Before the Taranaki VTM Expert Panel

under: the Fast-track Approvals Act 2024 and Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012

in the matter of: an application by Trans-Tasman Resources Limited for marine consents to support a seabed mining operation in the South Taranaki Bight

Statement of Evidence of **Giacomo Caleffi** (Corporate) on behalf of Taranaki Offshore Partnership

Dated: 3 October 2025

Reference: [redacted]

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STATEMENT OF EVIDENCE OF GIACOMO CALEFFI ON BEHALF OF TARANAKI OFFSHORE PARTNERSHIP

INTRODUCTION

1 My name is Giacomo Caleffi.

2 I am a Business Development Director at Copenhagen Offshore Partners (*COP*). I have held this role since 2022. My role mainly involves i) management, development and maturation of offshore wind projects, ii) engagement with investors, stakeholders, communities and government agencies, and iii) coordination of internal workstreams with engineering, permitting, finance, legal, EPC and grid teams to support project development.

3 I hold a MSc in Civil Engineering from Universitá degli Studi di Parma and a Postgraduate Certificate in Economic Thinking from Victoria University of Wellington. I have achieved Chartered Engineer status in both the UK and New Zealand.

4 I have over ten years of experience in offshore wind energy, of which seven as a structural engineer designing offshore wind turbine foundations and offshore substation topside structures, and three in my current role as business development leader.

5 I also have three years of experience in seismic design of commercial buildings in Wellington and two years of experience in Environmental Engineering and water monitoring for hydro and thermal power plants in Italy.

6 Although this matter is not before the Environment Court, I confirm that I have read the Code of Conduct for Expert Witnesses in the Environment Court Practice Note (2023). As I am employed by Taranaki Offshore Partnership (*TOP*), I acknowledge I am not independent. However, I have sought to comply with the Code of Conduct. This statement of evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

SCOPE OF EVIDENCE

7 I am authorised to make this statement on behalf of TOP in relation to the application lodged by Trans-Tasman Resources Limited (*TTRL*) for marine consents under the Fast-track Approvals Act 2024 (*FTAA*) and Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (*EEZ Act*).

8 TTRL seeks marine consents to extract 50 million tonnes of seabed material per year, over 20 years, mechanically recover 5 million tonnes of heavy mineral sands concentrates containing iron ore, vanadium and titanium, and return the de-ored material to the seabed (*Proposal*).

9 My evidence will:

9.1 Introduce TOP;

9.2 Address the offshore wind resource and opportunity in New Zealand, including Government policy supporting the development of offshore wind via the Offshore Renewable Energy Bill;

9.3 Introduce TOP's project in the South Taranaki Bight (*STB*);

9.4 Address the interaction between the Proposal and TOP's project;

9.5 Explain TOP's commitment to offshore wind development in New Zealand; and

9.6 Address the implications of uncertainty for other offshore wind farm (*OWF*) projects.

10 In summary, TOP's view is that:

10.1 TTRL's Proposal is incompatible with offshore wind in the same location; and

10.2 The Proposal creates risks and uncertainties that mean that it is highly unlikely that an offshore wind project would secure investment or funding in the South Taranaki Bight if the Proposal is approved.

INTRODUCTION TO TOP

11 Taranaki Offshore Partnership is a joint venture between the Guardians of New Zealand Superannuation as manager and administrator of the New Zealand Superannuation Fund (*NZ Super Fund*) and Copenhagen Infrastructure Partners (*CIP*). TOP was formed in 2022 specifically to investigate and pursue offshore wind farm projects in New Zealand.

12 The NZ Super Fund is a global portfolio of investments, established in 2001 with the passing of The Superannuation and Retirement Income Act. This Act also established The Guardians of New Zealand Superannuation, fund manager of the NZ Super Fund.

13 The Fund was designed to act as a tax-smoothing vehicle, reducing the cost to future generations of taxpayers of providing a universal pension.

14 International sovereign wealth fund experts GlobalSWF recently rated the NZ Super Fund as the world's best performing sovereign wealth fund over the past 10-year and 20-year periods. Since

inception, the NZ Super Fund has generated an average annualised return of more than 10 percent.

15 The NZ Super Fund is an experienced infrastructure investor. In partnership with NZX-listed Infratil, it has funded extensive renewable energy infrastructure developments in North America (through Longroad) and Europe (through Galileo Green Energy).

16 The Guardians is an autonomous Crown entity; while it is accountable to the Government, it has operational independence and makes its investment decisions on a purely commercial basis.

17 CIP was founded in 2012 and is the world's largest dedicated fund manager within greenfield renewable energy investments and a global leader in offshore wind. The funds managed by CIP focus on investments in offshore and onshore wind, solar PV, biomass and energy-from-waste, transmission and distribution, reserve capacity, storage, advanced bioenergy, and Power-to-X. CIP manages twelve funds and has to date raised approximately EUR 30 billion for investments in energy and associated infrastructure from more than 160 institutional investors including investors based in Aotearoa New Zealand and international superannuation funds. CIP has projects in 30+ countries across six continents.

18 COP is the exclusive global offshore wind development partner to CIP, including for projects in New Zealand.

19 CIP and COP have a proven track record in delivering offshore wind projects worldwide, having been leaders in project origination in new markets. This includes a robust pipeline of work for the APAC region, and offshore wind farms operating in Germany, South Korea, Taiwan. In Australia, CIP and COP are developing Australia's most advanced offshore wind project, Star of the South, and another project also located in Gippsland, Kut-Wut Brataualung, and continue to progress opportunities to build the pipeline.

OFFSHORE WIND IN NEW ZEALAND

New Zealand's wind resource

20 Due to its location in the 'Roaring Forties' wind corridor, New Zealand has remarkable offshore wind conditions, with average annual wind speeds amongst the highest in the world. Wind speeds are generally high around the whole country, and particularly in the region between the North and South Islands – thanks to the funnelling effect of Cook Strait – and in the Foveaux Strait region.

The opportunity

21 While New Zealand's current electricity generation is predominantly from renewable sources, a significant increase in new renewable generation will be needed as electricity becomes a larger part of the overall energy mix. Some of this future electricity demand will be met by onshore renewables, however there is growing evidence that

onshore technologies alone will not be deployed fast enough and at sufficient scale to satisfy the demand growth. Offshore wind can fill this gap by diversifying the energy mix and delivering large scale generation in New Zealand. The benefits of offshore wind include:

21.1 *Powerful solution to meet growing electricity demand*: We estimate that offshore wind farms can generate greater renewable power output per unit area than onshore wind or large-scale solar. Consequenrly, offshore wind offers a more compact, efficient way to meet electricity needs.

21.2 *Reliable power*: Offshore wind has a higher capacity factor, meaning it provides more consistent generation. This reduces the need for back up generation, and makes it a reliable part of the energy mix.

21.3 *Simplified grid integration*: A single offshore wind farm connected to the grid through one transmission point can reduce the need for extensive grid augmentation compared to multiple smaller projects.

21.4 *Enhanced grid resilience for the North Island*: Offshore wind connected directly to the North Island transmission network strengthens power system security and resilience, reduces reliance on the Cook Strait cables connecting generation in the South Island to demand centres in the North Island, and enhances the energy security of NZ's major urban areas.

21.5 *Greater social acceptance and reduced land-use conflicts*: Offshore wind projects typically face fewer community concerns and land-use conflicts than equivalent large onshore developments, making them easier to develop with positive social license.

21.6 *Boosting regional economies and skill development*: Offshore wind projects are large infrastructure investments that drive long-term job creation, skill development and economic growth in local communities.

21.7 *Supporting large scale industrial decarbonisation*: The scale of offshore wind is sufficient to support large-scale industrial decarbonisation, while also enabling growth of potential new, power-intensive industries such as green hydrogen production to support broader emissions reduction goals and economic development.

22 Offshore wind is a key energy source used globally to reduce greenhouse gas emissions (*GHG*) that has comparatively low lifecycle emissions of its own. A 2024 study by Victoria University based on TOP's proposed offshore wind project estimated a carbon footprint of between 18 and 25 gCO2eq/kWh, an emissions payback time ranging of 2.8-3.9 years for avoided emissions (relative to

combined cycle gas turbines), and an energy payback time of less than one year.[1] This makes offshore wind one of the most effective technologies to help realise NZ's ambitions to reach net-zero emissions by 2050.[2]

23 The New Zealand energy system is currently under major stress due to a shortage of domestic natural gas and recurring 'dry years' (years with lower rainfall than average, meaning hydro lakes across the country generate less electricity than expected). Lately, this has led to extremely high electricity prices, which in turn is driving higher living costs for consumers and contributing to the closure of several commercial and industrial enterprises. Demand for electricity is only expected to keep growing as the country increasingly electrifies with reduced access to natural gas, which will compound these issues even further.

24 There is consensus that the best route to reducing the pressure on the energy system is to increase the supply of electricity – ideally from clean, renewable sources. This can be achieved in part by developing low-cost renewables like onshore wind and solar. However, we know from overseas experience that in the longer run those smaller, distributed onshore projects tend to encounter growing community opposition, complex consenting issues, and cost escalation.

25 Indeed, one large offshore wind farm like the one TOP is proposing in South Taranaki can provide the same amount of power as eight onshore wind farms of the scale currently being developed in New Zealand. Offshore wind turbines feeding bulk electricity into the North Island in 2035 should be seen as a strategic tool to enhance long-term resilience and security of the electricity system.

26 There are numerous international examples of the benefits of offshore wind development. The UK provides a good case for the offshore wind success story. Offshore wind currently generates almost 20% of the UK's electricty needs, with installed capacity having increased more than four-fold since 2012 and a further project pieline of some 78 GW planned, consented or anticipated. [3] As a result, the UK offshore wind sector produces considerable public benefits: powering approximately 15 million homes annually; adding £2-3bn of value to the UK economy per GW of new

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1 Developing Offshore Wind Farms in Aotearoa New Zealand: An Analysis of Life Cycle Carbon Emissions, Materials and Energy Implications

2 National Impacts Report: New Zealand Offshore Wind Industry (Final Embargoed - 20 March 2024)

3 UK Government, 'Offshore Wind Net Zero Investment Roadmap' March 2023, available here: <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1167856/offshore-wind-investment-roadmap.pdf> pages 5-6.

generation; [4] and supporting close to 40,000 jobs.[5] The UK has also seen other social benefits of offshore wind, including revitilisation of local communities (eg Grimsby, Hull, and Blyth in the UK), and increased investment in the construction and supply chain sectors linked to the offshore wind sector.

Government policy support for offshore wind

27 The New Zealand Government has set a target of doubling renewable energy by 2050.[6] As recently recognised by the Minister of Energy:[7]

> Offshore renewable energy is one of this country's untapped energy sources and has the potential to help us grow an economy where transport and industry are powered by clean energy and to reach net zero greenhouse gas emissions by 2050.

28 I understand that the Government has recognised that electricity demand projections indicate that demand for renewable electricity will increase by around 70 per cent by 2050, which equates to approximately 12.6GW of new generation capacity.[8]

29 The Government has also noted that the electrification of hard-to-abate sectors, new energy-intensive industries (such as hydrogen or sustainable aviation fuel production), and additional renewable energy export market may cause demand to double or even treble.[9]

30 Offshore wind represents a generation source that is uniquely capable of meeting this level of demand in a manner that is consistent with both New Zealand's domestic and international GHG emissions reduction targets.[10]

31 Government initiatives to support offshore wind development include: developing the Offshore Renewable Energy Bill which the Government has committed to pass in the first quarter of next

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4 Renewable UK, 'Offshore Wind Industrial Growth Plan' 2024, available here <https://www.renewableuk.com/media/rqvlqzu0/offshore-wind-industrial-growth-plan.pdf>.

5 Renewable UK, 'Wind Industry Skills Intelligence Report' June 2025, available here <https://www.renewableuk.com/media/jvsdey0k/ruk-owic-offshore-wind-skills-report_2025.pdf>.

6 Ministry for the Environment, '*Our journey towards net zero*' New Zealand's Second Emissions Reduction Plan 2026-30, December 2024, page 37. MBIE, 'At a glance: New Zealand's Energy Package' dated October 2025, page 3.

7 Hon Simeon Brown, (then Minister of Energy), '*Cabinet Paper: Offshore Renewable Energy Regulatory Regime*', 20 December 2024.

8 Ministry of Business, Innovation and Employment 'Offshore Renewable Energy Briefing', 14 December 2023, at paragraph 32.

9 Ibid.

10 See: section 5Q Climate Change Response Act 2002; and New Zealand's Second Nationally Determined Contribution under the Paris Agreement.

year;[11] passing the Fast-track Approvals Act (with the Government having stated it intends to amend the fast-track approvals regime to include consenting for offshore renewable energy projects once the regulatory regime is in place), and; advancing amendments to RMA national direction for renewable energy and transmission.

Offshore Renewable Energy Bill

32 TOP has been working closely with MBIE for the past three years to support the development of the Offshore Renewable Energy Bill and secondary legislation.

33 The proposed Bill and the associated feasibility permit regime will award site exclusivity to developers, providing the first necessary step towards continued investment. I understand the Government intends to pass the Bill in the first quarter of next year and open the first feasibility permit round shortly thereafter.

34 TOP's current estimate of the total spend required prior to making a final investment decision (likely in 2030) is in excess of NZD300m. A strong regulatory regime and stable investment conditions is essential to unlock this level of commitment by project sponsors.

TOP'S OFFSHORE WIND PROJECT

35 Over the last four years, TOP has been investigating the potential for offshore wind developments in multiple locations across New Zealand. After carrying out due diligence on a number of offshore sites around the country, we have identified part of the South Taranaki Bight as the prime area for development.

Proposed Site for TOP's Taranaki Offshore Wind Farm

36 The preferred site for TOP's proposed Taranaki Offshore Wind Farm (*OWF Project*) sits within an area located 25-40km off the coast of South Taranaki, as shown in **Figure 1**.

37 The area in green is delimited to the South by the 60m water depth contour (the deepest that allows for installation of wind turbines secured to the seabed) and to the North by the EEZ (12 nautical mile) boundary. At roughly 700km^2, it is wide enough to host 2-3 GW of offshore wind.

[11] MBIE, 'At a glance: New Zealand's Energy Package' dated October 2025, page 6.

Figure 1 – OWF Project area of interest (green)

38 The OWF Project comprises a 1GW (approximately 70 wind turbine) offshore wind farm, which could produce enough electricity to power over 650,000 homes.

39 The exact shape and extent of the site required for the OWF Project will not be determined until the feasibility studies have been completed; however, TOP expects the OWF Project would occupy a total area of some 250km^2.

40 With turbines spaced 1.5-2km apart to optimise wind capture, the cumulative footprint of all wind turbine foundations on the seabed is expected to be much less than this - with typical project footprints covering less than 1% of total wind farm area.[12]

41 The STB is by far the best location for the establishment of New Zealand's first offshore wind farm, for three main reasons:

41.1 South Taranaki experiences some of the strongest and most consistent wind speeds in the country – in line with the very best development sites in the world. TOP has confirmed the quality of this natural resource using fixed and floating Light Detecting and Ranging Devices (*LiDARs*) at various locations in the EEZ area of the South Taranaki Bight. LiDARs use laser

[12] U.S. Department of the Interior - Bureau of Ocean Energy Management Office of Renewable Energy Programs, 'Comparison of Environmental Effects from Different Offshore Wind Turbine Foundations' August 2021.

technology to measure wind speeds at various heights all the way up to 300m above sea level.

41.2 The preferred area has water depths of between 20m and 60m. This depth allows the installation of offshore wind turbines fixed to the seabed by means of the most efficient and cost-effective foundation technology: the monopile. The seabed around most of the New Zealand coast drops steeply, making installation of these types of turbines elsewhere impossible.

41.3 The relative proximity to shore allows for shorter cables for exporting electricity (which are less costly and less exposed to risk of failure) and makes the offshore wind farm easily accessible to maintenance crews and support vessels.

42 For these reasons, an offshore wind farm built in this area of the STB would have the lowest Levelised Cost of Electricity[13] in New Zealand (i.e. it would be the cheapest and most efficient offshore wind project that New Zealand could achieve).

Actions taken to advance the Taranaki OWF Project

43 While the regulatory settings for offshore wind were being developed, in the last four years TOP has initiated and conducted several feasibility activities to better understand the environmental conditions, wind resources and public perception of large-scale offshore wind.

44 In addition to the research undertaken to confirm wind speeds outlined above, feasibility studies undertaken by TOP so far have included, amongst many others, the following activities:

44.1 Deployment of a FLiDAR (Floating Light Detecting and Radar) between 2022 and 2024 to measure wind speeds in the EEZ area of the STB. TOP provided the relevant notices to the Environmental Protection Authority for a Permitted Activity (Marine Scientific Research) under the Exclusive Economic Zone and Continental Shelf (Environmental Effects—Permitted Activities) Regulations 2013. TOP complied with all pre- and post-activity requirements and maintained close engagement with the EPA throughout deployment of the FLiDAR.

44.2 Deployment of three underwater microphones in the South Taranaki Bight in 2024 to record ambient noise to help monitor the presence and migration patterns of marine mammals, helping to inform planning for future assessments of environmental effects.

[13] 'Levelised cost of energy' means the cost of electricity generation over the lifetime of a power plant or energy system.

44.3 Technical assessment in 2023 of what is required for the Port of Taranaki and for the harbour at Pātea to be able to support the development and operation of an offshore wind farm.

44.4 Ongoing energy market studies to assess the current supply/demand gap and determine how offshore wind can help bridge that gap, reduce pressure on electricity prices and enhance the resilience of the energy system.

44.5 An assessment of seismic conditions for offshore wind in New Zealand in 2023.

44.6 An Industry Capability Mapping Study (2022-2024) to identify the availability and transferability of current skills, alongside the opportunity for new highly-skilled jobs for the region and more widely across New Zealand.

44.7 Establishment of technical expert groups to conduct literature reviews and gap analysis to direct baseline environmental research.

44.8 Establishment of a marine mammal expert group comprising New Zealand and international whale and dolphin experts to consider potential risks to marine mammals requiring further assessment and the design of targeted mitigation measures.

44.9 Establishment of an avifauna expert group and commissioning this group to develop a risk assessment tool that can be used for any offshore wind development and will be made available to all developers, regulators and the public.

44.10 Extensive engagement and consultation with iwi, local communities, research institutions, local and central government agencies.

45 In undertaking the above and related activities TOP has spent more than NZD10m in feasibility studies to date.

INTERACTION BETWEEN THE PROPOSAL AND TOP'S OWF

46 The area suitable for offshore wind development is limited to a small portion of the South Taranaki Bight. **Figure 2** below shows this area (in green) and the Proposal area (in red). TTRL's Proposal area is located right in the middle of the STB's premiere wind resource area and TOP's areas of interest. TTRL's Proposal and TOP's OWF Project could therefore overlap to a significant extent (the 66km2 Proposal area alone could be up to ~25% of the area of a windfarm of the scale anticipated by TOP).

Figure 2 – Overlap between TTRL Application Area (in red) and the Area of Interest for offshore wind (in green)

47 While the total offshore wind area is greater than the expected size of TOP's OWF Project, further evaluation is required to optimise the wind farm's siting and layout. Any carveouts in the available area for offshore wind will result in a significantly more uncertain and challenging investing environment - potentially leading to offshore wind projects being abandoned.

48 The turbines of the offshore wind farm will be connected to shore by subsea electrical cables, likely buried just beneath the seabed. **Figure 3** below shows TOP's area of interest (in green) and the potential corridor (in blue) where export cables would need to be located to connect the wind farm to the national transmission grid onshore. This corridor will be refined as more detailed feasibility studies progress, but ideally it would be kept as available as possible to avoid constraining the development of offshore wind.

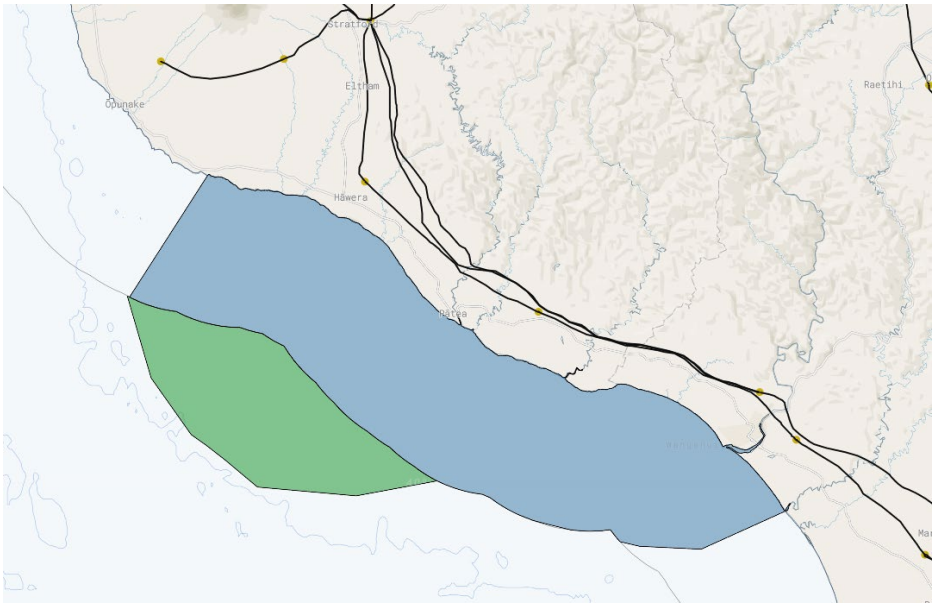

Figure 3 – Offshore wind farm area of interest (green) and potential area for routing of export cables (blue)

49 I have reviewed the evidence of Mr James Perry and agree with his conclusions in relation to the significant challenges presented by locating the Proposal in the middle of the offshore wind area and potential cable routing areas.

TOP'S COMMITMENT TO OFFSHORE WIND DEVELOPMENT

50 The two sponsors behind TOP, the NZ Super Fund and CIP, are strongly committed to investigating and developing offshore wind in New Zealand.

51 CIP recognises the excellent wind conditions of South Taranaki, which put the area of interest amongst the greatest potential across its global portfolio.

52 CIP is also strongly invested in offshore wind in Victoria, including having invested in the up to 2.2 GW Star of the South project, which is the most advanced offshore wind project in Australia.

53 As an experienced offshore wind investor, CIP is aware of the headwinds the energy industry is facing, particularly in the US, and the challenges some of its competitors are experiencing. However, the Asia-Pacific remains a key market for CIP's offshore wind investments.

54 International sovereign wealth fund experts GlobalSWF recently rated the NZ Super Fund as the world's best performing sovereign wealth fund over the past 10-year and 20-year periods. Since inception, the NZ Super Fund has generated an average annualised return of more than 10 percent.

55 The NZ Super Fund is an experienced infrastructure investor with extensive renewable energy infrastructure developments in Europe (through Galileo Green Energy and CIP's Energy Transition Fund), and in North America (through 'Longroad', in partnership with Infratil). Since it was established in 2016, Longroad has developed wind and solar generation facilities with an output equivalent to one-third of New Zealand's total installed generation capacity.

56 The NZ Super Fund's governing legislation, the Superanuation and Retirement Income Act 2001, requires its manager, the Guardians of New Zealand Superannuation, to invest the fund on a prudent commercial basis. In 2009, the Government directed the Guardians to identify and consider opportunities to increase the allocation to New Zealand assets in the NZ Super Fund in a manner consistent with the requirements of the Act.

57 The NZ Super Fund regards the OWF Project as an exciting investment opportunity and a chance to demonstrate its willingness to help develop major infrastructure that benefits the country and aligns with its purpose; *'Sustainable Investment Delivering Strong Returns for All New Zealanders'.*

OTHER OFFSHORE WIND FARM PROJECTS

58 Since it started advertising its offshore wind potential, New Zealand has attracted several international developers who have spent considerable effort investigating the feasibility of projects. Of those developers, some have left the country or paused their operations - citing ongoing uncertainties and lack of political willingness to support early de-risking of projects.

59 An offshore wind project can easily take over ten years from origination to construction, and require hundreds of millions of dollars invested at risk. Offshore wind investors are extremely skilled at identifying and mitigating risks, and routinely accept a measure of uncertainty as part of any development. However, risks that are unprecedented - such as those coming from attempting to develop a wind farm in the vicinity of a large-scale seabed mining project - are very hard to assess. Faced by such compounding uncertainties, many developers will consider directing their funds to other more certain offshore wind ventures and jurisdictions.

60 For example, developer BlueFloat was active in New Zealand from 2021. They left the market in 2024, citing the uncertain feasibility environment created by the overlap between TTRL's proposed seabed mining and offshore wind interests.[14]

[14] Business Desk 'BlueFloat Energy pulls the plug on NZ offshore projects' 24 October 2024.

CONCLUSIONS

61 Large-scale renewable energy is essential if New Zealand is to realise its commitments to decarbonisation and develop a sustainable economy.

62 Offshore wind farms are ideally suited to provide a reliable source of such renewable energy.

63 Considerable opportunity exists for the development of offshore wind generation facilities in the STB.

64 TOP has undertaken significant research to establish the commercial viability of its OWF Project in the STB and to assess the potential environmental and social impacts of such a development, as part of its existing feasibility study activities in the area.

65 TOP's combination of financial, technical and sustainability expertise means it is well equipped to assess the relative risks of resource developments.

66 The Proposal entails unique risks and creates a level of uncertainty that will negatively affect investor sentiment, the investment case, and ultimately the prospect of any future offshore wind development in TTRL's Proposal area and in the STB more broadly.

Giacomo Caleffi
3 October 2025