

WINDS OF CHANGE

Offshore wind is being promoted as a clean energy solution for Aotearoa, but its potential impacts on our unique marine habitats remain poorly understood. **Catherine Cheung**

The world's first offshore wind farm was built off the coast of Denmark in 1991. It consisted of 11 turbines in the shallow waters of the Baltic Sea, near Lolland. It was tiny by today's standards, with total capacity of 4.95MW, and operated for more than two decades before being decommissioned in 2017.

While onshore wind farms have been operating in Aotearoa New Zealand since 1997, there are currently no offshore equivalents. But that could be about to change.

The New Zealand government is establishing a regulatory framework that would allow offshore wind and other renewable energy developers to seek feasibility and commercial permits, with marine consents potentially processed under the Fast-track Approvals Act. At the time of writing, the Offshore Renewable Energy Bill was awaiting Royal assent.

The potential impact of building giant offshore wind farms on our ocean environment, marine mammals, and seabirds is currently unknown, and that is worrying conservationists.

The iron-sand mining operation in the South Taranaki Bight would have directly conflicted with offshore wind development in an area developers consider New Zealand's most promising site. But Trans

Tasman Resources has withdrawn its application, paving the way for an energy company to apply for resource consent for the country's first offshore wind farm.

Three offshore wind developers have left New Zealand over the past 18 months, amid weakening investor confidence. Communities in Taranaki are now closely watching the three remaining offshore wind farm developers – Taranaki Offshore Partnership, New Zealand Offshore Wind, and Wind Quarry – to see who will be the first to apply for a fast-tracked feasibility permit and in which location.

Many people across political parties and backgrounds believe that offshore wind is clean and green, is good for energy security, and may even lower power bills. But do these claims stack up across three measures that matter – environmental impact, social good, and economic cost – rather than business profit alone?

ENVIRONMENTAL IMPACTS

Offshore wind development causes environmental harm at all stages, from pre-construction to decommissioning. The impacts on seabed ecosystems are greater than previously thought, with cascading effects on other species

and ecology yet to be fully understood. These include physical disturbance, introduction of invasive alien species, and changing species composition due to increased hard surfaces and vessel movements.

Underwater noise – both acute and chronic – can affect the wellbeing of marine mammals, which rely on sound to find food, find mates, and navigate. Aotearoa is a marine mammal hotspot, with 57 species recorded. The South Taranaki Bight is a feeding and nursery ground for the endangered pygmy blue whale, and Taranaki and its adjacent coasts are home to the critically endangered Māui dolphin. Underwater noise also affects the different life stages of fish, including some of economic importance.

Electromagnetic field emissions from subsea cables disproportionately affect sensitive species such as sharks, rays, eels, and lobsters across their various life stages. The effects on these species at individual and population level are poorly understood, especially in the context of marine heat waves, ocean acidification, and deoxygenation.

Recent studies show that large-scale offshore wind farms in the North Sea can change local ocean currents, stratification, nutrient flow, sediment carbon storage, and sea surface temperature.

Bird collision with wind turbines is the most studied impact. BirdLife Europe and Central Asia says the true toll is still not understood, nor is how to effectively reduce casualties – particularly among migratory birds and threatened species. Given that Aotearoa is the seabird capital of the world, with many unique species and distinct behaviours, a lot is at stake.

WHERE WOULD OFFSHORE WIND FARMS GO?

Most offshore wind farms would be located in New Zealand's Exclusive Economic Zone (EEZ). Three main areas have been identified as locations of interest.

- 1 SOUTH TARANAKI BIGHT** The most attractive location for developers so far. The proposal from Taranaki Offshore Partnership, a joint venture between Copenhagen Infrastructure Partners and the New Zealand Super Fund, would consist of up to 70 wind turbines, each 260m high, generating up to 1GW in total. The proposal from New Zealand Offshore Wind, a brainchild of Taranaki-based Elemental Group, would generate 900MW. US-based Wind Quarry is also interested in this area, albeit closer inshore.
- 2 WAIKATO** Developers have described the South Auckland-Waikato offshore area as having an excellent wind resource, with access to existing electricity transmission infrastructure and growing energy demand from industrial customers such as New Zealand Steel and Fonterra. New Zealand Offshore Wind proposes to build 54 bottom-fixed turbines to generate 810MW of power in phase 1.
- 3 FOVEAUX STRAIT, SOUTHLAND** The waters around Te Ara-a-Kiwa Foveaux Strait and near Rakiura Stewart Island have also been identified as a location of interest.



→ The Department of Conservation has called for caution, saying “Available data and overseas studies are not sufficient to adequately assess the impacts of offshore wind farming.”

In its report *Overview of the potential ecological impacts of three offshore locations for wind farms in Aotearoa New Zealand* (November 2025), 10 leading marine and seabird experts said: “Offshore wind farming is a new industry for Aotearoa New Zealand, and the siting, construction and operation of wind farms should be assessed in the context of the country’s environment and fauna.”

The report focuses on seabirds, shorebirds, sharks, leatherback turtle, marine mammal species, and ecologically important benthic biodiversity for the three locations of interest – off the Taranaki, Waikato, and Southland coasts.

It identifies substantial knowledge gaps, such as how seabirds use space over time and the ecology, movements, and hearing sensitivities of marine mammal species. It also highlights the potential cumulative impacts from individual and multiple projects alongside existing pressures – and recommends “further work to support site-based comprehensive environmental assessments before wind farm developments proceed”.

Given inadequate understanding of their potential environmental impacts, fast-tracking offshore wind projects – under extreme time pressure and with limited independent expert involvement – is imprudent.

WHAT ABOUT SOCIAL GOOD AND ECONOMIC COSTS?

Onshore and offshore wind energy has the potential to reduce greenhouse gas emissions and help mitigate climate change – but only as part of a genuine national commitment to cutting emissions, not as a fig leaf for continued fossil fuel expansion.

The current government’s record gives little cause for confidence. It has weakened New Zealand’s emissions reduction targets while actively promoting



Toanui flesh-footed shearwater. © Jake Osborne

fossil fuels: listing coal mines for fast-tracking, co-financing fossil gas exploration, and enabling the import of liquefied natural gas (LNG).

The Crown’s Te Tiriti o Waitangi obligations require that the rights, interests, and worldviews of Māori be considered when approving developments, such as offshore wind farms. How would the cultural connections and kaitiaki stewardship role of Māori be affected if taonga species – tohorā whales, toroa albatross, whai rays, tuna eels, and piharau lamprey – are adversely impacted?

The Parliamentary Commissioner for the Environment found that the Offshore Renewable Energy Bill narrowed engagement requirements to Māori groups that have already settled Treaty claims or groups mentioned in other Acts and made no mention of Treaty principles.

In practice, the large footprint of an offshore wind farm could lock out customary and commercial fishing for decades.

Conversely, the exclusion of destructive trawling and reduced fishing pressure could bring positive outcomes – some target species might recover and “spill over”, increasing fishery productivity outside the exclusion zone. But such benefits, if they eventuate, would come only after years of habitat damage, disturbance, and alteration.

Certainly, there will be jobs – especially during construction. But building efficiency measures like home insulation and rooftop solar offer more jobs more steadily.

The World Resources Institute has reported that ecosystem restoration offers 3.7 times more jobs than oil and gas production per \$1 million invested. In 2025, the International Renewable Energy Agency reported that, globally, solar PV employs far more people than wind energy or liquid biofuels.

Will offshore wind farms ease New Zealand’s cost-of-living crisis and rising power bills? The likely answer is no. Offshore wind farms currently cost more than twice as much as onshore equivalents. The accounting firm PwC estimated that Port Taranaki would require over \$320 million in upgrade to support a 0.5GW project.

For each megawatt of energy generated, offshore wind farms require several times more rare earth metals than onshore wind farms. Critical minerals are a hot topic globally, with the US racing to gain access amid significant geopolitical tension. Mining causes environmental and social harm wherever it occurs. Rich countries like New Zealand already consume many times more energy and raw materials per person than low-income countries.

Crucially, without electricity market reform to support energy conservation, equity, and distributed renewable generation – while disincentivising fossil fuel supply and demand – household energy costs will continue to rise.

RIGHT RENEWABLES IN RIGHT PLACES

A recent UK national security assessment found that global nature loss and ecosystem collapse pose a direct threat to national resilience, security, and prosperity.

Aotearoa is not immune – but we have a lot going for us. We are endowed with remarkable natural assets, indigenous knowledge, and ingenuity. Our geothermal energy resource is world renowned. There are plenty of onshore wind projects that have been consented or are listed for fast-track consideration. Our rooftops are underutilised for harnessing solar energy.

The question is not whether we need more renewable energy but whether we are choosing the right tools, in the right places, for the right reasons.

Offshore wind may yet have a role to play. But rushing large-scale energy infrastructure into some of our most biodiverse and culturally significant marine environments – under fast-track consenting processes that limit independent scrutiny – is not the clean green solution it is being sold as.

What Aotearoa actually needs is a whole-of-system national energy strategy: one that prioritises sufficiency over growth, invests in what we know works, without regrettable harm, and gives the planet space to heal.



The rocky reefs off South Taranaki are full of marine life. © Project Reef



The first commercial offshore wind farm in the US opened in 2016. Block Island Wind Farm turbines. © Evan Krape/Oregon State University

HOW DOES WIND STACK UP?

New Zealand’s total electricity generation capacity is around 10.6GW. Onshore wind’s installed capacity represents roughly 12% of that total.

However, wind generation only makes up around 9% of New Zealand’s actual electricity output, according to the Ministry of Business, Innovation & Employment, reflecting the fact that wind is intermittent and doesn’t blow constantly at full strength.

For comparison, hydro power accounts for over 5GW of installed capacity and provides the majority of New Zealand’s electricity, while geothermal makes up around 20% of generation.

Wind is a solid third-place renewable, but well behind those two workhorses.

But onshore wind generation has been growing, hitting record outputs in 2024, up 22% on 2023 levels, boosted in part by the new 176MW Harapaki Wind Farm, northwest of Napier, which became fully operational in July 2024.

The New Zealand Wind Energy Association is tracking 39 onshore wind projects in the pipeline with a total capacity of 7.1GW.

Electricity demand is projected to grow 2%–2.2% annually, requiring around 10GW of new capacity by 2040, primarily from renewables.

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New Zealand pygmy blue whales, South Taranaki Bight. © Oregon State University