TRANSPOWER

Ministry of Business, Innovation and Employment
By email: offshorerenewables@mbie.govt.nz

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Transpower's submission to MBIE's Developing a Regulatory Framework for Offshore Renewable Energy Second Discussion Document

Transpower welcomes the opportunity to support MBIE's ongoing work to develop an offshore renewable energy industry in Aotearoa New Zealand. As the owner and operator of the transmission network, and as the System Operator, we can provide unique insights into how to support the development of new generation for the benefit of all New Zealanders.

Aotearoa New Zealand currently has an open access regime for connection to the transmission network. Transpower connects viable generation projects to the transmission grid through a transparent connection process.[1] Transpower sees the development of renewable energy as key to providing confidence of supply for electrifying the economy and meeting the Government's decarbonisation goals. Offshore wind projects, due to their size and location, raise a number of opportunities and potential challenges that should be considered during the development of MBIE's regulatory framework.

Our submission addresses several points for the electricity transmission grid and system that are important for MBIE in its consideration of how best to support an offshore renewable industry that will facilitate electrification and decarbonisation, while not placing excessive costs on NZ consumers. Our submission raises important considerations to ensure a joined-up and consistent approach to the regulatory framework.

Co-ordination of offshore wind developments can deliver efficient outcomes

Maintaining a stable and reliable transmission grid is critical in the transition towards a highly renewable and electrified economy. Due to the scale of offshore wind relative to Aotearoa New Zealand's electricity system size, power system resilience could be an issue if large scale offshore wind is concentrated in a single geographic region and is fully connected to the electricity transmission grid. The location and size of offshore wind farms may have varying potential impacts on the type of electricity transmission grid connection, capacity requirements and system requirements.

Transpower considers a combined Transpower- and developer-led model is best for the development of offshore transmission infrastructure in New Zealand. Transpower's onshore role should be extended offshore for consistency and to maintain a stable, reliable grid while allowing for optimised planning solutions. Our work on offshore wind has identified that a co-ordinated and joint approach can balance the opposing approaches and capture the potential benefits of the two opposing asset delivery models (i.e. plan-led and Transmission System Operator (TSO)-led).[2] This approach supports developers to fund and build the offshore transmission assets, and work with Transpower in the design and planning stages. This approach would leverage our combined international and local expertise and skills. Depending on different developers' route-to-market,

[1] Our connection process is publicly available on our website: Our connection process | Transpower
[2] See our study on 'Enabling offshore renewable generation' https://www.transpower.co.nz/news/offshore-energy-potential-key-contributor-aotearoas-decarbonisation-journey

some developments will be more efficient to integrate to the electricity system than others. Transpower's role in the design phase of the offshore assets should include a 'whole of transmission system' role to ensure assets are built to the appropriate standard to meet specifications and agreed service levels, and the configuration of the offshore assets is efficient.

Enabling transmission investment at pace is needed to decarbonise the energy sector

A more co-ordinated approach to inform investment decisions would drive a least cost transition and much faster – Transpower could play a role to better co-ordinate offshore wind transmission. This co-ordination is particularly relevant where there is a need to manage connections and onshore augmentation across multiple commercial parties, across different timelines, with projects of different sizes and locations.

By way of example, the Renewable Energy Zone (REZ) concept provides a co-ordinated approach.[3] A REZ could help to optimise the transmission design for meeting grid and system requirements, streamline planning and consenting while enabling investor certainty, delivering projects more quickly and at lower cost, and unlocking benefits in a region.

The fundamental principles of the open access, energy-only market has served New Zealand well to date. Accordingly, Transpower's view is that the feasibility permit should not provide an exclusive right to the permit holder to develop the connecting transmission assets.

A fit for purpose regulatory regime that enables necessary investments, including transmission investment, is needed to encourage renewable generation and electrification. In the likely scenario that the upgrade and build of new onshore and/or offshore transmission infrastructure is required, Transpower supports the position that investing too early is better than investing too late. For transmission and offshore renewable generation to both occur, a key question is what should the level and nature of commitment from offshore wind generation be that would provide the confidence to unlock investment in onshore transmission – or vice versa? Such a commitment would be vital to avoid stranded assets if projects do not proceed. Grid investment is however needed to support new generation capacity which will drive confidence in electrification. Transpower considers the transmission investment test in the Capex Input Methodology may be too restrictive for the anticipatory investment required to enable the transition. Please see our submission on this topic in our submission to MBIE's paper, *Measures for Transition to an Expanded and Highly Renewable Electricity System (Chapter 7)*.

Energy system impacts must be considered in the regulatory framework

Transpower supports the inclusion of appropriate electricity-system specific evaluation criteria in the permitting application process. It is important to identify and fully understand all the potential impacts on the grid and system operations and anticipate those requirements in the regulatory framework. Transpower is happy to work with MBIE on the assessment process and defining criteria that allow a seamless integration in the electricity grid and system.

In addition to the potential impacts on the power system, it may be beneficial to consider the potential impacts on the wholesale electricity market. The size and scale of offshore wind developments being discussed are proportionately large compared to Aotearoa New Zealand's current power system. Historically, the uncertainty concerning the potential withdrawal of the New Zealand Aluminium Smelter load, and the proposed Lake Onslow pumped storage generation project have been identified as having a dampening effect on investment. The long lead time between

[3] https://www.transpower.co.nz/projects/renewable-energy-zones

application approvals and final investment decision to the build of offshore wind generation could have a similar effect.

Consenting processes must be joined up with the offshore wind regulatory framework

We agree that the regulatory framework for offshore renewable energy should not replace or duplicate the role of consenting authorities and processes under existing legislative frameworks. However, given the grant of a feasibility permit "locks up" the area for many years, consentability should be considered at this stage. One option would be to consider whether there is an outright barrier to consenting. MBIE should also consider the potential competition issues with regard to issuing environmental permits that could lock other developers out, while balancing the need for certainty for developers who secure a permit to commit to undertaking studies and early-stage investment.

The complex relationship between the environmental approvals and permitting regimes must be joined up to facilitate quick approvals. Outside of this offshore energy regulatory framework scope, a number of timing and sequencing issues will arise due to the need to obtain environmental approvals under the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (EEZ) and the Resource Management Act (RMA), and its replacement, for offshore wind generation and its transmission connections. To overcome these issues and avoid delay in investment, we consider that wider regulatory change should be considered to streamline offshore wind projects. We consider that all necessary environmental approvals and property rights needs to be obtained in a streamlined manner – they cannot occur in a sequential manner, if shorter timeframes to generation being operational are sought. We consider there is merit in investigating a 'one stop shop' or 'common decision maker' for consenting for offshore wind generation. This approach has been used in other countries, including Denmark.

Our responses to MBIE's consultation questions are in the Appendix to this submission. Where we have no comment on a question, the question has been deleted.

Appendix: Transpower responses to the consultation questions

Chapter 4: Further detail on feasibility permits	
	Following an initial feasibility permit application round, should there be both an open-door policy and the ability for government to run subsequent rounds? If not, why not?
Q1	The feasibility permit stage is relevant to offshore electricity transmission for early-stage investigations into design, planning and consenting. We do not have a view on the feasibility permit allocation process. However, whichever process is chosen there are likely to be multiple parties seeking to develop offshore wind projects. As a regulated monopoly, Transpower provides open access connections to New Zealand's power system. This approach allows generators to request, and obtain, a connection anywhere, provided the security and integrity of the transmission grid is maintained. In considering requests, Transpower does not compare projects. However, enquiries for connecting to the grid are managed through a connection management framework. Transpower also does not sell or reserve transmission capacity on the transmission system. To drive competitive outcomes, this open access approach should be maintained, but will likely require a greater level of co-ordination of the generation and transmission investment. This co-ordination would support efficient and optimised transmission solutions for multiple wind farms that wish to be connected to the electricity transmission system, if some or all were to proceed. Transpower could play a co-ordinator role. For example, the Commerce Commission is currently considering our proposal for a holistic and multi-stage project to invest to ensure the core backbone of our transmission grid can enable the energy transition over the coming decades – our Net Zero Grid Pathways (NZGP) programme. Transpower is working with developers to undertake a joint regional connection study, covering planning of onshore transmission connection design. So far, we have delivered individual Concept Assessments for offshore wind. But there are many parties and they are looking at the same geographic location – for example, South Taranaki and Waikato. There is merit to pursuing a joint connection study with developers that considers connection options for offshore wind and onshore transmission connection design (rather than individual concept design and investigation). A joint study could consider matters such as capacity requirement, transmission voltage, and onshore landing points, including optimisation of any connections.
	What size of offshore renewable energy projects do you think are appropriate for a New Zealand context?
Q2	We do not have a view on the appropriate size of the offshore projects. That being said, we do recognise the size of the area is roughly correlated to the size of the generation, and therefore the transmission capacity required to connect to the onshore grid. For this reason, it is important to understand the potential implications on the electricity market and the transmission grid if the offshore wind farm connects to the electricity grid. For the purpose of our submission, we have assumed offshore generation will connect to the Grid, rather than directly connecting to industry (as an example). The location and size of the offshore wind farm may have varying potential impacts on the type of electricity transmission grid connection, capacity requirements and system requirements. A separate consideration would be cumulative effects under the RMA where environmental effects of two or more projects are considered. It is possible that the granting

Chapter 4: Further detail on feasibility permits	
	of one feasibility permit could preclude other proposed or future projects from developing in the broader area. We support the inclusion of electricity-system specific evaluation criteria. We are happy to work with MBIE on the assessment process and defining criteria that allow a seamless integration in the electricity grid and system. We recommend that during the feasibility stage the indicative electricity system impacts cover connection to the transmission grid. Due to the scale of offshore wind relative to New Zealand's electricity system size, power system resilience could be an issue if large scale offshore wind is concentrated in a single geographic region. To understand the potential impacts on the wider onshore electricity system, Transpower will undertake an Integration and System Impacts Study, due to commence in early 2024. This study scope will include system challenges such as system constraints, system stability issues, frequency and voltage management and potential options for resolution. The study will ensure a joined-up approach with other existing work programmes underway, such as the NZGP2 work programme, and the Electricity Authority's Future Security and Resilience (FSR) project. The Electricity Authority is currently working on updating Part 8 of the Electricity Industry Participation Code for common quality requirements (such as frequency and voltage) and may need to consider including the potential of offshore wind. Offshore wind needs to be considered as part of the Electricity Authority's current work on updating Part 8 of the Code, that apply to all parties owning offshore wind transmission assets.

Chapter 5: Commercial permits	
	Should there be a mechanism for government to be able to compare projects at the commercial stage in certain circumstances? If yes, would the approach outlined in Option 2 be appropriate or would there be other ways to achieve this same effect?
Q4	We do not have a view on the non-comparative or option to compare process. As MBIE notes in the paper, the regulatory framework criteria will need to ensure that such an assessment does not duplicate existing market functions or processes. Specific to electricity transmission, Transpower does not consider that duplication of this assessment process is required if the offshore wind farm is to connect to the onshore transmission system. We propose that the regulatory framework sits alongside existing processes, rather than seek to duplicate and add further complexity and time to decisions on transmission connection processes. Transpower has in place existing processes to accommodate connection of large-scale electricity generation and load, including offshore wind. This process can provide the confidence to MBIE that developers are financially and technically able to deliver their projects.
	Are the proposed criteria appropriate and complete? If not, what are we missing?
Q5	We support the inclusion of energy-system impacts. We strongly support inclusion of electricity-system specific evaluation criteria at the commercial stage and offer to work with MBIE and the Electricity Authority on the assessment process and defining criteria that allow for a seamless integration with the electricity grid and system. As discussed in response to question 19, we consider that consentability should be a criterion.

Chapter 5: Commercial permits

Is 40 years an appropriate maximum commercial permit duration? If not, what would be an appropriate duration?

Q7

MBIE may need to consider the appropriate maximum commercial permit duration to ensure this is relevant to the appropriate transmission infrastructure (e.g. if the assets require upgrade, replacement etc). For example, the current HVDC subsea cables between the North and South Island were installed in 1992 and are expected to be replaced by 2032, a lifetime of approximately 40 years.

As discussed in response to question 18, the time taken to obtain all necessary environmental approvals and property rights could be lengthy. We consider that the duration of any commercial permit should take into account these associated timeframes. A 40-year duration for a commercial permit may not be long enough if environmental approvals and property rights are obtained after any commercial permit.

Some undersea electricity infrastructure may have an enduring role beyond the life of the offshore windfarm which may need to be factored into the regulatory framework (as it is with the HVDC cables and their cable protection zone).

Should a developer that wishes to geographically extend their development be required to lodge new feasibility permit and commercial permit applications? Why or why not?

Q8

We consider that a new application should be made if there is a material change to the generation capacity, or a repowering of the wind farm. Changes of this kind are likely to require consequential changes to transmission assets or require upgrades to existing grid capacity.

If non-material changes are proposed, a variation to existing permits may be appropriate.

Q9 **Would the structure of the feasibility and commercial permit process as described enable research and development and demonstration projects to go ahead? If not, why not?**

MBIE is proposing that the transmission infrastructure should be part of the main commercial permit. This proposed approach would allow the holder of the commercial permit an exclusive right to construct both the turbines and the associated transmission infrastructure. This scope is based on the need for generation and transmission infrastructure to both be progressed.

The award of a commercial permit does not guarantee the holder a right of access to the transmission grid. Rather, Transpower would need to be involved in developing the connection to the grid on the design and location of that offshore transmission infrastructure. Transpower is able to work with and support developers and permit holders to ensure offshore wind farms are able to connect to the New Zealand electricity system as part of our existing customer connection process. The offshore transmission infrastructure design and build will need to meet certain standards and specifications, and configuration of the transmission solution is optimised and efficient to minimise the cost to consumers.

Further points that may need to be considered include:

- The components of the transmission infrastructure included or excluded in the scope of the commercial permit. This scope will need to be carefully defined (e.g. subsea

Chapter 5: Commercial permits	
	cables, HVDC/HVAC connection, offshore substation, onshore substation and other components). • How opportunities for joint connection infrastructure would be realised, and shared between different commercial permit holders who have exclusive rights for transmission build. There may be competing interests and drivers – how would these be resolved in a way that ensures the build is efficient and cost for consumers is minimised? • If the offshore wind project seeks to connect to the onshore grid, how will the wind farm, offshore and onshore transmission build be co-ordinated and sequenced? For example, what should be the level and nature of commitment from offshore wind generation that would provide the confidence to invest in onshore transmission – visa versa? We have submitted on the *Measures for Transition to an Expanded and Highly Renewable Electricity System* (Chapter 7), supporting our position that investing too early is better than investing too late.

Chapter 7: Māori Rights and Interests and Enabling Iwi and Hapū involvement	
	Is there anything you would like us to consider as we engage with iwi and hapū on Māori involvement in the permitting regime?
Q14	We support MBIE's approach to engage directly with iwi and hapū to ascertain their concerns and aspirations for offshore wind development. We are aware of the potential for commercial and business opportunities for iwi and hapū on Māori, such as partnerships and joint venture arrangements. These arrangements are appropriate for offshore wind that are developed by commercial entities. However, Transpower's regulatory regime prevents such arrangements in relation to core transmission assets.

Chapter 8: Interaction with the environmental consenting processes	
	For each individual development, should a single consent authority be responsible for environmental consents under the Resource Management Act 1991 and the and Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012? Why or why not?
Q17	MBIE raises the potential for a single consent authority to administer all environmental consents for an offshore wind development. We consider there is merit in investigating a 'one stop shop' for consenting for offshore wind generation which has been used in other countries, including Denmark. Our primary reason for considering a single consent authority to be required is due to timing and efficiency issues, as we discuss in response to question 18.
Q18	**Do environmental consenting processes adequately consider environmental effects such that it is not necessary to duplicate an assessment of environmental effects in the offshore renewables permitting regime?**
	Yes. The regulatory framework for offshore renewable energy should not replace or duplicate the role of consenting authorities and processes under legislative frameworks.

However, a number of timing, sequencing and substantive issues will arise under the EEZ and RMA for offshore wind generation and associated transmission. In order to overcome these issues, wider regulatory change should be considered that:

- amends the EEZ and RMA to enable offshore and onshore applications to be heard together. Consideration should also be given to whether the commercial permit could also be considered at the same time (with a recommendation given to the Minister);
- strengthens the national direction that applies to generation and transmission (by amending the National Policy Statement on Renewable Electricity Generation (NPS-REG) and National Policy Statement on Electricity Transmission (NPS-ET) or creating new national direction for broader offshore wind projects) and reconciles the national direction with the New Zealand Coastal Policy Statement and National Policy Statement on Indigenous Biodiversity (NPS-IB). Without these changes, environmental bottom lines and/or policy barriers could result for offshore wind and associated onshore assets;
- amends the Public Works Act – currently Ministerial practice is for compulsory acquisition to be initiated after environmental approvals have been obtained. This practice should change. Further, there should be the ability for compulsory acquisition applications to be considered at the same time as environmental approvals (under the RMA and EEZ) and commercial permits. Further, changes may be needed to the Public Works Act and/or Electricity Act to provide a compensation regime, rather than an authorisation regime (as currently). These changes would allow works to proceed, while the quantum of any compensation was determined at a later date.

Note that the issues we raise in relation to barriers are not limited to offshore renewable energy and apply to onshore development of renewables and transmission. However, the impact of the EEZ legislation and proposed permitting regime adds another layer of complexity.

Should the offshore permitting regime assess the capability of a developer to obtain the necessary environmental consents? If not, why not?

Q19

No. The offshore permitting regime should not assess the capability. However, consentability should still be considered at the feasibility stage.

For the regulatory framework for offshore renewable energy, one option for considering consentability at the feasibility stage would be to consider whether there is an outright barrier to consenting, such as the project being contrary to the New Zealand Coastal Policy Statement or other National Policy Statement, or contrary to a customary marine title under the Marine and Coastal Area (Takutai Moana) Act, where the title holder has not provided its agreement. This approach has been taken in the COVID-19 (Fast-track Consenting) Act 2020 and fast track processes under the Natural and Built Environment Act 2023. This approach would not be intended to replace or duplicate the role of consenting authorities and processes under legislative frameworks.

Q20

What is the optimum sequencing between obtaining feasibility permits, commercial permits and relevant environmental consent(s)?

Chapter 8: Interaction with the environmental consenting processes

The discussion document raises the sequence of obtaining commercial permits and environmental approvals. In our view, the approach to obtaining commercial permits, all necessary environmental approvals and property rights needs to occur in a streamlined manner – it cannot occur in a sequential manner if shorter timeframes are sought.

The intention under the regulatory framework for offshore renewable energy is for commercial permits to be granted for 40 years. However, a significant amount of this time could be taken with obtaining environmental approvals (under the EEZ and RMA) and obtaining property rights. By way of example, Trans-Tasman Resources Limited applied for a marine consent and marine discharge consent under the EEZ to extract and process iron sand off the south coast of Taranaki. The initial application was lodged in 2016 – after years of litigation, including to the Supreme Court, the applications are currently being reconsidered by a panel appointed under the EEZ. It is not only offshore assets that are subject to challenge due to their impacts on the coast environment. The New Zealand Transport Agency lodged applications for its East West Link project in 2016 – a Board of Inquiry confirmed the applications – which have since been subject to appeal. A Supreme Court decision is yet to be delivered in relation to the latest legal challenge.

These projects are illustrative of the challenges that can be made to projects under the EEZ and RMA. They also illustrate the time that could be lost should a commercial permit be granted before consents for a project are obtained. Transpower is unsure whether a party would want to pursue environmental approvals through the Courts if there was no certainty that a commercial permit would be forthcoming.

Are there are any other matters about the environmental consent regimes that you think need to be considered in the context of the offshore renewable energy permitting regime?

Q21

Cumulative effects are considered under the RMA, and it is possible the granting of one feasibility permit/commercial permit would have the effect of precluding offshore wind development in the broader area.

The owner of the subsea transmission assets may require an exclusion zone with the associated on-going monitoring, protection and policing, similar to the HVDC cables.

How should the factors outlined influence decisions to pursue offshore renewable energy developments in the Exclusive Economic Zone or the Territorial Sea? Are there other factors that may drive development in the Exclusive Economic Zone versus the Territorial Sea?

Q22

See our response under Question 19.

Chapter 9: Enabling transmission and other infrastructure

Are the trade-offs between a developer-led and a TSO-led approach, set out above, correct? Is there anything missing? What could we learn from international models?

Q23

Transpower has undertaken research into the various wind generation and transmission asset delivery models – see Transpower's '*Enabling offshore renewable generation*' study (available on our website). The study covers the main approaches sitting at either end of a spectrum that MBIE has included in its paper – plan-led (centralised) and developer-led

(decentralised). Under both models the developer is responsible for the offshore wind turbine generation assets.

There are also a wide range of international examples of 'hybrid' models that combine aspects of the developer-led and plan-led delivery models. Often this variety reflects the specific contextual requirements of each jurisdiction. In New Zealand, being a small, islanded country with a relatively modest electricity system, a Transpower-led approach can help address any concerns about lack of co-ordination with offshore wind farms, onshore impacts on the security and reliability of the New Zealand electricity system and cost to consumers from an inefficient build. A developer-led model allows previous experience from developers who have delivered offshore transmission project to be drawn upon, which may help to accelerate project development and provide confidence to their investors in new offshore wind markets, like New Zealand.

The fully plan-led and developer-led models provide two opposing approaches. Both approaches have their own benefits and drawbacks. In practice, hybrid models that combine aspects of the developer-led and plan-led delivery models are typically taken internationally – to better align the overall approach adopted with the contextual requirements of the country. Transpower's view is that a **combined Transpower- and developer-led model** is best for the development of transmission infrastructure of offshore wind in New Zealand. This approach would allow developers to fund and build the offshore transmission assets, partnering with Transpower in the design and planning stages that would leverage our combined international and local expertise and skills. This co-ordinated and joint approach balances both the risks but captures most of the perceived benefits of a fully developer-led and fully TSO-led model. For example, our initial integration studies show there is benefit in coordinating the development of offshore wind across the whole electricity system. Depending on the developers' route-to-market, some developments will be more efficient to integrate to the electricity system than others. In some cases, offshore transmission infrastructure would also have a broader support role for electricity transfer across the national grid.

The appropriate grid delivery model for the New Zealand context should be considered from the perspective of what is likely to promote the best overall socio-economic outcomes – i.e. what works best for developing offshore wind opportunities overall. Consideration should be given to the grid connection (e.g. cost and timely delivery), but also the perspective of ensuring risk and cost to consumers is minimised.

Which party do you think should build offshore connection assets? Can existing processes already provide the flexibility for this to be carried out by the developer?

Q24

Transpower is well positioned to continue its role as the natural owner and operator of the national transmission grid. It is important for Aotearoa New Zealand to maintain an efficient, secure and reliable national electricity system and maintain consistency between the approaches taken for transmission both onshore and offshore. Despite offshore wind having longer lead times compared to other renewable electricity generation technologies, we consider there should be consistency with existing onshore practices, including an open access regime, and transmission capacity not being reserved or sold. These practices should apply universally across both onshore and offshore.

Should investor's in offshore wind generation seek to connect to the national transmission grid, Transpower's preference remains to own the offshore transmission assets. Transpower's role should be incorporated into the regulatory framework. Transpower

supports developer(s) funding and building offshore transmission assets, provided Transpower is involved in the design and planning of the offshore grid to:

a) ensure the assets are built to the appropriate standard (and agreed service levels); and

b) the configuration of the offshore assets is efficient.

Transpower is well positioned to own and operate offshore transmission infrastructure that connects offshore renewable energy wind farms. For example, Transpower presently owns and operates an HVDC link between the North and South Islands. This link comprises 3 HVDC subsea cables and a range of supporting infrastructure such as cable termination stations on each island and converter stations at either end of the HVDC link. These assets are highly specialist in nature and Transpower has a long history of reliably maintaining HVDC assets and subsea infrastructure. Transpower first installed HVDC submarine cables in 1964, at that time they were the largest subsea power cables in the world. Since then, we replaced these cables in 1992, and are now undertaking an investigation to replace these cables by 2032, due to end of life. We expect to undertake this replacement work using a mixture of internal and external expertise.

To support the on-going management of these cables, we have internal capability and key external suppliers that enable us to undertake annual inspections on the cable that include electrical testing, scuba diving and Remotely Operated Vehicle (ROV) inspections which help inform on-going maintenance programs. We hold key spares in a specially built facility in New Zealand and have contracts in place with key suppliers that enable us to respond quickly in the event of a serious cable fault. During our time owning and operating these cables, we have undertaken one significant repair, in 2004, due to a fault on one cable. Specific experience in managing our offshore/submarine assets include investigating and implementing suitable contracted operations. Currently, these include:

- Establishment of the cable protection zone (CPZ) across Cook Strait
- Operation of 24/7/365 maritime surface patrol
- Management of submarine assets including regular cable TDR testing and bathymetry measurement of cable/seafloor
- Provision of Scorpio workclass ROV annual inspections of the cables, and routine practice exercises for emergency repairs
- Provision of spares and retention of cable repair ship capability
- Development and testing of cable intervention tooling with submarine partners to effect cable cut/cap.

This expertise will be useful for offshore wind transmission assets.

Figure 1: 4 images of submarine cable cut and cap

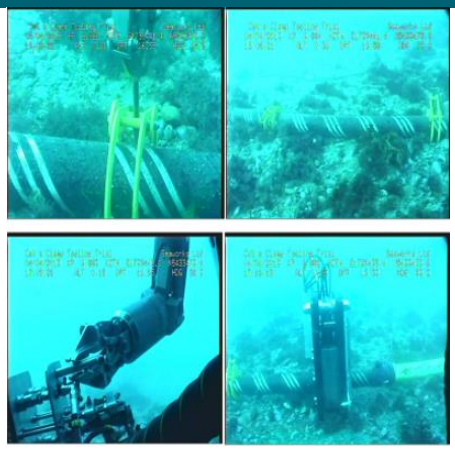

Figure 1

Figures 2 and 3: HVDC cable laying vessels and equipment

Figure 2

Figure 3

In addition to subsea infrastructure, Transpower has experience with other assets in a marine/aquatic environment and presently manages a number of steel lattice towers and foundations across New Zealand that are situated in inlets/estuaries/foreshore, harbours and lakes which require a range of asset management skills such as consenting, stakeholder engagement and the technical delivery of work. Examples of these assets include the towers in Lake Karapiro, Tauranga Harbour and to New Zealand Aluminium Smelter.

If developers were to fund and build offshore transmission assets, they would ultimately need to be transferred to Transpower (should Transpower be designated as the owner and operator). A clear asset ownership transfer process needs to be contemplated in any legislation and/or the regulation.

This process would provide increased certainty and confidence at the outset, for both the design, build, transfer and operation of the assets. To date, Transpower has used a commercial process and form of contract that enable customers to build certain connection assets and define the conditions for their ownership to be transferred to Transpower on commissioning. This commercial process is based on a sale and purchase agreement process but is executed alongside the Transpower Works Agreement (i.e. a contract that determines how work is to proceed, including ownership demarcation of assets). However, the asset transfer requirements and obligations for offshore wind will likely be different than those for onshore assets (including at significant value).

Some required transmission infrastructure may be or become interconnection assets and not directly funded by developers but recovered as per transmission pricing and regulatory processes for major new grid investment.

Significant input from Transpower is needed from the start to gain the necessary assurance that the design and build will meet Transpower standards and will deliver the expected performance.

International Example: Offshore Wind in Ireland

Ireland is designing a regulatory regime to support offshore wind, including a framework on the regulatory treatment of offshore transmission assets.[4]

The Irish Government has appointed EirGrid (Ireland's TSO) as the asset owner and operator of Ireland's offshore transmission network in the long term. Under this regime, an asset transfer framework is being developed where there is the option to transfer ownership of the offshore transmission assets from the party who constructed, to one who will bear responsibility for operations and maintenance and decommissioning. The key principles of the asset transfer process to be implemented in Ireland include:

- **Asset gateway process:** Asset transfer will be progressed through a set of sequential gateways that must be met before asset ownership can transfer to EirGrid. There will be an 18-month proving period, post construction where EirGrid and the Developer will work together to achieve asset transfer. For example, under Asset Design, the regulatory authority expects developers and EirGrid to work together constructively to ensure that the designs used for procurement purposes meet the technical and operational requirements for integration into the transmission system.
- **Asset valuation**: The assets will undergo a Post Construction Review (PCR) by the regulator ahead of asset transfer in order to value the assets efficiently, saving costs to consumers. This PCR includes a forensic accounting review and a technical assessment in order to answer two questions – 1) does the creation of the offshore transmission assets follow good industry practice; and 2) are the costs incurred economic and efficient and correctly allocated against the cost categories. EirGrid will pay the Developer an Asset Transfer Value (ATV) for the offshore transmission

[4] Commission for Regulation of Utilities, Offshore Grid Connection Asset Treatment

assets upon transfer of ownership, which will be determined via the Post Construction Review (PCR) separate to the asset transfer process.

- **Asset payment mechanism**: The approach requires Developers to pay back the asset transfer value to EirGrid over the life of the assets. Payments are made through an offshore generator transmission use of system charge mechanism, which will apply to generators' use of the offshore grid connection assets (for example, using a Transmission Use of System recharge mechanism over a cost recovery period). This process takes advantage of EirGrid's lower cost of financing these assets and, therefore, reduces the cost to the consumer.

Should an international model be adopted, it would likely need to be altered to be fit for purpose for Aotearoa New Zealand, including Transpower's dual roles. Consideration of the existing electricity transmission cost allocation / pricing, market, regulations, and policy settings will need to be further explored.

Q25 **What are the potential benefits and opportunities for joint connection infrastructure? Do you agree with the barriers set out and how could these be addressed?**

Co-ordination is required to unlock opportunities for transmission infrastructure both offshore and/or onshore in order to drive a least cost transition. Transpower could play this co-ordination role.

In our study *'Enabling offshore renewable generation'*, Transpower identified that offshore wind generation could be more easily accommodated on the onshore transmission system if there was responsive load. Our finding was that the greater the load, the greater the potential to connect offshore wind generation.

Joint onshore infrastructure is important as it may also benefit onshore generation resources. A variety of onshore infrastructure developers could also affect the ability for transmission and distribution owners to develop their networks due to corridor congestion or public objections.

For onshore connections, we have significant experience in joint connection infrastructure for transmission networks. However, barriers that MBIE has identified, including confidentiality and commercial sensitivities and timelines needing to align to avoid delivery and financial risk for the counterparties mean there are few public examples. One example is our project to redevelop our Waiotahe substation in Eastern Bay of Plenty to allow the connection of new solar generation nearby. Two commercial parties are planning to build separate solar farms and were able to reach an agreement for shared connection assets, resulting in a lower and more efficient solution, than had they acted alone. The key driver in this example was the addition of load to the project from the local Electricity Distribution Business (Horizon Networks) which created the opportunity to share costs and benefits across multiple parties.[5]

For offshore renewable energy, Renewable Energy Zones (REZ) are one framework that could address commercial sensitivities, misaligned timeframes and first mover disadvantage highlighted by MBIE. A REZ could provide greater co-ordination and speed up generation, load and transmission investment. While it is beneficial to leverage the learnings and insights from other overseas examples, any REZ concept for Aotearoa New Zealand must fit our

[5] https://www.transpower.co.nz/projects/waiotahe-substation-redevelopment

circumstances. Transpower would not suggest that the REZ models used within Australia's National Electricity Market are transplanted into Aotearoa New Zealand.

A REZ is a change in approach to the planning and investment in renewable electricity infrastructure. It takes a more co-ordinated approach to planning generation and transmission build. A REZ therefore avoids the co-ordination issues that can lead to a 'chicken and egg' situation where network providers will not commit to building new infrastructure until there are firm commitments from generators, and generators will not invest unless they know there is commitment to build the network. In this sense, a REZ solves this problem by forcing commitment from generators which allows transmission planning to progress.

It is important to note the proposed REZ framework does not change fundamental principles of the open access, energy-only framework. Firstly, while the REZ framework ensures sufficient transmission build to support generation capacity, it does not guarantee dispatch into the wholesale market. Secondly, while connection access to the REZ is managed in a coordinated way, it does not stop competition for access – indeed it may enhance competition as it will create an easier connection process for international investors not familiar with the New Zealand grid connection or consenting frameworks. In this sense, the open access regime is maintained.

Q26	**Do you agree with the representation of the timeline challenge for onshore interconnection assets? What opportunities might there be to front load planning work for interconnection upgrades? What role do you see for the developer in this?**

We agree. However, the issue of the lead timeframes for transmission infrastructure to enable electrification and decarbonisation at pace is not unique to onshore interconnection. It is universal across both onshore and offshore and applied to any generation or load connection to the transmission grid which requires interconnection upgrades.

Other measures to progress early approvals processes such as front loading the planning (for interconnection assets) may not fit with the competitive open access regime. Planning will benefit all renewable energy generation or load that wishes to connect, not just offshore wind. For example, anticipatory investment in interconnection assets will not be able to provide offshore wind developers a guarantee on capacity to market. There are substantial onshore resources in the Taranaki region that will also benefit from the same interconnection upgrades, and these could potentially be developed faster than offshore wind and at a lower long-run marginal cost. Onshore interconnection upgrades to allow export of offshore wind from a region would also unlock capacity for onshore generation in the same region. Therefore, any interconnection planning needs to be available for all parties interested in generation development within the respective region. This approach would make it incompatible for offshore wind developers to fund interconnection planning.

However, there is scope to fund connection studies by developers between the feasibility and commercial permit stages. See question 1 for further discussion.

Chapter 10: Decommissioning

Q31	**What should the developer be required to provide in relation to decommissioning at the feasibility application stage?**

There are a number of 'triggers' for disposal decisions, including poor condition assets that have been replaced, changes to safety or environmental standards or changing demand for the asset. We would be interested in working with MBIE on this process, given the potential for Transpower to own and/or operate the offshore transmission assets and our policy on decommissioning of transmission assets.