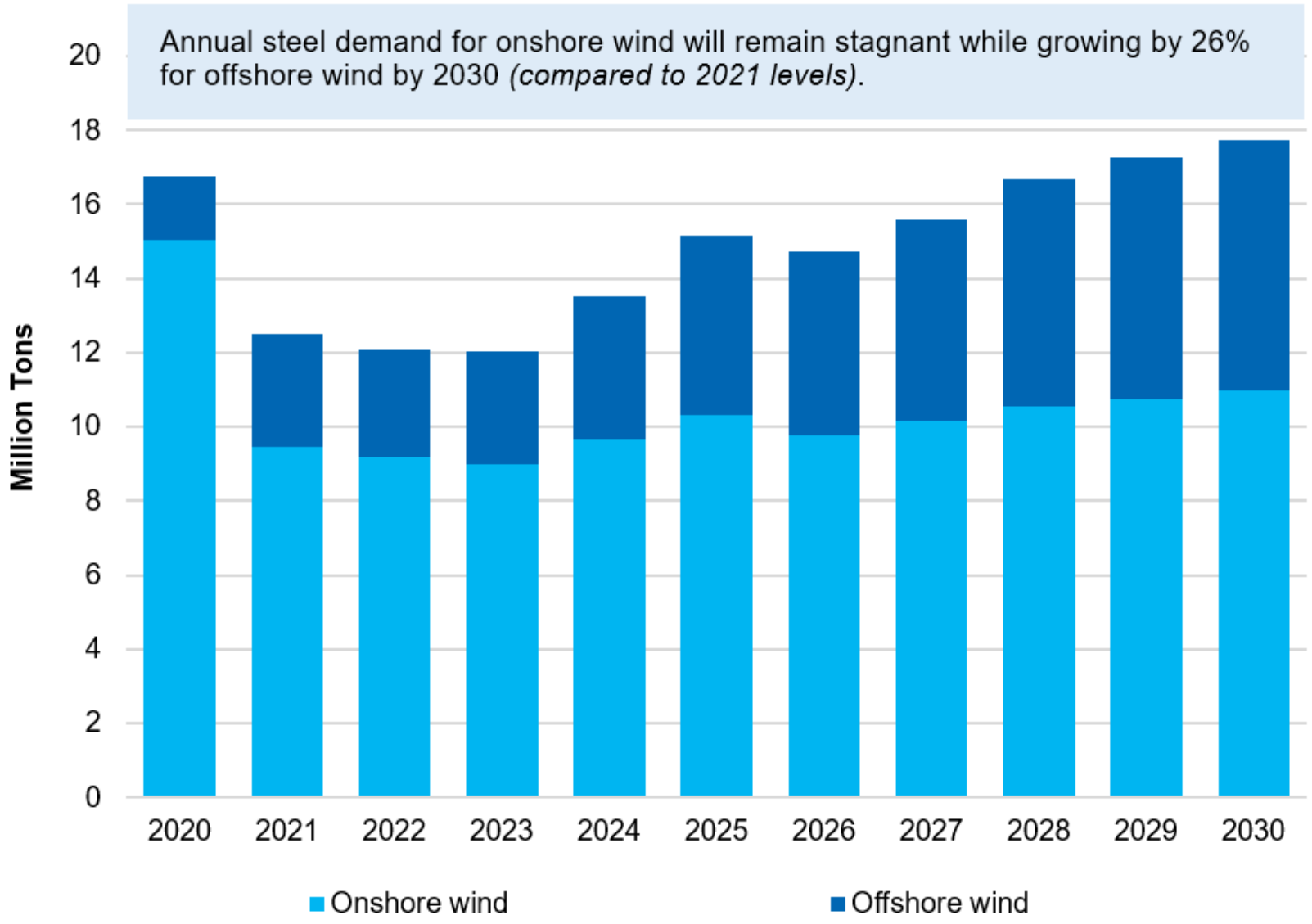
Wind power life cycle carbon emission contributions



	Life cycle
1.1	Raw material extraction
1.2	Manufacturing
2.1	Transportation
2.2	Installation
3	O&M
4	End of life and disposal

Source: Wood Mackenzie. Size of the bubble represents relative carbon emissions in a life cycle stage.

Annual steel consumption by the wind sector by technology, 2020 - 30



Note: Steel consumption by onshore and offshore wind turbines in the future have been estimated. Global blended weighted average steel consumption per turbine has been used to calculate the global steel demand.
Source: IHS Markit

"The global wind industries steel consumption is expected to double this decade reaching 147 MMT between 2021-2030, driven by forecast global additions of 960 GW. Steel is critical for both onshore and offshore wind turbines, making up 20% and 90% of turbine mass for onshore and offshore wind, respectively." S&P Global

https://www.spglobal.com/commodityinsights/en/ci/research-analysis/assessing-the-significance-of-steel-to-the-global-wind-industry.html

Wind power metal intensity (onshore)

Metal (kg/MW)	2022	2030	2040	2050
Copper	2,821	2,513	2,252	2,088
Aluminium	386	379	376	380
Rare earths	39	48	64	86

Source: BloombergNEF

"Nevertheless, the total volume of metals used in the next few decades will increase as the energy transition ushers in more clean power capacity and storage, and this could lead to a supercycle for the metals and mining industry. Copper, aluminum, lithium and steel are the four key metals powering the change." Bloomberg NEF, Feb 2023

Wind power metal intensity (offshore)

Metal	2022	2030	2040	2050
Copper	2,581	3,434	4,045	3,935
Aluminium	127	119	111	107
Rare earths	175	175	180	184

https://about.bnef.com/blog/aluminum-copper-use-to-shrink-in-future-wind-and-solar-farms/

Cumulative Effects

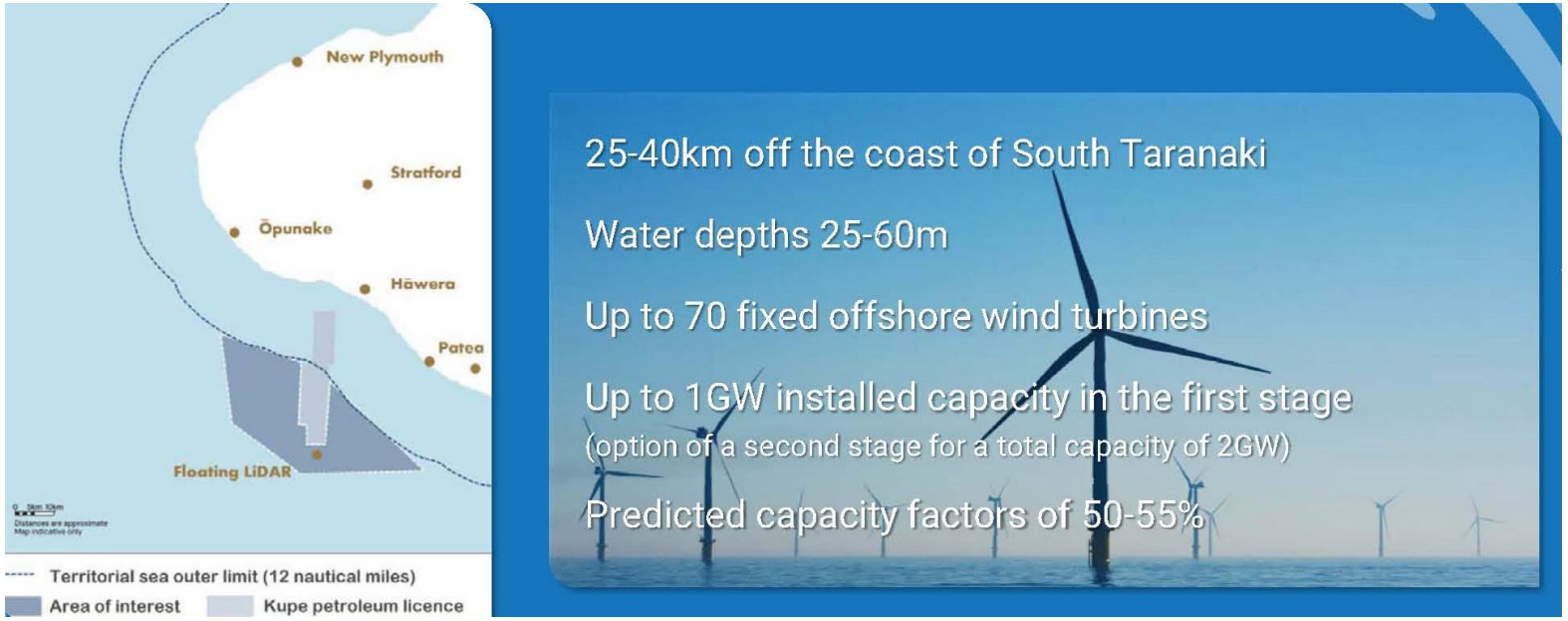
and

Precautionary Principle

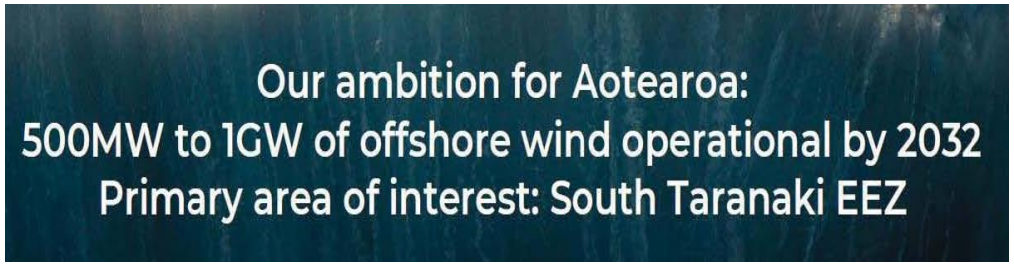
Commercial interest in ‘Saudi Arabia of Wind’?

900MW

Blue Float & Elemental, March 2023



Taranaki Offshore Partnership (NZ Super & CIP), March 2023



Parkwind, March 2023

Taranaki A 1000 MW Floating
Taranaki B 1000 MW Fixed
Waikato 1000 MW Floating

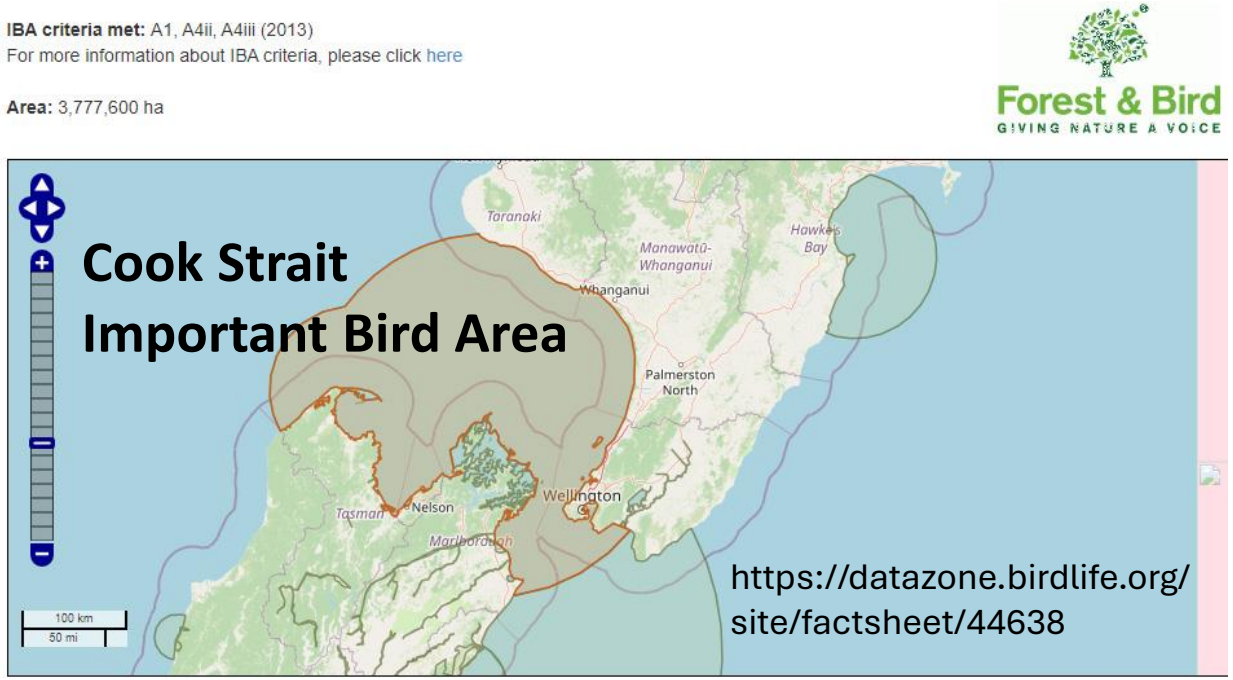
Oceanex NZ, March 2023

And more...

Seabird capital of the world

"At least 145 species of seabirds occur in New Zealand waters. 95 of these species breed here, with more than one third of these breeding species being endemic. New Zealand has the greatest number of resident seabird species and the greatest number of endemic seabird species of any country... More than one third of all seabird species are found in the New Zealand EEZ during their non-breeding periods…" John Cockrem, Oct 23

Statement of evidence re EPA TTR seabed mining reconsideration.

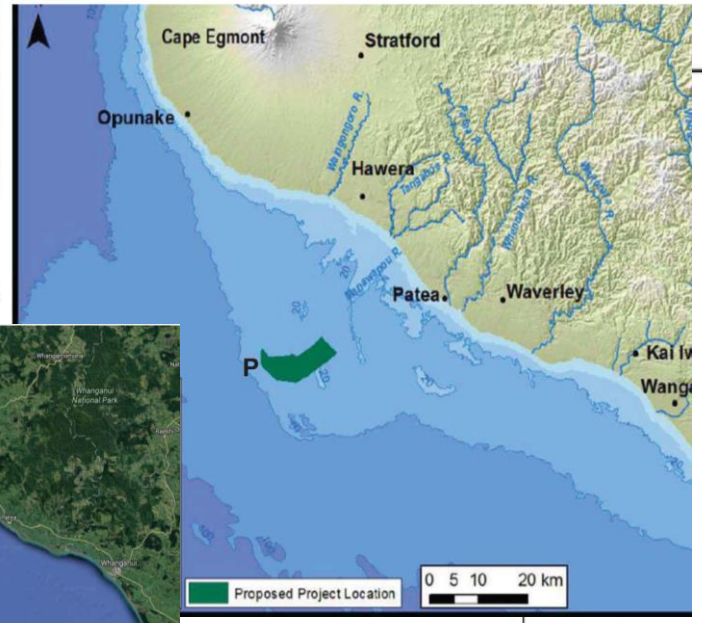


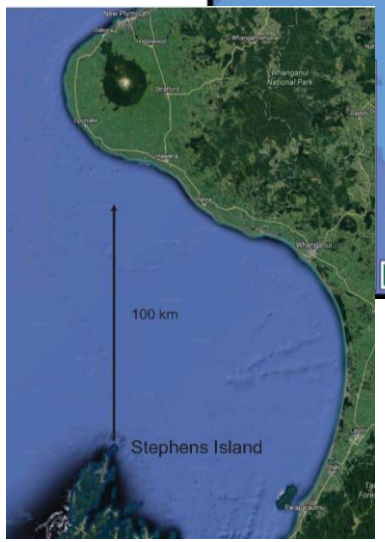
"As Forest & Bird stated in its original submission, the starting point for managing feasibility activities for offshore renewable energy development in the marine environment should be to safeguard marine biodiversity."

Forest and Bird, Aug 2023 (Submission on MBIE Developing a Regulatory Framework for Offshore Renewable Energy Second Discussion Document)

Fairy prion

P =100 000 prions

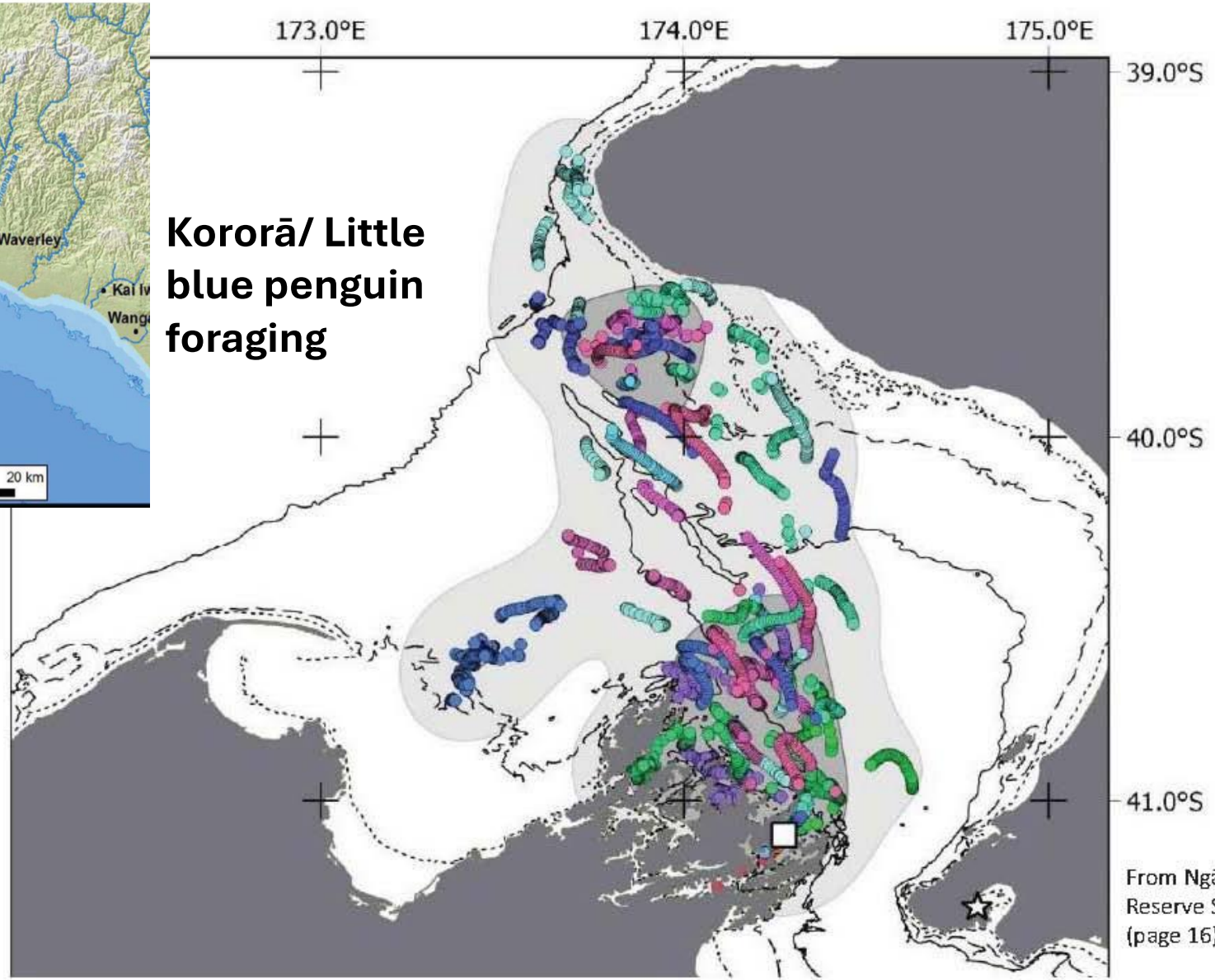




Source: Presentation by expert witness J. Cockrem at EPA TTR seabed mining reconsideration hearing, 15 March 2024

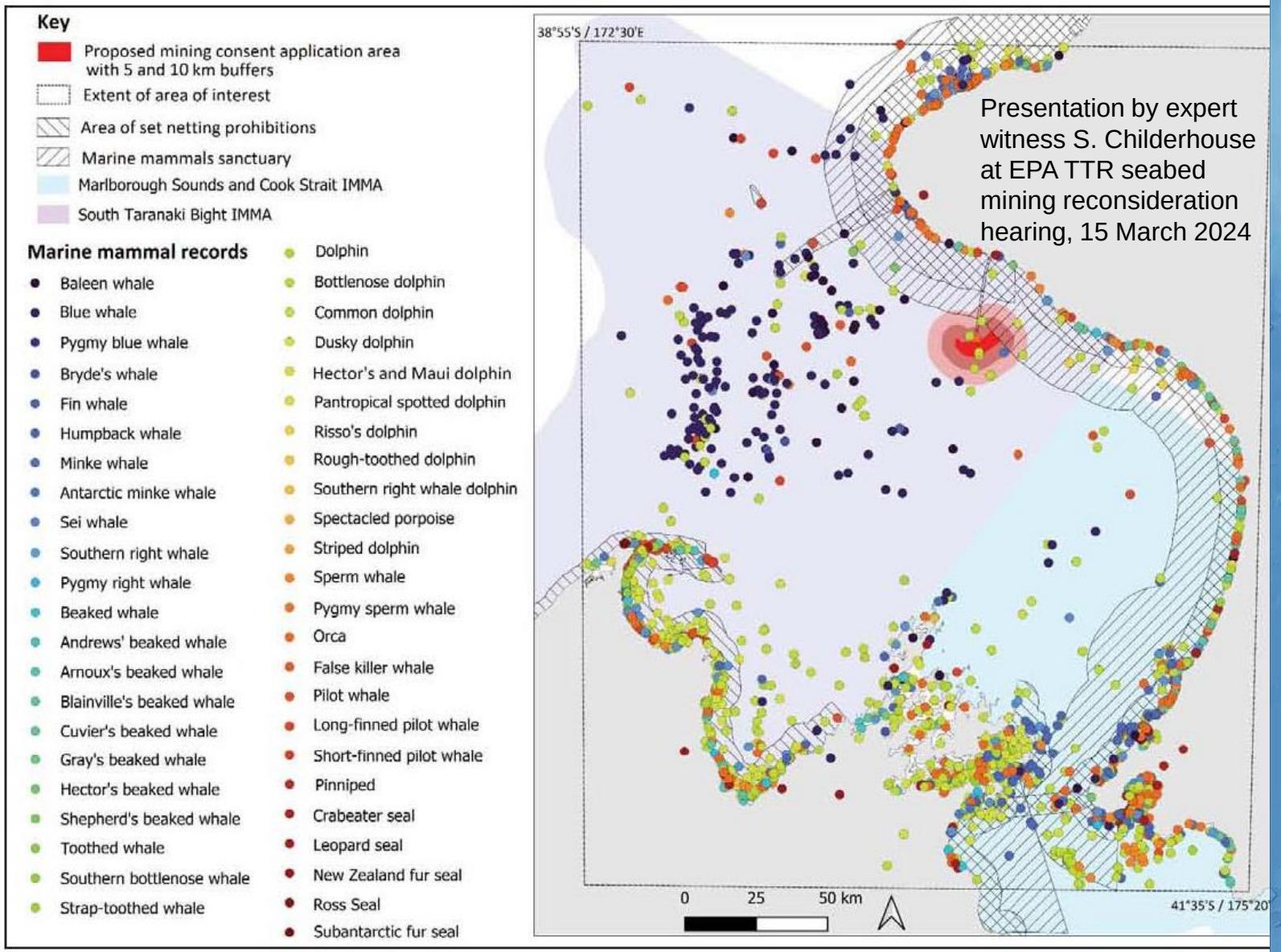
Foraging trips completed by fourteen little blue penguins tagged at Motuara Island, Marlborough, during the incubation period in Spring 2015. Eleven of the fourteen penguins foraged in waters off South Taranaki. These data are Te Papa copyright and summarised in Poupart et al. (accepted for publication in NZ Journal of Zoology).

Kororā/ Little blue penguin foraging

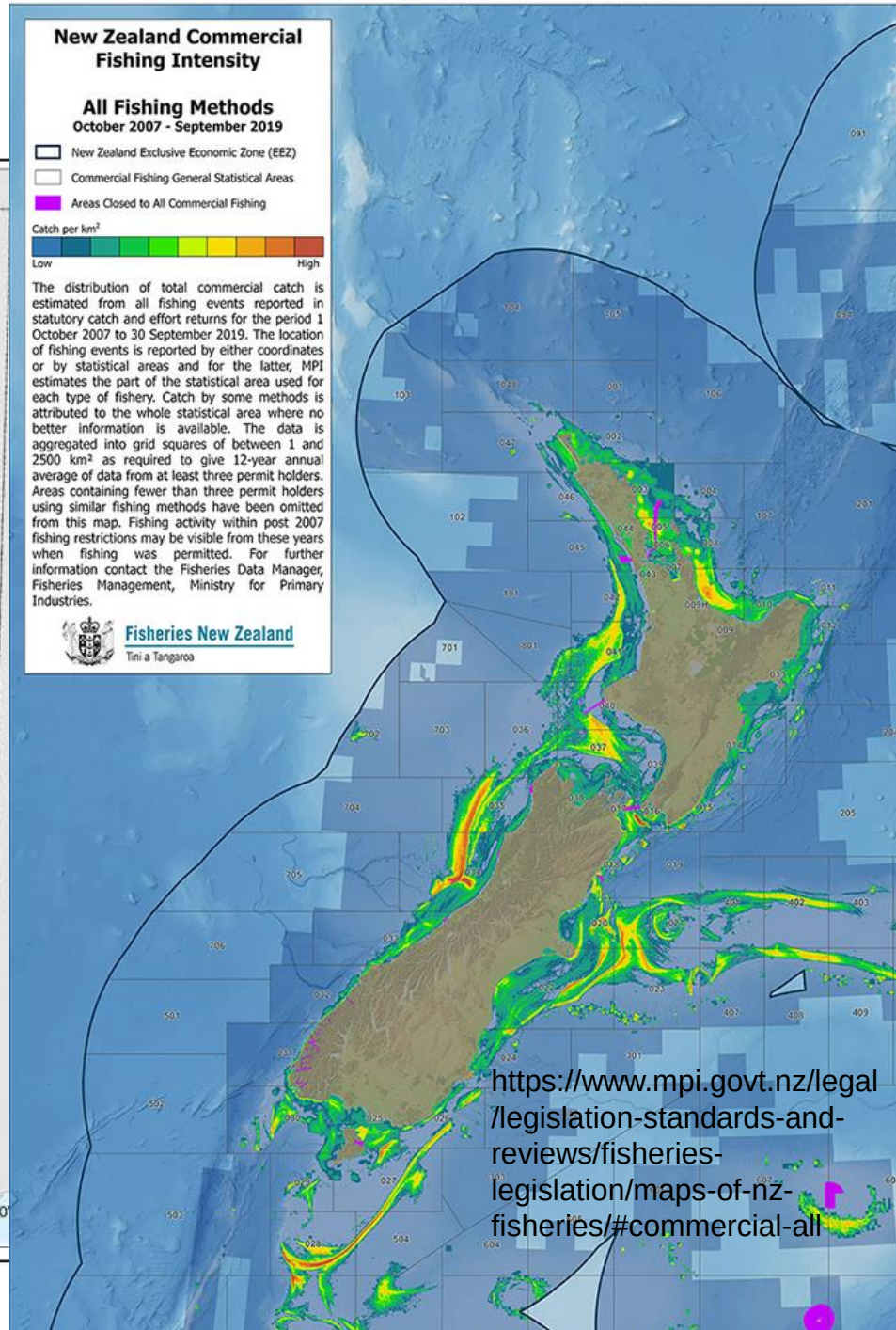


From Ngā Motu Marine Reserve Society Submission (page 16).

Marine Mammal Hotspot



Presentation by expert witness S. Childerhouse at EPA TTR seabed mining reconsideration hearing, 15 March 2024



https://www.mpi.govt.nz/legal/legislation-standards-and-reviews/fisheries-legislation/maps-of-nz-fisheries/#commercial-all

NZ Blue whale population

“…everybody agreed that it's important to consider the cumulative impacts that these populations might face. That's not just the impacts from the seabed mining, but that's those impacts on top of what they're already experiencing from dramatic impacts of climate change to having vessel traffic through their area to oil and gas exploration in the area…”

Leigh Torres, expert witness at EPA TTR seabed mining reconsideration hearing, 15 March 2024

Cause of death?

- **Extreme weather event**
- **Lack of food source**
- **Marine heat wave**
- **Disease**
- **Others...**

Impact assessment

- **“To be accurate risk calculation relies on adequate data and understanding of the species that will potentially be impacted.**
- **At this stage it is likely premature to be considering impact assessment for any large REG development**
- **The scale of proposals is likely to have non-linear impacts.**
- **There are existing pressures on NZ’s biodiversity. The capacity of the environment to absorb additional impact will need to be understood.**
- **Alternatives need to be thought about broadly and for all stages –pre-construction through to decommissioning”**

Department of Conservation Presentation at Ara Ake Offshore Renewable Energy Forum, 9 March 2023, New Plymouth https://www.araake.co.nz/news-and-events/oref/

E.g. Matuku / Bittern

Photo: DOC presentation at NZWEA conference, Sep 2023

Precautionary Principle! Don’t Fast Track!

Aotearoa New Zealand – Leadership

Demand already exists

- Power to X
- Road transport
- Air and marine transport
- Industrial thermal processes
- Recycling
- Healthy Homes Initiative

The reality

- Renewable energy and fossil fuels cannot meet growing energy demands without exacerbating our global polycrisis (e.g. climate, ecological, social…)

- Export economy not sustainable environmentally, socially or economically

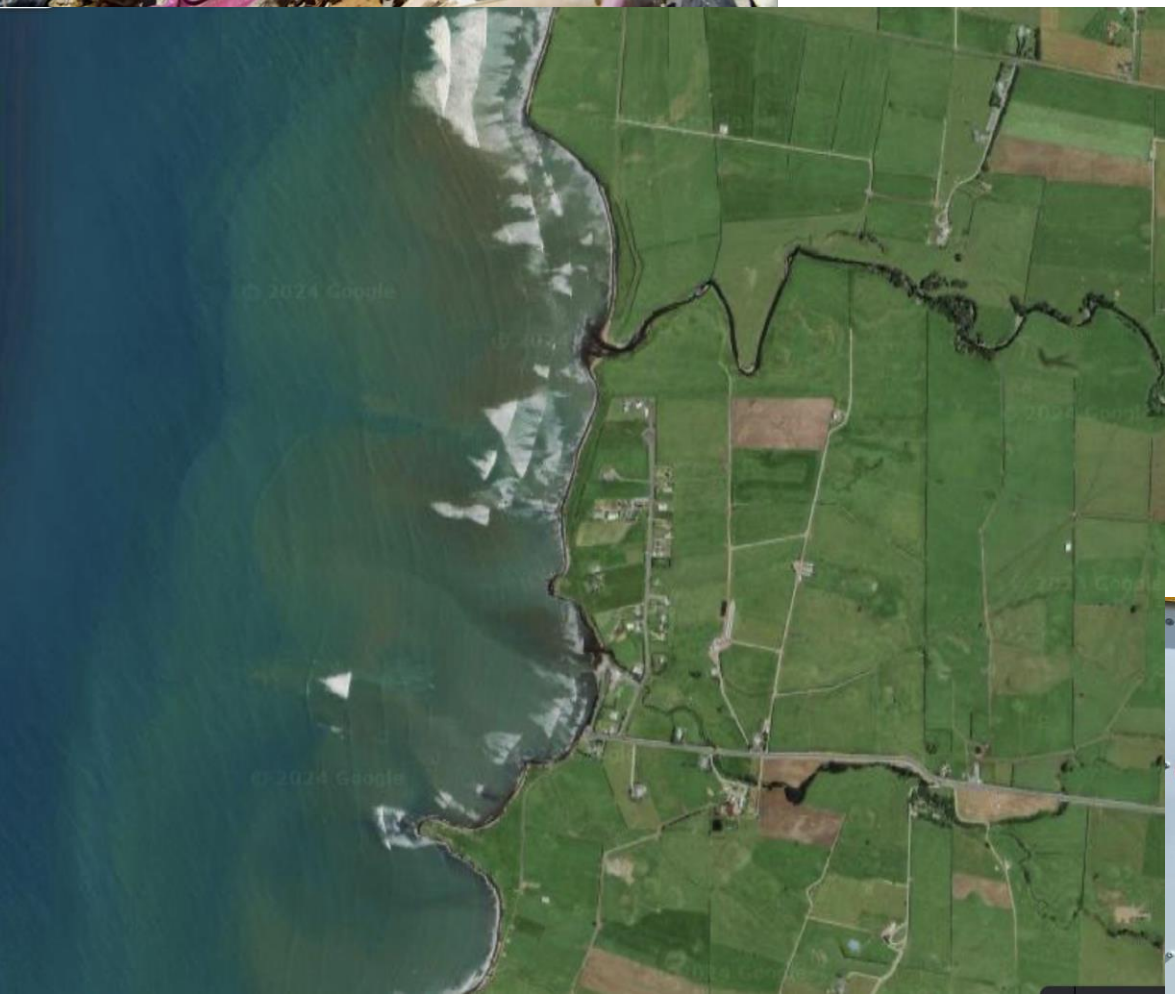
- Alternatives exist

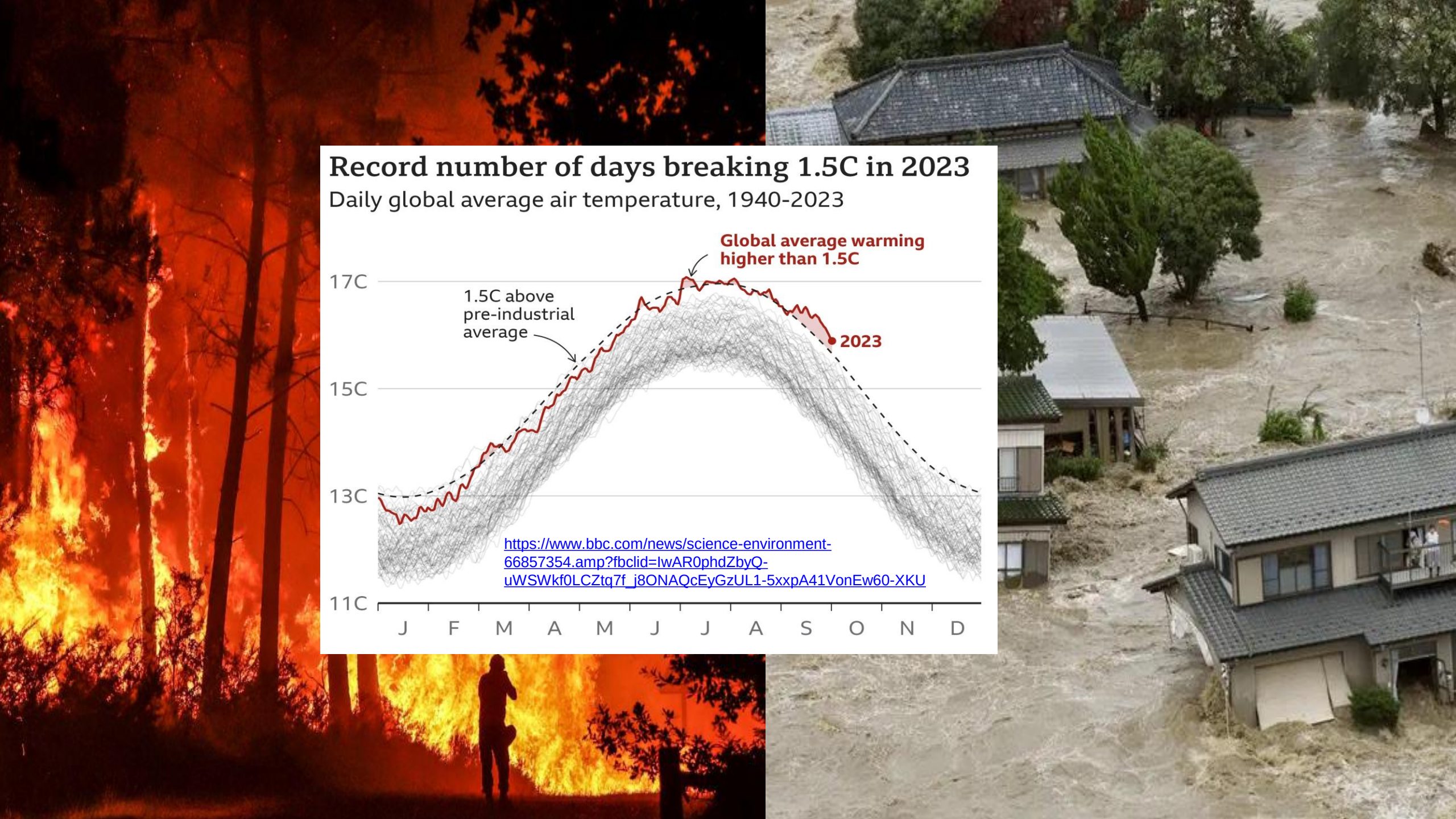
- Put essential needs as top priorities, shrink other energy & material demands

Wind Quarry Zealandia, March 2023

https://degrowth.nz/
https://theconversation.com/polycrisis-may-be-a-buzzword-but-it-could-help-us-tackle-the-worlds-woes-195280

Rubbish, Run-off & Rahui




Record number of days breaking 1.5C in 2023
Daily global average air temperature, 1940-2023
Global average warming higher than 1.5C
1.5C above pre-industrial average
2023
17C
15C
13C
11C
J F M A M J J A S O N D
https://www.bbc.com/news/science-environment-66857354.amp?fbclid=IwAR0phdZbyQ-uWSWkf0LCZtq7f_j8ONAQcEyGzUL1-5xxpA41VonEw60-XKU

Social Licence?

1. Contributes to **actual reduction in carbon emissions**
2. **Zero harm** and beneficial to **Taiao** / ecological systems
3. **Zero harm** and beneficial to local **communities**