TRANSPOWER

Renewable Energy Zones

National Consultation

2022

Are Renewable Energy Zones right for New Zealand?

Contents

1.0 Purpose of this consultation document

The purpose of this consultation is to seek feedback from interested parties on the potential for developing Renewable Energy Zones (REZs) in New Zealand to enable the high volume of generation development interest in areas of the electricity network – both transmission and distribution – that do not currently have adequate spare capacity.

At the same time, Transpower, Top Energy and Northpower are also seeking feedback on the concept to collaborate in developing a Northland REZ as a first pilot in New Zealand.

Defining the term Renewable Energy Zone (REZ)

A Renewable Energy Zone is a location of investment, at the edges of an interconnected electricity grid, to enable renewable electricity to power more homes, community facilities and businesses.

In a Renewable Energy Zone, multiple generators or major electricity users agree together to co-locate to enable cost-effective investments in electricity infrastructure.

The purpose of these investments in any one zone can be

- to bring new renewable generation onto the grid,
- to help large industrial energy users connect into the grid and electrify their operations, or,
- a combination of the above.

Transpower is exploring the concept of Renewable Energy Zones for New Zealand

Transpower has taken initial steps to understand the potential for REZs, following indications from our customers and potential investors that some areas on the edges of the National Grid have high potential for generating electricity from wind, geothermal and solar.

Due to particularly strong customer interest in Northland, we have also started to test, in partnership with Northpower and Top Energy, the feasibility for a REZ in Northland. It is a region where the demand from developers to build more renewable generation, and therefore the increase in electricity that may need to be transmitted through the area, significantly outstrips available capacity on the existing electricity network at both the transmission and distribution level. It is also an area where large quantities of new renewable generation can be enabled by small incremental network investments, primarily through upgrading existing assets.

In this paper, we share our initial findings on the potential for REZs, the benefits they might bring to New Zealand, and how they could be developed. In the related paper *Renewable Energy Zones – Northland Pilot Concept*, we outline investigations that Transpower, Top Energy and Northpower have made into developing a pilot REZ in the Northland region.

Topics covered include the challenges spanning regulation, commercial and technical domains that may need to be overcome to develop a REZ. In addition, there are other aspects of REZs, such as the impacts on environmental, social and economic outcomes to consider and carefully work through.

Transpower is seeking your feedback

We are seeking feedback on the **concept** of Renewable Energy Zones and welcome input from a wide range of stakeholders – from central and local government, regulators, generation developers, distribution businesses, industry, electricity consumers, iwi, hapu, communities and other interested parties.

If this concept gains interest, then targeted community engagement and consultation for specific Renewable Energy Zones and the projects within them, would be an important step ahead of any development. This engagement would be expected to take place once more specific detail on locations was decided. The Northland Pilot Concept consultation includes opportunities for the communities of Northland to engage with the REZ concept at a local level.

In this consultation, we would like your feedback to:

1. Test whether Renewable Energy Zones could be one part of the activities to support New Zealand to meet its carbon budget targets and net zero carbon goals.
2. Discuss and hear views about how New Zealand should make decisions about Renewable Energy Zone investments, and how we might navigate potential regulatory challenges, as this is something the industry will need to explore and resolve collaboratively.
3. Understand the interest from potential collaborators. If we do progress with exploring REZs further, it will be a challenge that needs to be tackled by several parties and not just by Transpower and electricity distribution businesses. As the grid owner and operator, Transpower will have an enabling role to play, but we can't do it alone.

Finally, we are seeking feedback from Northland stakeholders on the potential for a Northland Renewable Energy Zone to pilot the concept in New Zealand. The related paper *Renewable Energy Zones – Northland Pilot Concept* shares specific details and seeks your views on this. It can be found at www.transpower.co.nz/REZ.

Based on your feedback, and if there is enough interest, we will seek to partner and collaborate with different stakeholders to progress with REZs further. Transpower, Northpower and Top Energy would also proceed with the Northland REZ pilot, if there is support for it.

2.0 Context

2.1 New Zealand's low carbon energy future

In Transpower's 2020 report *Whakamana i Te Mauri Hiko - Empowering our Energy Future*[1] we identified that New Zealand needs to rapidly decarbonise its energy use to meet our net zero carbon targets. This was echoed in *He Pou a Rangi*[2] - The Climate Change Commission's June 2021 advice to Government.

Significant progress can be achieved through increasing the proportion of our electricity generated by renewable resources, and widespread electrification of our transport, process heat and buildings. In Whakamana i Te Mauri Hiko we estimated that the proportion of New Zealand's electricity generated by renewable resources could reach around 95% by 2025 and electricity demand could grow 50-70% by 2050. To achieve this, New Zealand will need more renewable electricity generation capacity in the system.

As grid owner and operator, part of Transpower's role is to understand how the transmission network might need to change to accommodate and enable this low carbon energy future. Our studies suggest we may need approximately 70 new grid scale connections to connect new generation and major electricity users, as well as several grid upgrades by 2035 to grow capacity in the transmission network.

1. https://www.transpower.co.nz/resources/whakamana-i-te-mauri-hiko-empowering-our-energy-future
2. https://www.climatecommission.govt.nz/our-work/advice-to-government-topic/

2.2 Transpower's work to enable decarbonisation

Part of the work we are doing to enable the decarbonisation of energy is already underway through our Net Zero Grid Pathways (NZGP) programme, which covers investments on the backbone of the electricity grid to 2050. These investments will ensure the interconnected grid backbone has enough capacity to accommodate new renewable generation, enable the secure and reliable flow of electricity to energy users, and ultimately enable the electrification of the economy to meet our nation's decarbonisation targets.

To understand where new capacity and investments on the grid will be needed, Transpower has asked generation investors and electricity customers to indicate areas of future growth and investment. This, along with our modelling and existing customer enquiries for new connections, has indicated priority areas for investment on the grid backbone.

We are also thinking about the experience new generation or large electricity users have as Transpower connects them to the grid. These types of projects are generally called connections[3]. We are well underway with improving and streamlining our connections process to make it easier for new generation and electricity users to connect. We have also been exploring ways to efficiently process increasing volumes of enquiries, and to deliver the most efficient outcomes for the grid and customers.

As part of our various programmes of work, we have identified areas of New Zealand that could be suitable for renewable generation development based on renewable resource availability and high levels of generation investor interest; but investment in these areas could potentially be limited by the funding and regulation models for developing enabling transmission and/or distribution infrastructure.

Generation investors are not the only ones that can be limited by transmission funding and regulation models. We know there is interest from industry wanting to either electrify existing processes (e.g. move from heat created by coal to heat created by largely renewable electricity), or to build new industrial plants that are powered by renewable electricity (e.g. data centres or hydrogen). Part of Transpower's role is to enable these kinds of businesses to directly connect to the grid and further support the decarbonisation of industry in New Zealand.

3. In this paper, we define connection and interconnection assets broadly. The proposed *Transmission Pricing Methodology* defines whether individual assets are classed as connection or interconnection assets.

2.3 Growing interest and the barriers to greater use of renewables

Recently, through our NZGP programme, we have started exploring ways in which Transpower can better respond to our generation or demand customers who are seeking to connect to the national grid (or to connect to the electricity system via distribution networks) but are inhibited by the first mover disadvantage[4] or very high connection costs. These are typically the customers seeking to connect in parts of the transmission grid that currently have limited available capacity. Transpower is receiving large volumes of connection enquiries of this nature from customers.

Furthermore, during our NZGP consultation, responders told us that there is about 11GW of wind and solar generation that investors are considering building over the next 30 years. Of this, 6GW can be enabled by normal market mechanisms and Transpower's streamlined connections processes. The remaining 5GW of this potential generation is in regions where it is difficult to connect to the grid due to the first mover disadvantage and high connection costs.

Renewable Energy Zones, a model used overseas, have emerged as a potential mechanism to help to enable this generation. Broadly speaking, a Renewable Energy Zone is a cluster of renewable generation connecting to the local network via shared transmission or distribution network infrastructure. In their *Draft New Zealand Infrastructure Strategy*, the New Zealand Infrastructure Commission Te Waihanga also identified REZs as an area of focus to support moving towards a low-emissions energy sector.

Similar models exist such as 'industrial clusters', where several large electricity users (such as electrified process heat, manufacturing or data centres) connect to the network via a shared connection. There are also 'renewable energy industrial clusters', where electricity users are co-located with renewable generation. This enables the electricity users to take advantage of lower cost electricity due to decreased transmission costs.

The process of developing a REZ (and similar models) overcomes some of the challenges around the first mover disadvantage. The commercial funding model of a REZ has the potential to enable lower connection costs to individual generators because costs are shared, and because of the potential for economies of scale. We elaborate further on how REZs could benefit the electricity system later in this paper.

4. First mover disadvantage is discussed in more detail in section 2.4.

2.4 The transmission system and current connection challenges

To understand how Renewable Energy Zones could support the development of more renewable generation, it is important to understand the fundamentals of how the transmission grid is developed and existing challenges in the framework that face generators and large electricity users seeking to connect.

New Zealand's electricity grid is made up of two main types of transmission assets: interconnection and connection. Both types are generally made of the same components (lines and substations) but their purpose and function vary. Figure 1 shows how these asset types make up the transmission grid. In the following sections, we outline the key distinctions between connection and interconnection assets. While the following definitions are broadly true for most transmission assets, whether an individual asset is a connection or interconnection is defined by the *Transmission Pricing Methodology*.

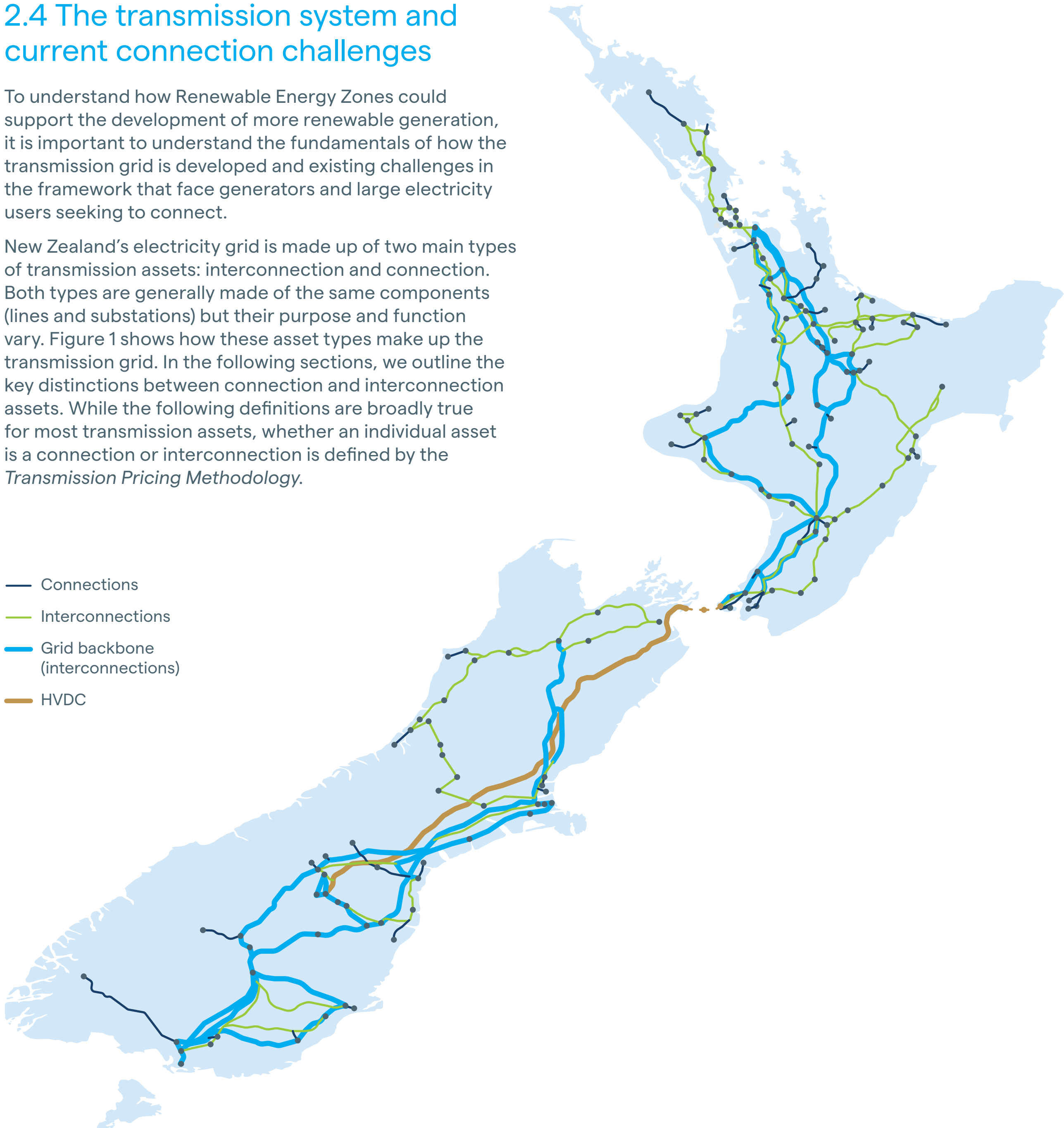

Figure 1: Map of New Zealand transmission grid

Interconnections enable the flow of electricity from supply to demand

As shown in Figure 2, **interconnections** are transmission assets that enable the secure flow of electricity from many generators to many electricity users (many to many). As such, most of Transpower's interconnection assets form the core grid backbone, shown in Figure 1.

Transpower typically invests in new or upgraded interconnections when the anticipated flow of electricity from one area of the grid to another will be greater than what the current network provides or to support grid security and reliability.

For new interconnection projects that cost less than $20 million, costs are recovered from an envelope of 'base expenditure' that is approved by the Commerce Commission. Investments in new interconnection assets over $20 million, however, require Major Capital Project (MCP) approval from the Commission. For these, Transpower applies the *Investment Test*, as prescribed under the *Capex Input Methodology (Capex IM)*, which is a cost-benefit analysis that identifies the option with the highest long-term net benefit to electricity consumers.

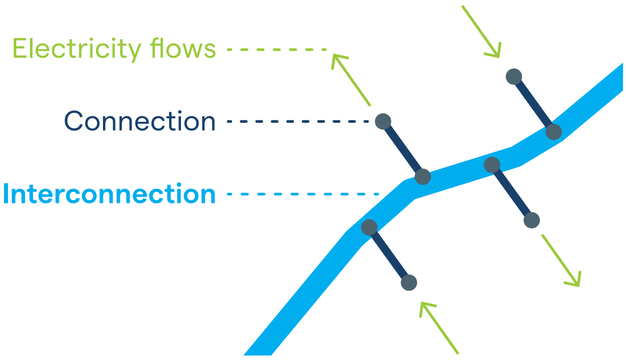

Figure 2: Interconnection configuration

The *Investment Test* also includes the ability to invest in the grid to enable access to lower cost generation on the interconnected grid, based on existing commitments and forecast generation expansion identified in the Ministry for Business, Innovation and Employment's Electricity Demand and Generation Scenarios.

Interconnection grid upgrades have been the focus of the NZGP programme to date. For more information see www.transpower.co.nz/NZGP.

Connections connect electricity suppliers and users to the grid

Connections are the transmission assets that enable generators to feed electricity into the grid and users to draw electricity from the grid.

Connection assets tend to exclusively serve one customer (one to grid, or grid to one) or a group of customers (many to grid or grid to many), as illustrated in Figure 3.

Currently, the vast majority of Transpower's connections are one to grid (e.g. a single windfarm connecting directly to the grid), or grid to one (e.g. a single large industrial user taking electricity directly from the grid, or a single distribution network connecting to the grid).

Connections typically arise when a party approaches Transpower to build a connection because they are either building new large-scale renewable generation or electricity load. If Transpower and the connecting party proceed with investing in a connection, the connecting party will pay the upfront capital costs. In instances where a party may seek to significantly upgrade an existing connection asset, that party will cover the incremental cost of the upgrade.

Because the connecting party pays for the transmission connection, the party will often only connect if, one, there is existing capacity available on the relevant parts of the interconnected grid and, two, the cost to build a connection and the charges for using the interconnected grid (under the TPM) are affordable. This is typically more likely in locations close to the grid backbone.

There are other areas in New Zealand where there is good renewable resource such as wind and/or solar, but the transmission grid or distribution network in that area is constrained or would be constrained should additional generation be injected at that point. This typically means that the cost of connecting and upgrading additional network sections to ensure that generation assets can be used to their full potential will be significant, which can be a deterrent to generation investors.

Transpower has seen this in practice, where we have had several generation developer enquiries seeking to connect to parts of the grid that have limited transmission capacity and these developers decide not to progress further due to it being too expensive for a single party to cover the costs of connecting. However, if multiple parties could coordinate effectively to connect to these parts of the network, via many to grid or grid to many connections, it could be a very economical solution.

Figure 3: Simple connection configurations

Currently, many-to-grid and grid-to-many connections are few. Part of the reason for this is because of the first mover disadvantage that arises under funding and charging mechanisms and the challenges that arise with independent parties co-ordinating together to develop a joint solution, even where it would be more efficient to coordinate investment in joint transmission. If these challenges could be mitigated, we could expect to see more many to grid and grid to many connections in the future.

Two challenges have been highlighted that we think could be addressed by Renewable Energy Zones: first mover disadvantage and high connection costs.

What is the first mover disadvantage?

The first mover disadvantage arises in a situation where the first customer incurs the full costs of a larger asset and bears the risk of subsequent customers not eventuating or not being able to recover costs from subsequent customers.

For example, consider a case where a dairy company wants to electrify its plant (with capacity X) in 2022 and a local meat works is planning to electrify its site (with capacity Y) in 2026. The optimal size for the transmission line would therefore be X+Y and the cost would be shared between the two companies. However, for us to build a line with X+Y capacity all parties are presented with two key challenges:

- who pays the meat works' share of the costs before they connect and how does that party recover the costs from the meat works to avoid a free-rider situation?
- who carries the risk that the meat works changes its mind and opts to not connect in 2026 meaning no part of the incremental cost of the increased connection capacity is recovered from the meat works?

Another example would be building a long transmission line to an area with high quality wind resource which may not be affordable for one wind farm developer to pay the full connection cost. However, a consortium of wind farms may be able to economically share the connection costs of a larger connection, but this requires coordination between parties competing for the same resources.

REZs can be a potential solution in some but not all instances where the first mover disadvantage arises. The TPM consultation being completed by the Electricity Authority seeks to create clarity on how first mover disadvantages are managed.[5]

5. https://www.ea.govt.nz/development/work-programme/pricing-cost-allocation/transmission-pricing-review/

Questions

Q1.

Do you agree that the first mover disadvantage and high connection costs can be challenges for connecting new renewable generation and/or large electricity loads to the electricity network?

3.0 How Renewable Energy Zones in New Zealand could enable more renewable generation

3.1 Renewable energy zones

As part of our NZGP programme, Transpower is exploring the potential to use Renewable Energy Zones to better enable generation and electrification investors to connect to the grid or local distribution networks when they may be otherwise inhibited by the first mover disadvantage or very high costs of connecting.

The concept of REZs are relatively new for New Zealand, however jurisdictions overseas have used the model for connecting generation to the network. For example, states in Australia and Texas in the U.S.A., have used, or are using, the REZ concept to enable significant volumes of generation investment by co-ordinating the connection of several generators to the local network via shared network assets.

These REZs typically involve multiple generators connecting to the transmission or distribution network via a shared connection asset that is sized for the REZ. In some instances, the shared connection assets may be closer in definition to New Zealand's interconnection assets. REZs can also include storage technology, such as grid-scale batteries, to help firm the REZ generation output. This is particularly useful when the renewable generation is intermittent (e.g. wind and solar) as opposed to more steady or controllable renewable generation (e.g. hydro or geothermal).

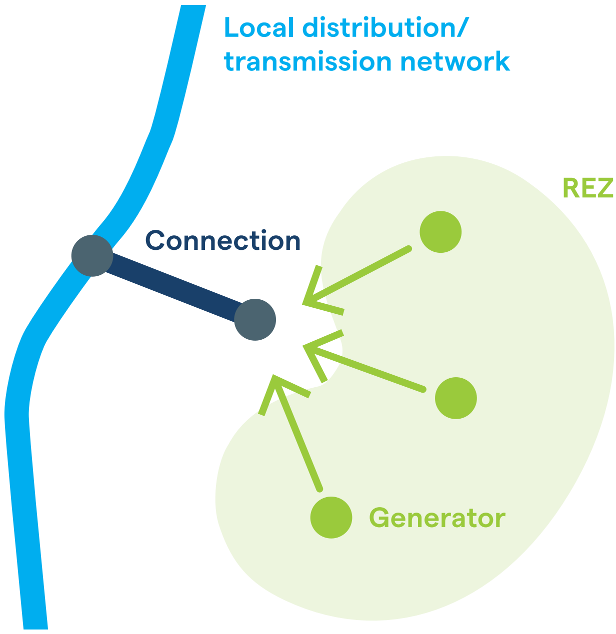

Figure 4: Simple renewable energy zone configuration

In this paper, we will predominantly focus on the role of REZs in enabling new renewable generation. However, it is possible to use the same or similar processes to enable more electrified energy use. Similar models exist such as:

- **'Industrial clusters'**, where several large geographically clustered electricity users (such as electrified process heat, manufacturing or data centres) connect to the network via a shared connection
- **'Renewable energy industrial clusters'**, where electricity users are co-located with renewable generation. This enables the electricity users to take advantage of lower cost electricity due to decreased transmission costs.

REZ development overseas has typically used a process where generation developers are committed up front so that the network investment is designed to the right size, and all costs are shared and recovered from the connecting generators.

The process helps to overcome the first mover disadvantage by co-ordinating and developing a commercial framework for connecting generators up front, before the development of the transmission/distribution assets, and therefore reducing the need for a single customer or the network owner to fund an oversized connection.

REZs also help to overcome the high connection costs to individual customers, because the costs are able to be shared between several connecting customers. Also, the incremental cost of making a connection capacity larger is generally low, such that it is possible for larger connections to be lower cost on a per unit basis (i.e. $/MW).

A REZ may also arise in circumstances where the wider benefits of regional development and/or decarbonisation, in conjunction with efficient network investment, help to build the economic case for REZ development.

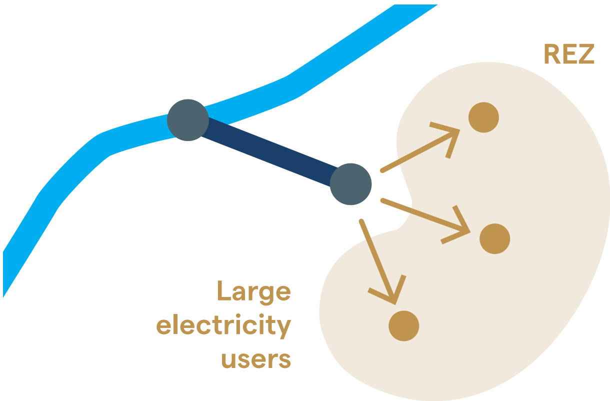

Figure 5: Industrial cluster

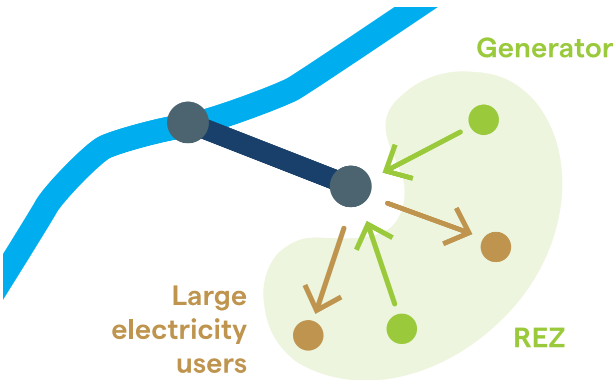

Figure 6: Renewable energy industrial clusters

Example of how REZs could be a more economically efficient way to connect for customers

Consider an example where a single generation customer with a 100MW plant wants to connect to the network. The connection to the network will cost them $47 million (as shown below). On average, the generator will pay $0.47m in connection costs to enable each MW of generation.

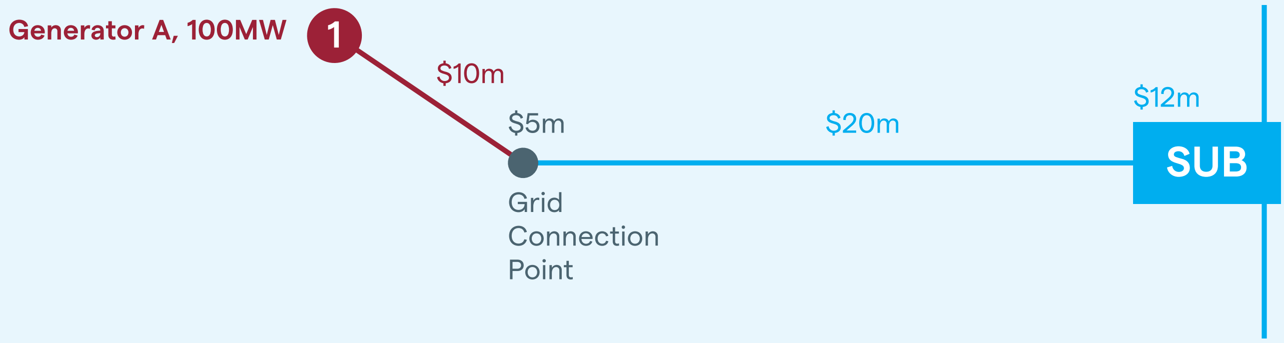

Figure 7

Now consider an example of a Renewable Energy Zone. There are three geographically clustered generators seeking to connect to the network. Rather than all individually investing in separate connections to the network, they invest in shared connection assets.

As shown below, three plants totalling 300MW in capacity connect for a cost of $97 million. On average, the three generators pay $0.32m in connection costs to enable each MW of generation. Due to the configuration, Generators B and C will pay a slightly higher per MW cost than Generator D.

Under this REZ configuration, each generator pays less to connect compared to what they might if they each invested in their own connection. Also, while the overall cost of network required to enable the REZ is almost double the cost of the investment for a single generator, the average cost per MW of generation enabled is significantly lower.

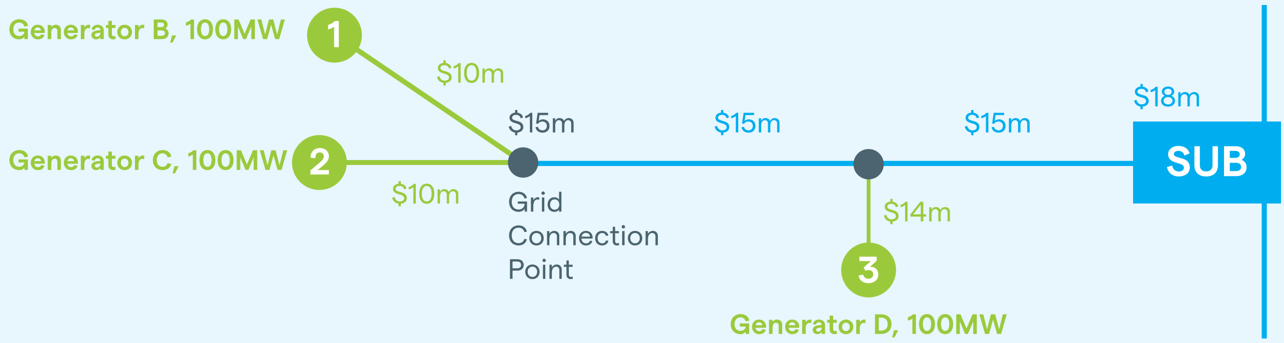

Figure 8

Scenario	Party	Total connection cost	Average connection cost/ MW generation
Individual connection	Generator A	$47 million	$0.47m/MW
Renewable energy zone	Generator B	$36 million	$0.36m/MW
	Generator C	$36 million	$0.36m/MW
	Generator D	$25 million	$0.25m/MW
	REZ total	**$97 million**	**$0.32m/MW**

Figure 9

Renewable energy zones are likely to require new or upgraded grid connection assets. Depending on the nature of existing infrastructure and nature of the volume and types of new generation, a REZ could also require investment in the local distribution network and the interconnected grid. In Figure 10 below, we illustrate several potential configurations that could arise.

Therefore, any development of a REZ would likely require strong collaboration between Transpower and the local distribution business to ensure an optimised outcome across the required networks to delivers the greatest benefits to consumers.

Examples of transmission only renewable energy zone configurations

Examples of integrated transmission and distribution renewable energy zone configurations

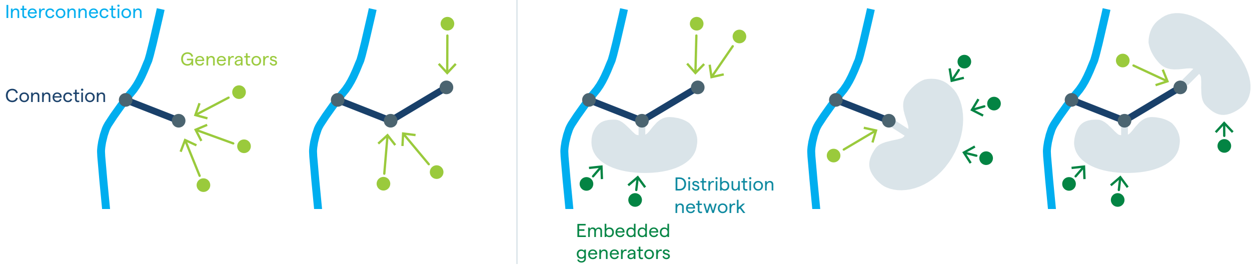

Figure 10: Examples of potential transmission and distribution renewable energy zone configurations

Examples from overseas

Outside of New Zealand, jurisdictions have explored the role of renewable energy zones to enable new generation in the electricity system. Since the early 2000s, Texas has used renewable energy zones to enable over 18GW in new renewable generation investment. In Australia, the development of REZs are still in varying early stages across the states of Victoria, New South Wales and Queensland.

Texas

In 2005, the Texas legislature passed Texas Senate Bill 20, which ordered that the Public Utility Commission of Texas (PUC)—in consultation with the Electric Reliability Council of Texas (ERCOT)—to designate competitive renewable energy zones (CREZ) and develop a transmission plan to deliver renewable power from CREZ to customers, while maintaining reliable and affordable electricity. From 2005 to 2014, Texas undertook a CREZ development process.

The aim of the CREZs were to enable the development of new renewable generation in areas of Texas that had significant wind resource and transport this electricity via expanded or upgraded transmission infrastructure to more populated areas within the state. Prior to the implementation of CREZs, wind development overwhelmed existing transmission due to a lack of high voltage lines in the windiest parts of West Texas, leading to network congestion, curtailment of wind generation, and stymied investment.

The resulting CREZ plan targeted high-capacity transmission development for zones containing three to four times more undeveloped wind potential than the new high-voltage lines could accommodate. This enhanced competition among renewable electricity developers and ultimately incentivised them to develop high-quality projects at least cost. The costs of developing transmission for CREZs were folded into the electricity rate base that funded the rest of the transmission system.

The implementation of CREZs has helped to enable the addition of more than 18 gigawatts of wind energy generation capacity to Texas's power system while overcoming technical issues such as curtailment and transmission congestion. Furthermore, Texas is on track to build 70% more wind capacity than initially planned based on projects that have had Interconnection Agreements signed in 2020. The CREZ lines are also now enabling a utility-scale solar boom in Texas that was never part of the original plan.

Few predicted the magnitude of the economic benefits of the Texas CREZ Project: annual electricity production cost savings of $1.7 billion per year plus another $5 billion in incremental economic development. With a service life of 30 to 50 years, the benefits of the CREZ lines will return their construction cost of $7 billion many times over.[6]

6. https://cleanenergygrid.org/texas-national-model-bringing-clean-energy-grid/
   https://greeningthegrid.org/Renewable-Energy-Zones-Toolkit/quick-reads/renewable-energy-zones-delivering-clean-power-to-meet-demand/view

New South Wales

In New South Wales, the state government has set out a plan to deliver the state's first five renewable energy zones. REZ development in NSW is being led by the Energy Corporation of NSW (EnergyCo NSW) which is a NSW-Government-controlled statutory authority that will be responsible for coordinating REZ transmission, generation, firming and storage projects to deliver efficient, timely and coordinated investment. EnergyCo will also be responsible for consulting and engaging with communities to ensure the benefits of investment are equitably shared within host regions.

NSW's first REZ, the central-West Orana Renewable Energy Zone, was formally declared in November 2021, which is the first step in formalising the REZ under the Electricity Infrastructure Investment Act 2020. The REZ is expected to unlock up to 3 gigawatts of new network capacity by the mid-2020s, enough to power 1.4 million homes. It is expected to bring up to AU$5.2 billion in private investment to the region by 2030 and at its peak, support around 3900 construction jobs. The NSW Government has committed over $40 million towards the development of the Central-West Orana REZ.

In June 2020, the NSW Government received 113 registrations of interest for the Central-West Orana REZ, representing 27 gigawatts of new energy generation and storage projects. This is 9 times the amount required to deliver the REZ.

The Government has recently concluded a round of consultation on the Central-West Orana REZ Access Scheme, which will be the first of its kind in the National Electricity Market. The Access Scheme will help to govern the volume of projects allowed to connect to the REZ, define their rights to access the network and enable active coordination of network, generation and storage investment. This will help optimise the network, reducing bills for energy consumers and improves planning outcomes for local communities.

They have also started on-the-ground consultation with local communities and regional stakeholders in the Central-West Orana REZ to help inform coordinated strategic planning and ensure that the REZ complements existing agricultural and primary-land uses, reflects local priorities, and retains existing economic activity and social values within the Central-West Orana region.

Transgrid, the State's privately owned transmission network planner and operator, is in the early stages of planning the backbone transmission needed to enable generators participating in the REZ to export electricity to the rest of the network.

Victoria

In Victoria, the state government, after consulting with public on its REZ Development Plan directions paper, announced six major network projects to receive immediate funding, which have been selected from the Stage 1 projects set out in the REZ Development Plan. Three of these projects are to support system strength, and the remaining three are called *transmission network augmentation projects*, which will boost the grid's ability to accommodate additional generation. Procurement for these projects is currently underway.

A new body, VicGrid, has also been established to coordinate planning and development activities for the Victorian REZs and to oversee investment decisions in connection with the $540 million REZ fund. VicGrid sits within the state Department of Environment, Land, Water and Planning.

The Victorian Government continues to consult with stakeholders on the proposed role and structure of VicGrid, and the feedback received on the REZ Development Plan Directions Paper illustrates that there are still a number of issues to be worked through, including in relation to funding and cost recovery, and clearly defining VicGrid's roles and responsibilities (as distinct from those of AEMO, the market operator) and how these two entities will interact.

3.2 Where could REZs emerge in New Zealand?

In overseas examples, REZs have emerged in geographical areas where there is a high level of renewable energy resource, such as wind and/or solar, land that can be developed into renewable generation projects and appetite from developers to build new generation projects.

They are also likely to emerge in areas where electricity networks currently do not have sufficient capacity for new generation but there is high demand for network capacity from potential generation developers. These areas are generally relatively remote from the grid backbone.

Transpower expects REZs could be suited to regions in New Zealand that are located on the 'edge' of the national grid such as Northland, Taranaki, Wairarapa, Hawkes Bay, the East Coast of the North Island, the West Coast of the South Island, and Southland. Some of these areas are not well served by the transmission and/or local distribution networks due to sparse and distributed populations and limited electricity demand but have significant renewable resource potential.

Many of these regions are also served by connection assets rather than interconnection assets. As a result, upgrades to existing transmission, or development of new transmission, needs to be funded by the connecting party. This can result in the first mover disadvantage arising – where it is economic for some of the prospective generators in the area to share the cost of the upgraded transmission infrastructure, but where it is too expensive for an individual prospective generator to fund the entire transmission investment themselves.

During consultation as part of our Net Zero Grid Pathways programme of work, responders and our customers told us that there is around 11GW of wind and solar generation that investors may consider building in the next 30 years.

Around 6GW of this generation can be built under current market arrangements and processes. The remaining 5GW of this generation is in regions where currently, high connection costs or the first mover disadvantage could inhibit investment under current processes and regulatory frameworks. REZs could enable access to this generation. This renewable potential is materialising into real interest from generation developers. Transpower and distribution businesses in many of these locations have already received a large volume of enquiries and/or applications from generation developers.

Renewable industrial clusters could also emerge in Southland, Bay of Plenty and Taranaki based on recent announcements from various parties seeking to electrify their process heat or invest in other electricity intensive processes (e.g. hydrogen production or data centres).

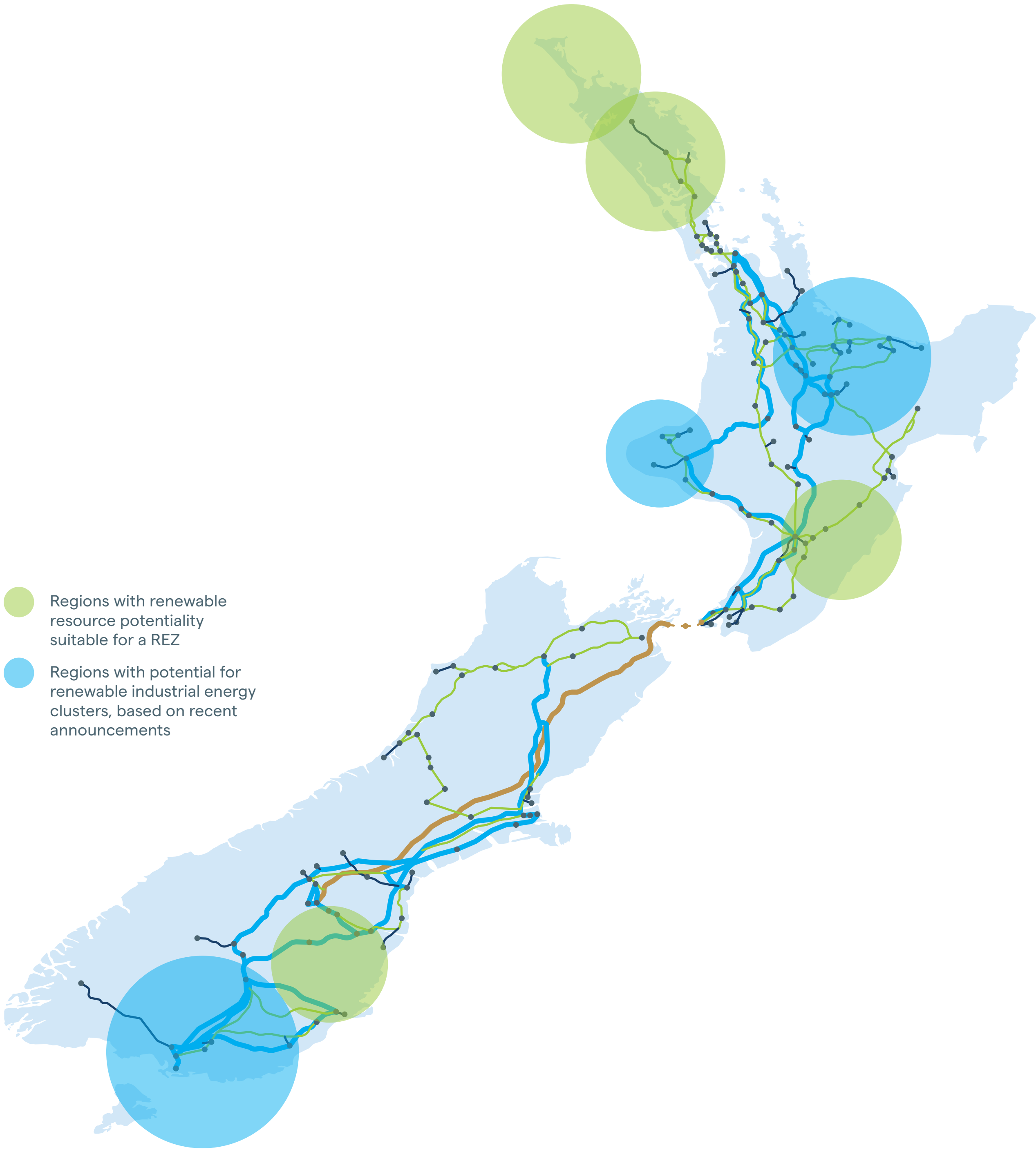

Figure 11: Potential renewable generation and industrial clusters based on NZGP consultation and media releases

3.3 Benefits of Renewable Energy Zones

Considered development of Renewable Energy Zones in New Zealand could unlock benefits at several levels: nationwide, regional and consumer. The extent to which these benefits can be realised depends on how we progress with REZ development. A cost benefit analysis on potential REZs in New Zealand that considers both an electricity perspective, and a broader socio-economic perspective could be a useful tool for informing REZ decision making.

During our preliminary investigation, Transpower has identified several key benefits that REZs can bring to the energy system:

- supporting the achievement of a net-zero carbon economy by unlocking more renewable generation through efficient generation, storage, transmission and distribution development.
- increasing electricity system resilience and reliability through diversified electricity sources and generation locations.
- increasing competition in the wholesale market with the potential to lower regional electricity prices for consumers.

Furthermore, REZs also have the potential to not only benefit the energy system but to also deliver improved social and economic outcomes. Benefits that expand beyond the energy system include enabling regional economic development and job creation, and broader economic development by providing co-location opportunities for large energy users. Consideration of these benefits could be included in the REZ development process and form part of the economic case.

Questions

Q2.

Do you think the concept of a Renewable Energy Zone could be beneficial in a New Zealand context?

Q3.

What region(s) do you think would be suited to Renewable Energy Zones?

Q4.

What benefits do you think should be considered in the decision-making process for Renewable Energy Zones in New Zealand?

4.0 Potential process for developing Renewable Energy Zones in New Zealand

In this section we outline a potential method for developing REZs in New Zealand. It is based, in part, on how REZs are being delivered overseas. This is a preliminary view only and is a starting point from which interested parties can collaborate to refine or change, to deliver the best outcomes for New Zealand.

4.1 Guiding principles for developing Renewable Energy Zones

When thinking about we might go about developing a Renewable Energy Zone, and particularly, in thinking how we navigate the potential challenges that may arise, there are five overarching principles that we seek to use:

01

REZs are built to harness and unlock renewable energy resource, storage and efficient network infrastructure to support the long-term decarbonisation and energy needs of Aotearoa, as well as the region hosting the REZ.

02

REZs are customer driven and are only built where there is clear demand from generation or load developers. This will help to ensure that a REZ is developed in line with the market, decreases the risk of investing significantly in infrastructure that may be underutilised or local consumers having to cover the incremental cost of network investment.

03

Local consumers will be no worse off as a result of developing a REZ. Our intent is to define a funding model that ensures new generation connections or demand developers cover the cost of the network investments required so that the additional costs associated with a pilot REZ in the Northland region do not fall on local consumers. The funding model needs to align with transmission and distribution pricing regulation.

04

REZs are developed through partnerships and collaboration with local iwi and stakeholders to ensure that regions hosting a REZ receive a net benefit from the development.

05

REZs deliver net benefits to Aotearoa's electricity system where existing connection processes cannot. For example, by increasing competition in the wholesale market to potentially lower regional electricity prices, increasing diversity or supporting reliability or security of supply.

06

REZ location and REZ participant selection are done via a transparent methodology to ensure potential regions and REZ participants are given the opportunity to build their case, including demonstration of any wider social, economic or environmental costs and benefits to the region.

07

REZs are enabled with minimal changes to the existing electricity regulatory framework. Large changes to the regulatory framework can take a significant amount of time to undertake and can have wide reaching implications to existing connected customers.

4.2 Collaborating, partnering and engaging to deliver good outcomes

If we proceed with investigating the application of Renewable Energy Zones in New Zealand, it will be a challenge that requires collaboration and partnerships across the electricity sector, and broad engagement with iwi, hapu, local communities and other stakeholders.

Successful REZ development will require key stakeholders to be involved from the beginning of the process to help determine the best way forward for New Zealand and local communities.

As the grid owner and operator, Transpower will have an enabling role to play alongside government, the Electricity Authority, the Commerce Commission, and partners such as industry bodies, generators, iwi and regional authorities, and other interested businesses and investors.

Transpower is committed to ensuring we engage and consult meaningfully with iwi and hapu that may be impacted by or may be interested in partnering on a REZ development in their region.

Stakeholder engagement is critical both now, at the start of this REZ exploration process, and throughout the process of developing individual REZs in the regions if the decision is made to go ahead. Prior to any REZ development in a specific region, parties involved would need to engage iwi, hapu, communities and other local stakeholders to ensure a REZ is developed in a way that balances the benefits and costs to a region from an energy, environmental, social, cultural and economic perspective.

4.3 Selecting regions for REZ development

There are several regions around New Zealand where new renewable generation could be enabled by a REZ and could otherwise be inhibited by the first mover disadvantage or high connection costs. There are also several regions that could benefit from a REZ due to other local economic factors – for example, in regions where large industries are shifting and leaving behind infrastructure and workforce that could be pivoted to newly forming industry.

To ensure we prioritise our efforts in developing REZs, it is important that these potential regions are considered against a set of transparent criteria. Transpower has identified several criteria that could make a region a good candidate for a REZ development. We believe that the most important criterion is that it must be customer driven. This can be determined by assessing generation developer demand in the location.

Proposed criteria that should be considered:

- **Generation developer demand:** Are there already significant numbers of renewable generation developers seeking to build in the area?
- **Economically efficient network investment:** Is the estimated cost of network investment per unit of generation capacity ($/MW) lower in a REZ compared to connecting generation to the grid via current connection processes?
- **Network capacity in the region:** Are areas on the local network nearing capacity?

Other proposed criteria that could be considered:

- **Access to good renewable resource:** Does the region have high levels of wind, solar and/or other renewable resources in areas where lower cost land is available?
- **Potential added benefits to the grid:** Would additional generation and storage improve network resilience, diversity or enable interconnection investment deferrals?
- **Additional economic and social benefits:** Is there a socioeconomic case for investment in the region? For example, by enabling a just transition following departure of large industry.

4.4 Proposed tender process to attract and commit generation

Transpower has explored how jurisdictions overseas have gone about implementing REZs in their regions to understand how REZs could be implemented in New Zealand once a suitable region has been identified.

We have looked particularly at Australia, where their model could be adapted for the New Zealand electricity context. Broadly, REZ developers in Australia have designed network infrastructure that will enable a level of renewable generation capacity. Prior to proceeding with the development of the network infrastructure, the REZ developers use a tender process to contract in generators who then split the cost of the infrastructure investment.

In New Zealand, we think a similar approach could work within our existing regulatory frameworks to co-ordinate the development of new renewable generation and fund the transmission connection and/or distribution network investments that would be required to service a REZ.

Transpower has drafted how the process might be followed in the New Zealand context in Figure 12. We have not attempted to assign ownership of activities within the process to parties and do not wish to imply that Transpower or the electricity distribution businesses would solely be undertaking all the steps. Through this consultation, we are seeking your feedback on the opportunity for others to take ownership of or partner with Transpower to deliver the process.

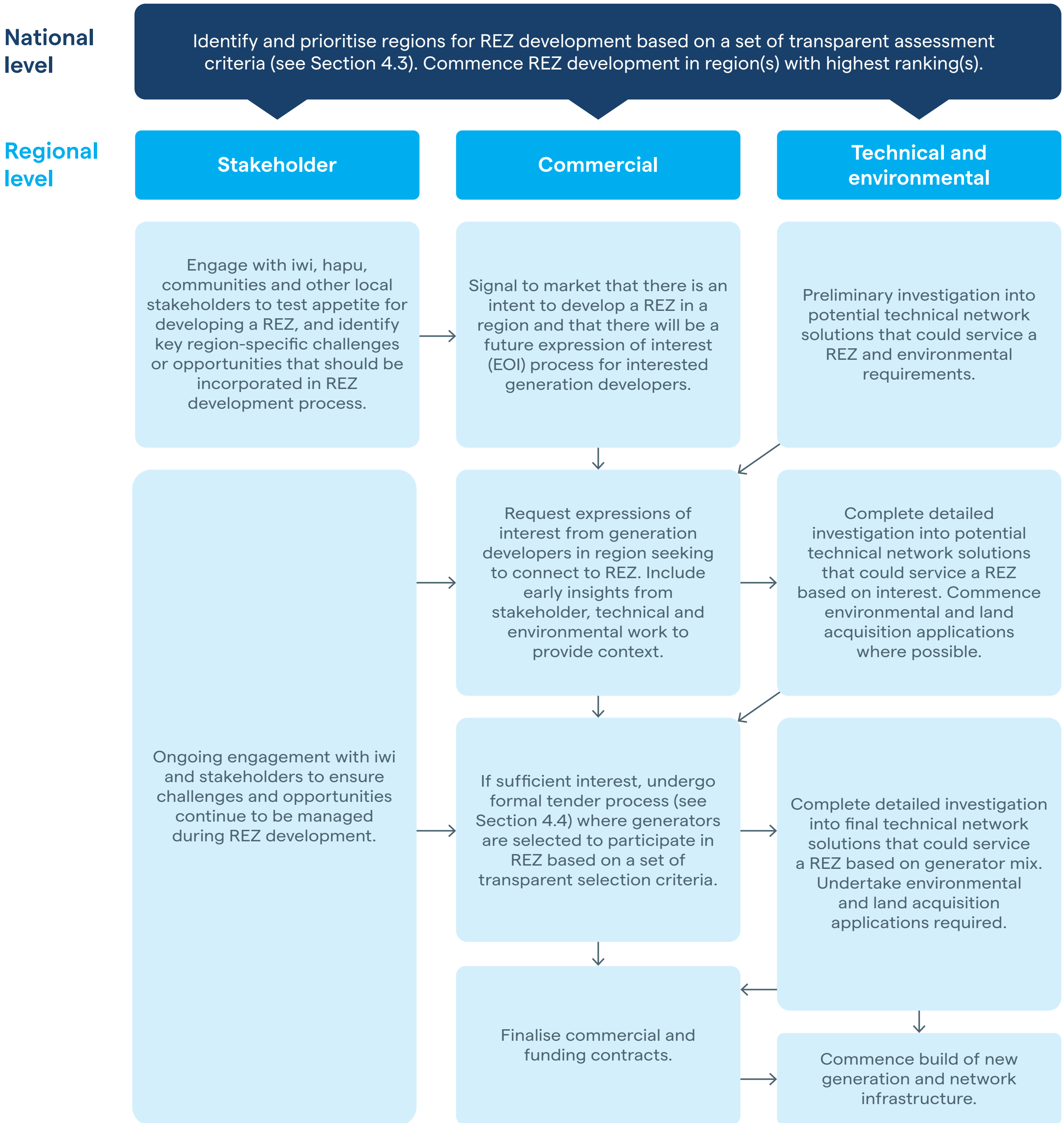

Figure 12: Potential process for developing REZs in New Zealand

Once it has been agreed that a REZ would be progressed in a particular region, the process generally follows an initial period of market signalling, where the REZ co-ordinator informs the market that they intend to develop a REZ in that region and that they will undertake an Expression of Interest process within a period of time (e.g. one year). This warming period provides prospective generation developers time to investigate the potential for them to invest in building new generation in that area. During this period, the transmission and/or distribution network owners can also begin scoping potential network investments to service new generation.

The REZ co-ordinator then goes through a formal Expression of Interest process, whereby prospective generation developers formally submit their interest in developing generation in the region. Through this process, the REZ co-ordinator is able to gauge the level of renewable generation interest in the region. If there is little or no interest, then the REZ co-ordinator can stop progressing the REZ further. This is an important step, as it ensures any REZ development is in line with demand from the market. If there is significant interest, enough to justify a REZ, then the REZ co-ordinator can proceed with a tender process.

The tender process is a means of selecting the generation projects that will be enabled by a REZ and co-ordinating the funding of any transmission connection and/or distribution network investments that will be required to enable the REZ. It is important that the project selection process is transparent and does not inadvertently crowd out competition in the market or prevent access.

In the tender process, prospective generation developers will be ranked against several criteria that help to determine how likely the project is to go ahead. Transpower has identified several criteria that projects could be scored against during the tender process (see right).

Proposed project selection criteria

Criteria could include:

- Land secured
  (not started, in negotiation, secured)
- Stage in financing
  (none, in process, secured)
- Stage in design
  (concept, developed, detailed)
- Stakeholder engagement
  (not started, plan in place, in progress)
- Consenting
  (not started, in progress, secured)
- Network connection concept assessment
  (not started, in progress, complete)

The criteria can be further developed and weighted to enable projects to be, for example, scored out of 100 based on how well they fulfil the criteria. This weighted score can then enable the REZ co-ordinators to select the projects that would be included in the REZ based on the level of generation capacity that can be enabled by REZ network investments, as shown in Figure 13.

There may be multiple levels of network and generation capacity that can be technically feasible for a REZ from an asset investment perspective (e.g. a 100MW, 300MW or 800MW REZ). One method that might help to determine the appropriate size of the REZ is a cost benefit analysis, not only at an electricity system level, but also considering the wider regional economic, social, and environmental factors. For example, an 800MW REZ may be the most economically efficient solution from a technical and electricity market perspective but may require significant new network and generation assets that could be more costly from an environmental or social license perspective.

It is also unlikely that the chosen REZ size would be at the maximum level where all interested generation developers would be included. This is because it may be important that there are generation projects sitting on a waiting list that can be pulled in should one of the initial projects fall through. We discuss this further in Section 5.2.

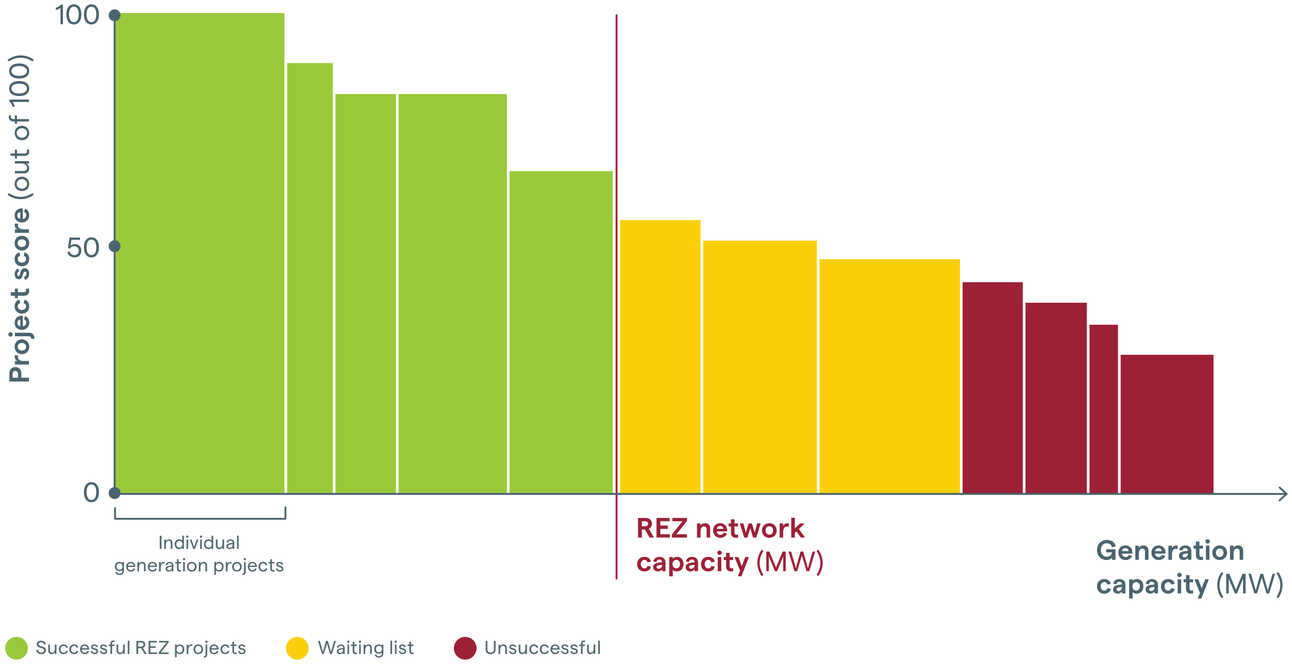

Figure 13: Illustration of how generation projects might be selected for participation in REZ

The prospective generation developers that have been selected to participate in the REZ will then be required to contractually commit to partaking in the REZ. Under this agreement, each developer will be required to fund a portion of the transmission connection and/or distribution network upgrade required to service the REZ. This funding would be pro-rated against each generator's generation capacity.

This process ensures that there is sufficient generation development to utilise and pay for the large network investments and minimises the risk of the asset owner holding underutilised infrastructure or for the network owner to socialise the costs of unused capacity across its other customers.

Also, because the network investment has been sized to match the new renewable generation, each generator should be able to dispatch on day one. A challenge that may arise is that due to New Zealand's open-access grid, each generator in the REZ cannot be guaranteed ongoing firm network access. We discuss this challenge and potential mitigation measures in Section 5.1.

Once generation projects have been commercially contracted into the REZ, the detailed design of the transmission connections, interconnections and/or distribution network upgrades can be completed, before commencing the build phase. Any interconnection projects required to service the REZ will be defined by the levels of generation committed in the REZ and the interactions with the rest of the transmission system. The costs of any interconnection investment will be recovered via the Transmission Pricing Methodology.

It is expected that environmental consenting processes would also commence at the appropriate stages of the REZ development process. We discuss some of the challenges in regard to this in Section 5.3.

As discussed earlier in Section 4.2, ongoing stakeholder engagement will be critical to informing and shaping the development of a REZ in a region. Prior to any REZ development, parties involved would need to engage iwi, hapu, communities and other local stakeholders to ensure a REZ is developed in a way that balances the benefits and costs to a region from an energy, environmental, social, cultural and economic perspective. High levels of engagement with stakeholders will need to be maintained through to the completion of the REZ development and beyond.

Questions

Q5.

Do you agree with the proposed guiding principles? Are there any that you would change or add?

Q6.

Do you agree with the proposed criteria for selecting suitable regions for REZ development? Are there any that you would change or add?

Q7.

Do you agree with using a tender process for committing projects in a REZ? Are there alternative processes that could be considered?

Q8.

Who should be involved with co-ordinating and undertaking the various steps within a REZ development process?

Q9.

Do you agree with the proposed project criteria? Are there any that you would change or add?

5.0 Challenges and opportunities in developing Renewable Energy Zones in New Zealand

Because Renewable Energy Zones have not been developed in New Zealand before and are a different way of co-ordinating distribution, transmission, storage and generation (or electrification) investment, there are several regulatory and commercial challenges that will need to be navigated.

In this section, we detail our preliminary understanding of what challenges might arise during the process of establishing REZs in New Zealand and how parties might address them. We are seeking feedback on whether we have correctly identified these challenges and on potential solutions. The principles set out in Section 4.1 should again be used to help inform how we navigate these challenges.

5.1 Access and firm capacity rights

At the transmission level, New Zealand operates an open access regime. This means that any party seeking to connect to the grid is able to do so if it is technically possible and if they are able to cover the costs of connecting. The open access regime exists to prevent Transpower from being required to over invest in the grid, or compensate connectees (generators or electricity load customers), to maintain firm access rights that may not deliver net benefits to electricity consumers.[7]

A REZ may typically require a larger upfront transmission investment (e.g. upgrading a transmission line) than a single standalone connection. Under an open access regime, generators include the risk that they may be constrained off in their investment decisions. If further generation investments occur later, and result in constrained capacity, generators are dispatched based on their wholesale market bids. Under the Investment Test, Transpower assesses whether it is in the long-term interests of consumers to prevent the constraint or alleviate one that is created.

As ‘first movers’ are not provided financially firm access rights and capacity they must incorporate the risk of being constrained off into their investment decision. When dealing with multiple connectees, it may be more difficult to achieve the coordination, because third parties connecting later (second movers or free-riders) may undermine the committed connectees’ investment case. The second movers make their decision to connect considering the existing generators taking up the available capacity. If the second movers are confident in their ability to consistently bid their electricity generated at a lower cost than existing connectees and can therefore be dispatched, then they may see connecting into the REZ as a good option.

7. For the avoidance of doubt, when we refer to ‘firm access rights’ we are referring to financially firm access rights.

This is the same issue all potential new generating projects face when they connect directly to the grid but is exaggerated for REZs if the 'first movers' are expected to fully or partially fund the wider transmission assets in the REZ and/or are connecting to the distribution networks. We note the proposed new TPM has mechanisms that intend to remove pricing that would otherwise disincentivise a party from being a 'first mover' on the transmission network.

While designing a tender and contracting process that ensures the network capacity is appropriately allocated for each REZ connectee such that they are able to access capacity on day one (as described in Section 4.4) can, to an extent, disincentivise second movers, the risk still remains for first movers and poses a challenge for REZ development.

The New Zealand electricity market already incorporates financial transmission rights (FTRs), which provide a hedge for those generators who consider they may be 'constrained off'. However, these are not guaranteed rights, as generators must buy FTRs at auction.[8]

There are several other solutions that may help to mitigate the challenge described above:

- **Changing the access regime** to allow for assignable firm capacity rights would be a significant process, on par with, or more challenging than, changing the TPM. While a firm capacity rights regime may provide more certainty for generators in a REZ, it would have a profound impact on many parts, and the operation, of the electricity market.
- **Privately owned connections** could enable a third party to build and own the REZ connection assets. Because this connection would sit outside of Transpower's grid, it may not be subject to the same open access regime, unless otherwise determined by the Electricity Authority. Therefore, the third party may have control over who in the REZ could connect and what capacity they might be allocated. This potential solution would likely only emerge for greenfield connections.
- **Private storage investment,** such as grid-scale batteries, could be integrated into the REZ over time to prevent generation from being curtailed or constrained during periods where generation output exceeds the network capacity.

8. In Australia, renewable generators disagreed with the proposal to introduce FTRs, and that resulted in the adoption of the Congestion Management Model (CMM) instead. The CMM provides financially firm capacity rights to existing generation and those that build in designated locations, such as REZs.

5.2 Funding and cost recovery

A funding and cost recovery model that ensures current New Zealand customers are net beneficiaries of a REZ is an important aspect that will need to be clarified prior to any investments in network infrastructure being made. Part of the challenge of defining a funding and cost recovery model is in understanding the different cost recovery frameworks that exist for the transmission and distribution networks.

In Figure 14, we detail our high-level understanding of the cost recovery mechanisms for new generation or large electricity users connecting to the distribution or transmission networks. It is important to note that the Transmission Pricing Methodology (TPM) is currently undergoing reform. At time of writing, the Electricity Authority is still considering the final form of the TPM which is likely to have implications on some of the costs outlined below.

Generator or large electricity user connects direct to transmission

Distribution	Transmission connection	Transmission interconnection
No cost	Customer pays incremental cost of dedicated assets (usually financed over time) and a share of ongoing costs relating existing assets. Because the Customer pays, it is likely that investment is right sized without additional capacity for future connectees. Under the proposed TPM (which the Authority is in the process of determining) if Transpower can justify a larger connection asset, then the cost and risk of investment in the additional capacity is pooled and shared more widely – potentially across all parties connected to the Grid or regional parties only. The allocation methodology will be prescribed by the Authority.	The customer pays charges as defined by the TPM. An allowance for interconnection investments is approved by the Commerce Commission. The allowance is either provided through our five-yearly Individual Price-Quality Path determination, for projects <$20m, or the Major Capital Project process for projects >$20m.

Figure 14: Existing connection process and cost recovery mechanisms by network *(continues on following page)*

Generator connects within distribution network

Distribution	Transmission connection	Transmission interconnection
If network capacity exists, then the generator is able to connect. It will pay the incremental connection cost. If network capacity does not exist and/or code compliance issues arise, then the generator pays any incremental cost of a network upgrade if applicable. Because the generator pays, it is likely that upgrade is right sized without additional capacity for future connectees. If there is a new generation connectee(s) to the first generator's funded assets within three years, then the second comers will pay the first comer for their share of the use of these assets.	Where the distribution network connects to the grid, the distribution business pays for any connection upgrades required. If a new embedded generator triggers the need for an upgraded transmission connection, then the distribution business can charge the incremental cost to the generator.	The distribution business pays charges as defined by the TPM which includes any charges that arise due to generators connected to their network. If the charges increase due to the connection of a new embedded generator, then the distribution business can pass through the incremental cost to the generator.

Large electricity user connects within distribution network

Distribution	Transmission connection	Transmission interconnection
The user is able to connect to the network and pays a charge that is determined by the distribution business that should cover its connection costs and an appropriate proportion of the distribution business' common costs. The distribution business can charge the connectee for network upgrades. Any load users that connect using those assets afterwards may be required to pay back some of the cost to the first connectee, depending on the distribution business's policy. The distribution business can determine if they will require upfront payment for network upgrades or will finance them over time in the lines charges.	Where the distribution network connects to the grid, the distribution business pays for any connection upgrades required. Distribution businesses will typically invest to allow for future anticipatory electricity demand. New large electricity users may be required to provide a capital contribution. Distribution businesses determine how they will recoup connection charges from load customers.	The distribution business pays charges as defined by the TPM which includes any charges that arise due to large electricity users connected to their network. How the costs are split are at the discretion of each distribution business. Large load customers will typically pay a larger proportion of the costs, sometimes based on a transparent pass-through based on their regional coincident peak demand (although this option will cease to be available under the proposed TPM).

Figure 14: Existing connection process and cost recovery mechanisms by network *(continued from previous page)*

The first potential funding challenge we have identified arises from the timing of when Transpower or a distribution business invests in additional network capacity to enable a REZ compared to the timing of when customers commit to connecting to the REZ. This timing has an impact on who covers the cost of the network investment and how.

It is important to note that the funding discussion below relates predominantly to transmission connection and distribution network investments. Transmission interconnection investments will be informed by the additional connection capacity expected and justified via the Investment Test. As discussed further in Section 2.4, the costs of interconnection investments are recovered via the TPM.

Right sizing for committed generation (or load)

As indicated by our Guiding Principles (Section 4.1), we believe it is important that the costs of the network investment for a REZ are recovered in a way that ensures current New Zealand customers are net beneficiaries of a REZ. The tender process (proposed in Section 4.4) is one potential way of achieving this. By committing generation up front prior to network investment, then the investment is sized for the committed generation and enables all costs to be recovered from the generation.

In an ideal scenario, the tender is robust, and the generation and network development are timed such that all connectees are able to cover their portion of the connection at commissioning date. However, this is an unlikely scenario and risks may arise that will need to be mitigated.

For example, even with a robust tender process, there is still a risk that costs are not fully recovered due to connectees pulling out of the contract after network investment has been triggered. One of the options for mitigating this risk could be to oversubscribe the network capacity or have a waiting list where generation developers who were not initially successful in the tender can take the place of any developers that pull out. To help to anticipate whether this event might be triggered, developers who are locked into the REZ may be contractually required to continue fulfilling the project selection criteria by prescribed timings – a 'use it or lose it' concept for initial network capacity.

Another risk may arise with connecting parties delaying their ability to connect (e.g. consenting or development timelines extended) which means they may not be in a position to pay for network investment upon network commissioning. Mitigating measures could be designed into the contract during the tender process. Alternatively, a third party, such as the Government, could underwrite the unused capacity until generators are able to connect. The third party could then recover the costs once connectees come online.

Oversizing for future growth

There is also the option to invest in transmission connection or distribution network capacity ahead of need. This can be either in the form of oversizing a connection that has been triggered by a connectee seeking to connect, or a 'build and they will come' approach.

Currently, Transpower is able to invest in a larger connection than what is required by a connectee if it can be justified via the Investment Test. Currently, Transpower is unable to recover costs from this additional spare capacity. The Electricity Authority is currently consulting on an allocation method in the TPM that could provide a mechanism to do this, both for type 1 and type 2 FMD issues. Building connection capacity ahead of need and with no contracted connectee is generally not practiced.

Distribution businesses can, at their discretion, invest in further network capacity than is required. If the investment is not triggered by a connectee, then the costs are socialised across the distribution business' customers, most of which are households.

If a generation customer seeks to connect to either the transmission or distribution network where the network owner has invested in additional capacity prior to the customer enquiry, then the generator is able to connect and is required to pay only the capital cost of the component that connects the plant to the existing network connection. In this scenario, the additional network capacity that has enabled this new generation has been paid for by several connected parties.

The challenge of using this model is that it requires either existing transmission or distribution customers to cover the costs of some or all of the network investment. This is likely to be an unattractive option, particularly at the distribution network level, as it will be New Zealand households paying for the benefit of generators or large energy users (although noting that households might receive some benefit from lowered electricity prices).

To mitigate the risk of additional costs falling onto existing connected customers, a third party, such as the Government, could provide some level of underwriting for the network investment. As discussed earlier, this third party would cover the cost of the additional unused network capacity and could recover the cost as new generators or energy users connect to the network. This party would hold the risk of the capacity not becoming fully subscribed.

There is also an additional matter that will need to be worked through if a REZ is to progress. Due to the different regulatory and cost recovery frameworks that govern the transmission and distribution networks, there may be differences in what connectees are charged in total depending on where they connect. Closer examination of the transmission and distribution charges is required to determine how significant any difference is and whether any actions are required to create more alignment.

5.3 Environmental approvals

Renewable Energy Zones will require environmental approvals by several developers and asset owners to enable the infrastructure required. For example, all generators who connect to the REZ will require approvals, any distribution upgrades and investments might need approvals if not already covered by existing permissions, and the same with transmission investments.

Individually, the process for gaining environmental approval for a project can be complex and time consuming. However, additional challenges could arise in a REZ development due to the need to undergo the process for multiple projects in the same area such that the timeline for developing the various generation and network investments are also broadly aligned.

The current reform of the Resource Management system also creates uncertainty in how the processes and requirements will change in the future. In their *Draft New Zealand Infrastructure Strategy*, the New Zealand Infrastructure Commission Te Waihanga recommends that consenting of low emissions energy infrastructure is streamlined while also meeting environmental objectives.

Transpower expects the Regional Spatial Strategies (RSSs) developed under the proposed Strategic Planning Act could identify areas that are appropriate for REZ development. However, in the absence of RSSs, existing Resource Management Act (RMA) processes would apply, and environmental assessments used to determine the appropriateness of an area for a REZ would be undertaken.

Robust environmental processes would need to be established early in the REZ process to increase the likelihood that environmental approvals could be obtained for both the shared connection assets and the connected generation and/or load envisaged by the REZ. Consideration would need to be given to the degree of environmental assessment and public engagement, including with iwi, prior to identification of an area for a potential REZ.

Any impacts from consenting for a single connecting party could have implications across the whole REZ. Consideration would need to be given to the extent that subsequent RMA processes (investigations, engagement, applications and hearings) were coordinated. This coordination commonly occurs for Transpower customer projects at present but would be more challenging with multiple connectees.

Questions

Q10.

Do you agree with the challenges we have identified?

Q11.

What are some of the ways to overcome these challenges and who should be involved?

Q12.

Do you see any other potential challenges that need to be considered?

6.0 Have your say

Transpower is seeking feedback on the concept of Renewable Energy Zones and welcomes responses to this consultation from a wide range of stakeholders.

This consultation is open until **5:00pm, 8 April 2022.**

Submissions should be emailed to **REZ@transpower.co.nz** using the heading “New Zealand REZ Consultation” or submitted via the online form at **www.transpower.co.nz/REZ**.

Submitters may comment on any relevant aspect of our topic. We have asked some specific questions and would welcome submissions on those questions, but all relevant comments are welcome.

Submissions will be posted on our website including a summary of submissions. If any aspect of your submission is confidential, please advise us, together with the reasons why you consider it should be considered confidential, and we will not publish that part of your submission.

There are a number of parties with interests in the Renewable Energy Zone concept, including Northpower and Top Energy in the context of a Northland pilot, the New Zealand Infrastructure Commission who have proposed the concept as part of their Infrastructure Strategy, the Ministry of Business, Innovation and Employment in their energy policy role, and our sector regulators, the Commerce Commission and Electricity Authority. We are likely to discuss elements of submissions with these parties except where a submitter has asked for confidentiality.

Questions

Q1.

Do you agree that the first mover disadvantage and high connection costs can be challenges for connecting new renewable generation and/or large electricity loads to the electricity network?

Q2.

Do you think the concept of a Renewable Energy Zone could be beneficial in a New Zealand context?

Q3.

What region(s) do you think would be suited to Renewable Energy Zones?

Q4.

What benefits do you think should be considered in the decision-making process for Renewable Energy Zones in New Zealand?

Q5.

Do you agree with the proposed guiding principles? Are there any that you would change or add?

Q6.

Do you agree with the proposed criteria for selecting suitable regions for REZ development? Are there any that you would change or add?

Q7.

Do you agree with using a tender process for committing projects in a REZ? Are there alternative processes that could be considered?

Q8.

Who should be involved with co-ordinating and undertaking the various steps within a REZ development process?

Q9.

Do you agree with the proposed project criteria? Are there any that you would change or add?

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What are some of the ways to overcome these challenges and who should be involved?

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Do you see any other potential challenges that need to be considered?

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