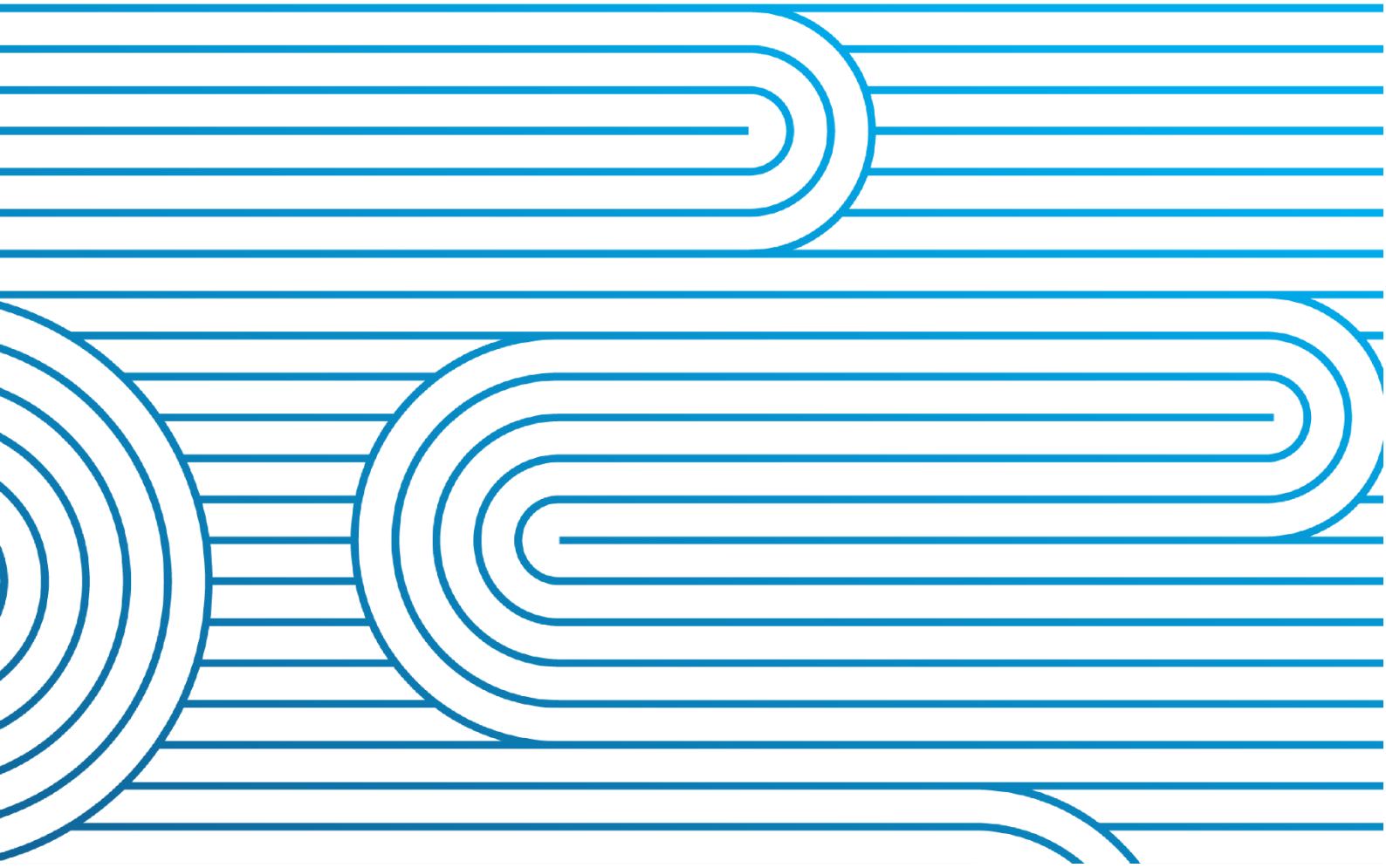
TRANSPOWER

Renewable Energy Zones

Summary and analysis of submissions received from the 2022 National Consultation and Northland Pilot Concept Consultation

31 May 2022



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Introduction

1.1 Renewable Energy Zones

This document summarises the feedback Transpower received from the consultation phase on the Renewable Energy Zones National Consultation and the Renewable Energy Zones Northland Pilot Concept. The two consultations are interrelated, and we consulted on them at the same time.

For the purpose of the consultation, we defined a Renewable Energy Zone as 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.

Renewable Energy Zones have not been developed in New Zealand before, and Transpower sought feedback from interested parties to explore the concept and the potential for developing Renewable Energy Zones for New Zealand and for Northland, as a pilot.

This document gives a high-level summary of the submissions received from both consultations and identifies some of the key feedback themes observed. It is organised according to the questions in the consultation paper. It is not intended to be comprehensive, rather, it offers a general overview. Any respondents mentioned in this document are used by way of example and are not necessarily the only parties who made a certain point. The views set out in this paper should not be relied on as Transpower's final position.

1.2 What we did – consultation process

Transpower sought feedback on the concept of Renewable Energy Zones from a wide range of stakeholders via two consultations that ran simultaneously from 28 February 2022 to 8 April 2022. The two consultation documents are listed below:

- Renewable Energy Zones National Consultation
- Renewable Energy Zones Northland Pilot Concept (released in partnership with Top Energy and Northpower)

Consultation responses could be provided either by email or submitted via an online form. The consultation questions are provided in the Appendix.

In our consultation documents, we asked for feedback to:

- **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.
- **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.
- **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.
- **Seek feedback** from Northland stakeholders on the potential for a Northland Renewable Energy Zone to pilot the concept in New Zealand.

A communications campaign supported the consultation to ensure a wide range of stakeholders were aware of it and had the opportunity to take part. This comprised of:

1. Information published on the websites of Transpower, Top Energy and Northpower on 28 February 2022.
2. Media releases issued by Transpower, Top Energy and Northpower on 28 February 2022.
3. An email to stakeholders sent on 28 February 2022.
4. Two online webinars focused on the National Consultation (8 March 2022) and the Northland Pilot Concept (31 March 2022).
5. Social media posts on the Transpower, Top Energy and Northpower Facebook pages and the Transpower LinkedIn page through March 2022.
6. Advertisements in the Northern Advocate, Northland Age, Northern News and Bay Chronicle during March 2022.
7. Meetings with several generation developers, EDBs and key stakeholders including Northland councils and iwi.

1.3 Summary of responses to the consultation

A total of 129 responses were received, 65 responses by email and 64 via our online form. Of those who responded, approximately two thirds were on behalf of an organisation.

54 were for the Renewable Energy Zones National Consultation and 75 were for the Renewable Energy Zones Northland Pilot Concept Consultation. Note that some respondents have responses on either one, or both consultations in their submission. For example, one submission may have responded to both consultations, and we refer to this as two responses.

In total there were 99 respondents (a list is included in the Appendix). These represent the views of a wide range of individuals, energy sector participants, businesses, iwi and hapū, local and central government, advocacy groups, and industry bodies.

Submissions were divided into the key groups identified in Table 1.

Table 1: Number of responses by group and consultation

Group	National Consultation	Northland Pilot Concept	Total
Central government	1	0	1
Community organisation	3	6	9
Distribution	6	2	8
Environmental group	3	7	10
General public	8	35	43
Generation developers and operators	10	5	15
Gentailers /Retailers	8	5	13
Industry and large energy users	3	0	3
Industry associations, advocates, and consultancy	9	5	14
Iwi or hapū	0	4	4
Local business	1	2	3
Local government	1	4	5
Research institute /academia	1	0	1
Total	**54**	**75**	**129**

Respondents were free to choose which parts of the consultation to answer. Most chose to answer all of the questions. Some chose to answer some but not others, so the number of responses to each question can vary.

All submissions received have been posted on our website at www.transpower.co.nz/REZ. Contact details of individual respondents have been redacted.

1.4 He mihi ki ngā mana whenua

As part of our efforts to engage with mana whenua Transpower reached out together with Top Energy and Northpower, to various representative iwi groups. Accordingly, we were pleased to receive several submissions from such groups as part of our consultation. While we have included their kōrero in general terms within the rest of this summary, we also thought it important to particularly acknowledge their submissions, given our own commitment to the principles of Te Tiriti.

The nature of the feedback received reflect themes around the connected nature of Te Ao Māori (the Māori world), and their expectations as tangata whenua under Te Tiriti (the Treaty of Waitangi).

1.5 Approach to submissions analysis

The concept of Renewable Energy Zones was consulted on both nationally and for the Northland Pilot Concept. The two consultation documents included a number of questions across several topics. Some of the questions sought 'yes or no' answers, while most of the questions sought more qualitative responses. For questions where we have sought to quantify and a response was unclear or invalid to the question asked, we have filtered these as non-specified responses. For responses where no response was provided (i.e., blank) these are excluded completely from the set of responses and analysis.

A bottom-up approach was used by Transpower analysts to first read the responses in whole, code the responses by keywords and points for each question separately. This meant analysis was guided by the content. Respondents have used words interchangeably in their responses. For example, the use of keywords such as 'network', 'grid', and 'transmission'. Transpower has taken a wide rather than narrow interpretation of the meaning of words used.

This submissions analysis therefore largely focuses on the key themes to emerge in submissions, as not all questions were quantifiable. In describing the findings, qualifiers such as 'almost all', 'most', 'many', and 'a few' are used to show where there was agreement across many respondents or where a view was held by a small number of respondents.

Where points raised in the feedback that are repeated or mentioned across multiple questions on a similar section (for example Questions 10, 11 and 12 discuss the challenges identified in the Consultation Document), we have allocated responses under the relevant question for consistency and comparison.

Transpower's approach to the survey questions were designed in a way that intended to provide flexibility for unrestrained and free responses to the questions and gain a greater depth of insight and understanding with respondents. As all questions were open-ended and allowed for open-text responses, this however has limited the level of analysis due to the unstructured nature of the feedback. Therefore, in some cases the interpretation of responses in our analysis may vary.

2
Executive Summary

2.1 Overview of submissions

This section presents a summary of feedback received from submissions relating to the National Consultation and Northland Pilot Concept.

The overarching key points and themes we heard across both consultations, include:

- Most respondents supported the concept of a Renewable Energy Zone and support for development of a Renewable Energy Zone pilot in Northland.
- Respondents broadly agreed with the challenges of first mover disadvantage and high connection costs, but some required further evidence and analysis on the issues.
- Respondents supported realising a broader scope and greater number of benefits, including social and economic benefits for Northland.
- Some respondents preferred changes to the customer and consumer guiding principles.
- Respondents broadly supported the proposed criteria for selecting suitable regions.
- Respondents identified local community, iwi and international stakeholder engagement and collaboration is key to inform and support Renewable Energy Zones.
- A tender process is supported in principle, but alternatives were suggested.
- Electricity distribution businesses and Transpower are expected to play a role in co-ordinating Renewable Energy Zones.
- Respondents raised several challenges and potential approaches to Renewable Energy Zones (see Section 3).
- Additional costs to develop Renewable Energy Zones should not fall on local consumers.
- Respondents are generally supportive of investment in transmission and distribution infrastructure, but REZ should consider alternatives.
- Some respondents urged avoiding areas of environmental, historic and cultural significance
- Several development projects were noted in responses.

This document is not an exhaustive summary of stakeholder feedback, nor of Transpower's current views on the Renewable Energy Zone concept. The summary and analysis set out in this paper should not be relied on to indicate Transpower's final position and will be one of several inputs into our work on Renewable Energy Zones.

All submissions received have been posted on our website www.transpower.co.nz/REZ. Please refer to the submissions for further detail. We appreciate the feedback we received.

2.2 Main submission points and themes

This section presents a summary of the main submission points and themes received from submissions relating to the National Consultation and Northland Pilot Concept. For detailed analysis and summary of responses by question, refer to sections 3 and 4.

2.21 National Consultation

Most respondents supported the concept of a Renewable Energy Zone and pilot

Most respondents agreed that the concept of a Renewable Energy Zone could be beneficial in New Zealand. When asked for feedback, approximately four out of five responses provided partial or full agreement. Many reasons were given as to why, but a sense of importance on unlocking renewable energy from a range of developers and renewable technologies and addressing climate change and decarbonisation were prominent response themes.

Many respondents supported the Far North/Northland and Taranaki regions as being the most suitable regions, with more than half of respondents to the consultation question supporting the Far North/Northland region above other regions. Reasons given were the high amount of renewable solar and wind resources, interest from developers and proximity to Auckland as well as the benefits highlighted in the responses to the Northland Pilot Consultation. Respondents highlighted the potential to scale and replicate the pilot across New Zealand. Respondents pointed out several other suitable regions, which also had high-quality and untapped renewable energy resource potential. Some respondents argued that a transparent process and appropriate due diligence is critical to determine the best region prospects.

Respondents broadly agreed with the challenges, but some submitters required further evidence and analysis on the issues

Most respondents discussed the challenges of first mover disadvantage and high connection costs for connecting new renewable generation and large electricity loads to the network. We heard from respondents that these issues are well known but that most agreed they should be addressed, particularly as demand for renewable energy generation increases and load growth due to electrification occurs.

One underlying concern was the need for further analysis to define the problem definition and issues that Renewable Energy Zones was seeking to address. We heard from several respondents who expressed concern that the benefits or drawbacks of the concept were not clear and had not been properly assessed. For example, the need for evidence on the nature and extent of the market failure being addressed, the costs and benefits of the concept and if it is better than other alternative options. Similarly, some respondents felt that the existing connection queue backlog was the real issue. Respondents suggested work be undertaken to identify risks and impacts on the wider energy system to ensure that it does not create a barrier itself or disadvantage non-Renewable Energy Zone activity by participants occurring in the energy market.

A major concern was uncertainty about the final form of the new Transmission Pricing Methodology (TPM), which respondents perceived as likely to have implications for Renewable Energy Zones. The Electricity Authority published the new TPM shortly after the end of the consultation period, on 12 April 2022, and it will take effect from April 2023.

Respondents supported realising a broader scope and greater number of benefits

When asked what benefits should be considered in the decision-making process respondents supported a reduction in electricity costs to consumers, potential to boost regional economic development and socio-economic wellbeing, the creation of local employment and the decarbonisation and climate change benefits of renewable energy. A number of respondents explicitly asked for a wider scope on benefits rather than an economic purity lens. Respondents were interested in benefits beyond the one-off investment in the project assets and infrastructure. For instance, benefits should be transitionary and sustainable for the local community such as skills development, job creation, improve socio-economic outcomes and boost economic development.

Some respondents preferred changes to the customer and consumer guiding principles

Most responses agreed with the guiding principles, except a few who did not agree with principle two 'REZs are customer driven'. We heard from some respondents that Renewable Energy Zones should be driven from a national system planning approach, rather than entirely driven by the market through demand from generation developers or load customers. Respondents also pointed out that a customer centric approach (and to some extent the region selection criteria), should consider diversity of supply. For example, the potential to concentrate generation sites in particular geographic areas has unintended consequences. Criteria may favour clusters of the same-technology generation with uniform development times, thereby increasing the risk of wind and solar generation experiencing simultaneous high or low outputs.

Others noted that principle three 'local consumers will be no worse off' should be strengthened to expressly ensure that consumers are better off as a result of developing Renewable Energy Zones. While lower costs for consumers were important, many respondents discussed the wide range of benefits to local communities and consumers beyond simply lower electricity costs. Several principles such as principles three and four were also endorsed from those who responded to the Northland Pilot Concept.[1]

Respondents broadly supported the proposed criteria for selecting suitable regions

Many respondents pointed out that all six proposed criteria for selecting suitable regions for Renewable Energy Zones development should be included. We heard from respondents on suggested changes and additions to some of the principles. A key issue raised by respondents was the need for the criteria framework to be well established and in place before selecting a Renewable Energy Zone. A few respondents asked that the criteria does not conflict with or unduly favour the decision on selection of the proposed pilot region of Northland. For instance, the criteria needs to have elements of fairness, transparency and be fit for purpose. A few respondents explicitly asked how certain regions with low developer interest, but high renewable energy potential or energy load would be assessed. Such as, offshore wind in Taranaki or the regional energy transition work for process heat by Government

Respondents identified the need for local and international stakeholder engagement and collaboration to inform and support REZ

Many respondents identified the need to ensure there is strong engagement and collaboration with the local community, iwi, hapū and other local groups. While this was identified as a principle

[1] Principle Three: Local consumers will be no worse off as a result of developing a REZ.
Principle Four: REZs are developed through partnerships and collaboration with local iwi and stakeholders.

in the consultation, there was a strong and evident point made several times across many of the responses that this principle should be further strengthened.

A major opportunity identified many times by respondents was the useful learnings and insights from what is being undertaken with the different Renewable Energy Zone models being deployed in Australia.

A tender process is supported in principle, but alternatives were suggested

Many respondents supported the use of a tender process following an expression of interest for committing projects in a Renewable Energy Zone. The main reasons provided were benefits of formalising a process that included elements of transparency, fairness and competition. Several respondents agreed that a tender process would be a useful way to co-ordinate and attract interest, and test both near term and long-term commercial aspirations from interested parties. We heard several alternatives presented that sought to address the current access regime for connecting to the grid and the various models for funding and cost recovery. Some respondents argued that alternative commercial models should be explored first before implementing Renewable Energy Zones to see if similar co-ordination and lower cost outcomes could be achieved. Some of the alternative approaches pointed out by respondents included a focus on enhancing and developing multi-party commercial arrangement models, government funded models, reverse auction mechanisms, improving existing programmes (e.g., Net Zero Grid Pathways) and streamlining the connection process for all grid customers.

Some respondents expressed concern that a tender process may be administratively costly and might unduly influence and favour certain market participants and generation or load projects. For instance, there was concern it may crowd out certain players and small-scale generation projects. Similarly, there is a risk that land is purchased around prospective or established Renewable Energy Zones during the early stages to 'land bank'. Others wondered if they would still be required to follow the existing economic and regulatory processes, such as the investment test for transmission infrastructure investment. Several suggestions were provided to engage and learn from the current tender processes undertaken in Australia for Renewable Energy Zones.

Electricity distribution businesses and Transpower are expected to play a role in co-ordinating REZ

Many respondents expect that both electricity distribution business (EDBs) and Transpower would be involved in co-ordinating the Renewable Energy Zone process, so long as they remained impartial and objective. However, the extent of the role was not clear and there were opposing views. Some respondents felt an independent entity should be responsible as the co-ordinator. A few responses noted the difference between roles such as facilitating and centralised planning. However, it was implicit from almost all respondents that they wished to be involved in the process. This includes tangata whenua, iwi and stakeholders from, local government, environmental and community groups, developers, local businesses, consumers, landowners, and non-governmental organisations.

It was argued in some responses that an independent entity or group could better meet the needs of investors in generation or load, while allowing network companies to focus their resources on core responsibilities of upgrading and building grid infrastructure. Further, EDBs are likely to have limited resources to serve the needs of large generation or load investment.

Most respondents agreed with the proposed project selection criteria, and we heard some suggestions from respondents to make improvements and changes of certain principles. Common themes from respondents included the need to develop better clarity of the selection criteria and

how the criteria align with or would meet existing market design and regulatory requirements. A few respondents suggested that the criteria should be considered in a sequential manner. A major point of caution from a few respondents was that it could be too premature to determine project selection criteria at this stage, considering the need to understand the potential overlaps with other workstreams such as the new Transmission Pricing Methodology.

Respondents raised several challenges and potential approaches to Renewable Energy Zones

When asked for feedback on challenges and opportunities, we received many responses. Broadly, respondents agreed with the challenges identified in the consultation document however there were a range of views on ways to overcome these challenges. Many respondents agreed that the current open access regime for transmission represents a risk for new generation projects, however there were mixed views on whether open access was appropriate or not, whether Renewable Energy Zones should be treated the same as non-Renewable Energy Zones or that a balance be struck between the existing open access rules and the rules to be put in place for Renewable Energy Zones.

A common theme identified amongst respondents was the challenge of alignment and timing of network infrastructure and the corresponding renewable energy generation and load investment decisions and project delivery. Similarly, the challenge to address co-ordination of planning and consenting for multiple projects within the same zone. Similarly, a major issue where there is a 'waterfall of development failures' in a situation where projects are delayed, or developers pull out and how the resulting costs and risks are managed.

A large number of responses felt that a greater level of flexibility would be needed under a Renewable Energy Zone model to allow for second movers or future projects to be added, such as new generation or battery storage.

Respondents pointed out the challenges of clustering large amounts of variable renewable energy generation on the energy system, such as managing intermittency and security of supply. A common suggestion from respondents was the need for balancing assets such as storage, dispatchable generation and demand side management to address the intermittency issues.

One underlying concern from respondents was that the consultation was too focused on generation and required a focus on demand. Many respondents noted the need to address the challenges of renewable load and suggested significant benefits are achieved when there is existing and/or anticipated future local load, either part of or close to the Renewable Energy Zone. Challenges of how the 'renewability' of a load customer needs to be assessed. For example, how would a fertiliser factory connecting to the Renewable Energy Zone be treated – as renewable or non-renewable?

Several respondents argued for anticipatory investment in transmission and distribution network capacity ahead of need, particularly to address existing capacity issues. This would enable a faster shift towards a more renewable and decarbonised energy system which Renewable Energy Zones sought to achieve.

A key opportunity highlighted by respondents was the need to ensure economically efficient outcomes and consider both traditional poles and wire solutions and non-network alternatives. Similarly, the use of existing grid infrastructure and assets and leveraging non-electricity network infrastructure (e.g., roads, ports, gas infrastructure) would be advantageous.

Some respondents suggested the need to further stocktake and map the relevant regulatory issues given one of the principles of the concept is to make minimal changes to the existing electricity

regulatory framework. For example, Part 6 of the Electricity Code for 'Connection of distributed generation' for Electricity Distribution Businesses has specific roles for EDBs.

Respondents noted the inter-relationship with environmental legislation, roles and responsibilities under it, and need to protect the environment. Many respondents raised issues in relation to matters that are addressed through existing environmental legislation, including the Resource Management Act 1991 (RMA), and the resource management reform that is underway.

Matters raised included the role of councils, iwi and communities, and the need to avoid and protect areas of biodiversity, historic and cultural significance, and concerns about visual impacts. The role of regionals spatial strategies (under the current or future legislation) in identifying suitable areas for Renewable Energy Zones was also recognised by respondents.

Some respondents raised concerns about the inter-relationship between Renewable Energy Zones and the environmental legislation, others raised issues about duplication or dual considerations. Some respondents suggested the need to further stocktake and map the relevant regulatory issues given one of the principles of the concept is to make minimal changes to the existing electricity regulatory framework. Many respondents strongly urged the need to work closely with the regulatory bodies in the designing of the Renewable Energy Zone concept.

2.22 Northland Pilot Consultation

Respondents provided support for development of a Renewable Energy Zone pilot in Northland

Most respondents supported the development of a Renewable Energy Zone in Northland, with approximately four out of five responses providing partial or full support. Many reasons were given as to why. Northland was perceived having strong renewable energy resources from solar and wind which would enable renewable electricity generation to be unlocked, the potential for local regional economic benefits from attracting investment and industry, employment opportunities, skills development, and the potential for lower electricity costs to consumers including reducing energy hardship. Some respondents expressed concern on the aesthetic impact on the land and surrounding environment, the potential for electricity costs to increase and negative flow on impacts for local distributed electricity generation projects. A few respondents also questioned the problem definition and felt the issues, in part, appeared to be driven by the volume of connection requests.

A wider set of enduring social and economic benefits should be considered for the Northland region

It was clear from responses that a wider set of social, economic, cultural, and environmental benefits should be considered beyond the energy system. The departure of several major industries highlighted the opportunities for development and transition of industry and people. Respondents also suggested the creation of a centre of excellence for skills workers to access training and develop renewable energy skills. It was suggested by respondents that working in partnership with community groups, iwi and hapū should be encouraged and supported to contribute to the Renewable Energy Zone success, through land use, investment, or skills and training.

Additional costs to develop Renewable Energy Zones should not fall on local consumers

Several potential costs were listed by respondents. The key themes that emerged included higher costs for consumers (both line charges and the cost of the network investment), the impact on the natural environment and land use, societal and community impacts including economic impacts on the region and impacts on local culture, tangata whenua, iwi and hapū.

We heard from several respondents that additional costs should not fall on local consumers, particularly those in Northland. A critical point made by respondents was the high level of community deprivation, energy poverty and socioeconomic challenges in the Northland region, particularly felt by those in rural or remote areas, or by Northland tangata whenua. Respondents suggested these considerations needed to be factored into the broader thinking of Renewable Energy Zones. Many respondents strongly argued that higher electricity costs from Renewable Energy Zones should not fall on local consumers, as Northland already pays some of the highest electricity prices in New Zealand. A few respondents were concerned with the potential scenario where a Renewable Energy Zone failed, and local consumers within the region are left with the cost.

Respondents preferred strong engagement and collaboration with community and iwi

It was strongly evident from respondents the need to ensure that the local community, Northland tangata whenua, hapū and iwi, are well engaged through the Renewable Energy Zone process. Similarly, respondents noted the importance of fairness and equity, and to ensure that local stakeholders including iwi are not precluded from participation in the development of a Renewable Energy Zone, for instance, being outbid by large corporate entities or restricted through 'land banking'.

Respondents are generally supportive of investment in transmission and distribution infrastructure, but REZ should consider alternatives

In principle, most respondents supported enabling development through upgrades to existing lines and substations as demand for connections to the network emerge. A list of alternatives was proposed by respondents on this topic. There was mixed feedback from respondents on whether investment in transmission infrastructure should follow anticipatory investment (building transmission infrastructure ahead of need), or rather, 'just in time' investment to meet demand as it occurs.

While respondents generally agreed that investment will need to occur, a point that emerged from a few respondents was the need to ensure alternatives for transmission and network investment where possible. For instance, respondents pointed out that upgrading existing infrastructure could be supplemented by options such as non-network alternatives and use of existing infrastructure and corridors. This approach was perceived as more efficient and cost effective than only investing in new greenfield infrastructure. Similarly, some respondents were interested in whether Transpower, Northpower and Top Energy would consider other emerging technologies, network alternatives or non-network solutions in their approach for a lower footprint, more economically efficient and lower overall system cost.

A large number of respondents felt that Renewable Energy Zones should include the use of distributed energy resources or stand-alone community networks such as small-scale electricity generation such as rooftop solar.

Some respondents urged avoiding areas of environmental, historic and cultural significance

A number of locations were put forward by respondents for locations where new lines needed to be built to connect resources. A key concern was the environmental and visual impacts of the investment in network infrastructure. While it was recognised as more expensive there was a preference for undergrounding electricity lines to minimise impacts. Other suggested approaches included avoiding areas of environmental, historic, and cultural significance and building new electricity transmission infrastructure along or near existing infrastructure, such as road corridors. Some respondents did recognise existing environmental legislation and frameworks that are relevant, including the RMA.

Many respondents highlighted that the Far North/Northland has many areas of environmental and cultural significance for hapū and iwi. Some other respondents identified that engagement with the local community would be critical to understand these areas of importance, to avoid the potential for community opposition.

Several development projects were noted in responses

Several development opportunities that a Renewable Energy Zone could support were provided by respondents. Many respondents noted that there are a range of investment opportunities and development projects that are in various stages of planning or commissioning. Some respondents felt that a Renewable Energy Zone would assist to unlock or bring forward many of these projects.

3

Summary and analysis of National Consultation

This section includes what we have heard from submitters' responses against the 12 specific questions asked in the consultation document; plus any general comments of relevance to specific questions.

This document is not an exhaustive summary of stakeholder feedback, or of Transpower's views or position on the feedback received during the consultation process.

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?

Most agreed that both the first mover disadvantage and high connection costs are challenges for connecting new renewable generation and large electricity loads to the electricity network (n=41). Many respondents acknowledged these were well known issues with the funding and regulation models for developing electricity network infrastructure and these are likely to become more material in the context of the energy transition to increase the amount of renewable energy generation and electrification of load. Some respondents referenced other energy markets globally where this is a common issue and instances where this has been an issue in New Zealand.

Respondents' general reasons for addressing both these challenges, particularly from those who provided support, include:

- improve economic outcomes from multiple parties sharing the electricity network cost.
- reduce barriers for increased entry from developers of renewable energy generation and electrification of load.
- encourage decarbonisation of the New Zealand energy sector to achieve net zero outcomes.
- facilitate investment to build transmission infrastructure more efficiently and at pace.
- better co-ordinate connection of generation or load in a region, particularly in areas which have limited capacity.
- encourage different types and sizes of generation and load to connect to the transmission grid, particularly smaller scale projects which may not be economic on their own.

Several respondents suggested the need to address not only the challenges for connecting new generation, but equally the challenges for connecting large energy user loads. For example, this this can reduce overall costs to energy users in a transitioning system with higher levels of electrification.

Of the few that disagreed or expressed concern, the main issues were the need to better define the problem definition that Renewable Energy Zones were looking to address and the need to provide more evidence and analysis on the nature and extent of the issues. For example, some respondents felt that high connection costs seem to be a symptom of first mover disadvantage and not a separate problem.

Several respondents argued that the Electricity Authority's Transmission Pricing Methodology (TPM) will likely solve the first mover disadvantage. Many of the respondents, particularly those who did not agree, had a preference to understand the decision of the Transmission Pricing Methodology first and its impact on the Renewable Energy Zone concept. Others noted that transmission costs are just one component of the total cost and whether decisions for investment in renewable energy projects go ahead is often based on a range of factors.

On 12 April 2022, after we closed our consultation period, the Electricity Authority announced its decision to adopt a new TPM. The new TPM includes mechanisms intended to address first mover disadvantage for connection assets and will take effect from April 2023.

Some of the ways in which respondents may overcome first mover disadvantage and high connection costs are further explored in Questions 10 and 11.

Q2	Do you think the concept of a Renewable Energy Zone could be beneficial in a New Zealand context?

Most agreed that the concept of a Renewable Energy Zone could be beneficial in New Zealand, with approximately four out of five responses expressing partial or full agreement.

The most common themes of support according to respondents were addressing climate change and meeting decarbonisation goals, unlocking renewable energy generation, better co-ordination and planning, potential for lower electricity costs to consumers including wider economic benefits and increased resilience and security of the energy system. Where respondents provided reasons for support, these were broadly consistent with the benefits identified in Question 4. We noted in responses that many respondents were supportive of Transpower further investigating the concept of Renewable Energy Zones.

Despite the broad agreement and reasons for support, several respondents expressed concern about the lack of information in the consultation document to assess whether or not the concept would be beneficial. For example, the need for evidence on the nature and extent of the market failure being addressed, the costs and benefits of the concept and if it is better than other alternative options. Some respondents felt that further investigation in these areas would be required in order to better understand the benefits.

Other comments included the need to ensure Renewable Energy Zones avoids any unintended consequences, such as favouring certain technologies or participants in the market, impacts on the wider energy system and that creating a Renewable Energy Zone does not create a barrier in itself (e.g., favouring Renewable Energy Zone projects over non-Renewable Energy zone projects).

A number of alternative approaches have been proposed by respondents to the concept of Renewable Energy Zones which we have included in Question 7 and 11.

Q3	What region(s) do you think would be suited to Renewable Energy Zones?

Respondents suggested that the Far North/Northland and Taranaki regions are the most suitable for Renewable Energy Zones. Of the total respondents (n=47), approximately half of respondents supported the Far North /Northland and a quarter of respondents supported Taranaki. A number of other regions including Waikato, Southland, Bay of Plenty, Hawkes Bay, Wairarapa and Central North Island were also proposed but received fewer responses.

The main reasons for supporting these regions include:

- High levels of renewable energy resource (wind, solar and geothermal).
- Proximity to major existing load centres, particularly in the North Island which are further away from existing hydro generation in the South Island.
- Adequate levels of interest from developers to build generation projects in the region
- Regions that are located on the 'edge' of the national grid to utilise existing nearby capacity and grid assets.

Generally, respondents indicated that the Far North and Northland regions were a logical first step for a pilot, and that the learnings and outcomes would enable it to be replicated or scaled across New Zealand. Respondents highlighted the regions' solar and wind renewable resources, interest from developers and proximity to Auckland (a large load centre), as well as the benefits highlighted in the responses to the Northland Pilot Consultation (see Section 4).

A few respondents noted several other regions than Northland to be considered for a Renewable Energy Zone. Specifically for the Taranaki region, several respondents argued that onshore and offshore wind resources, future opportunities for green hydrogen and the existing local infrastructure and workforce provide a unique opportunity. A similar theme emerged for other regions that had untapped and high-quality renewable resource potential, such as solar or geothermal.

Many respondents also noted the importance of efficiently using existing grid infrastructure and assets to optimise the level of investment required for a Renewable Energy Zone

Several respondents suggested that consideration of wider infrastructure beyond electricity transmission and distribution should be considered. These include road, rail, water, and gas pipelines and co-location of complementary resources such as other forms of flexible generation and alternative fuels for demand such as biomass. Similarly, a few respondents suggested that arrangements for regions where there is potential for groups of existing consumers wishing to electrify (e.g. industrial process heat) or potential for new end uses of electricity such as green hydrogen should be factored into the region selection.

Some respondents argued the need for a fair and transparent process to determine the regions that should be selected for a Renewable Energy Zone, and to ensure appropriate analysis has been undertaken to establish the best prospects for the highest value regions. A few respondents noted the need for factoring in a forward view of growth to meet current and future needs from

households and businesses within distribution networks, and changes to the energy system, such as closure of lumpy load from thermal generation that will free up grid capacity.

Q4	What benefits do you think should be considered in the decision-making process for Renewable Energy Zones in New Zealand?

Respondents suggested more than twenty benefits that should be considered in the decision-making process for Renewables Energy Zones in New Zealand. The benefits most supported were, a reduction in electricity costs to consumers (n=26), the potential to boost regional economic development (n=19) and the creation of local employment (n=18). A few respondents also suggested the decision-making process should include consideration of the wider socio-economic and wellbeing benefits that a Renewable Energy Zone could provide (n=13), and the positive outcomes that could be created for tangata whenua and iwi (n=9).

Several of the responses suggested that wider social and economic benefits are considered beyond just the energy system, rather than simply an economic or financial test. For example, benefits should be transitionary (e.g. skills development, creation of new jobs) and sustainable (e.g. ongoing benefits, multiplier effects) for the region beyond the one-off investment in infrastructure.

Several respondents also suggested that security of supply (n=10) and consideration of the resilience of the electricity system (n=14) should be considered through the Renewable Energy Zones potential to unlock or provide an impetus for renewable energy projects (n=17).

Many respondents also felt that consideration should be given to the decarbonisation and climate change benefits of renewable energy (n=17).

Some respondents suggested that further analysis is required to better understand the benefits. Others suggested that disadvantages should have been explored as a question in the consultation and expressed concern regarding the actual benefits that would be realised from a Renewable Energy Zone.

Q5	Do you agree with the proposed guiding principles? Are there any that you would change or add?

Most responses agreed with the proposed guiding principles, except for principle two with which fewer responses agreed.

Principle 1: REZs are built to harness and unlock renewable energy resource

Most respondents agreed with this principle.

The most common theme was for the need to expand renewable energy generation to help New Zealand to meet its climate change and decarbonisation goals.

Principle 2: REZs are customer driven

Many respondents supported principle number two. Respondents suggested that for a Renewable Energy Zone to be successful it must be in areas of high developer interest otherwise there is a risk of creating a mismatch with investor appetite and delivery.

However, approximately six respondents did not support principal two. We heard from some respondents that REZ should be driven from a national system planning approach, rather than entirely driven by the market through demand from generation developers or load customers. Reasons given from respondents include changing the definition to focus solely on the areas of lowest cost energy supply and highest resource potential rather than driven by developer interest for generation or load. For example, to facilitate the development of renewable energy may require the need for a national system planning approach rather than being entirely driven by the market (or a balance between the two). This national system approach would ensure that transmission infrastructure and capacity is strategically replaced in a timely manner and long-term demand and decarbonisation goals can be met.

It was commented by a few respondents that taking a customer centric approach where it is customer driven and only built where there is clear demand from generation or load developers would risk favouring certain technologies. It was argued that it may risk favouring clusters of the same-technology generation with uniform development times. For example, the opportunity for renewable generation from offshore wind off the coast of Taranaki is far greater than the current domestic demand. Additionally, the risk would be that investment decisions related to grid connection for onshore wind developers (3-5 years development time) and offshore wind developers (8-10 years development time) would struggle to align. In this situation it is argued that the demand would not exist prior to the development of the generation and may therefore disadvantage a Renewable Energy Zone development proposal. Concentrated clusters of the same generation with specific variable renewable energy characteristics (e.g. intermittency of solar or wind) could impact on the wider energy system.

Renewable Energy Zones may work best when there is existing and/or anticipated future local load within or close to the Renewable Energy Zone. For example, this will support the social licence that is gained from the creation of enduring industry and jobs in the region where the Renewable Energy Zone is located. There may also be an opportunity where local can help overcome concerns around a 'sugar hit' – which is where there are a lot of construction jobs when a REZ is developed but all the opportunities drift away once the renewable energy projects and transmission is up and running.

Principle 3: Local consumers will be no worse off as a result of developing REZ

Most respondents agreed with this principle, with some respondents suggesting it could be strengthened. A few strong comments were received from certain respondents on this topic.

A number of respondents suggested that the principle should go further than simply lowering cost outcomes for consumers when considering total system costs (energy, transmission and distribution). For example, the principle should be more ambitious to make consumers better off through any transitionary development period as well as post development. This was noted of particular importance in regions with high social and economic deprivation and high electricity prices, such as Northland.

It was highlighted that the long term interests of end users will be best promoted by a Renewable Energy Zones development framework that expressly seeks to achieve least-cost outcomes (not just lower cost) and maintain competitive neutrality. To achieve this, the framework should consider both traditional poles and wires solutions and non-network alternatives when identifying

potential technical network solutions that could service Renewable Energy Zones. One respondent believed that local consumers should be replaced with "local and NZ wide consumers".

Principle 4: REZs are developed through partnerships and collaboration with local iwi and stakeholders

Most respondents agreed with this principle. Many responses strongly supported the need to partner and collaborate with local communities, iwi and hapū and to ensure these parties have a meaningful voice and opportunity in the Renewable Energy Zone process.

Some respondents suggested the meaning of 'stakeholder' could be clearer and strengthened. For example, the focus should not just be on single customers as this was an individualistic concept and should include a broader definition including communities and many end users. There is an opportunity for engagement and community benefits to be integrated and formalised in the partnership using an agreement. They explained that this would create long lasting value for the regional beneficiaries and maintain social licence.

Principle 5: REZs deliver net benefits to Aotearoa's electricity system

Most respondents agreed with this principle. A few respondents argued that the cost benefit analysis needs to have a wider remit and include a greater number of benefits, than a simple regulatory investment test (e.g. CBA).

Principle 6: REZ location and REZ participant selection are done via a transparent methodology

Most respondents agreed with this principle.

Some respondents suggested end users should have a strong input into the selection process, and that further information is needed for interested parties such as electricity consumers to provide meaningful and informed input.

Respondents would also like to see consideration given to incorporating a resilience lens for natural hazards and climate change risks. It suggested amending principle six to include a reference to partnerships with local authorities to connect the Renewable Energy Zones with spatial plans (such as Regional Spatial Strategies).

Principle 7: REZs are enabled with minimal changes to the existing electricity regulatory framework

Most respondents agreed with this principle, and that alignment with existing regulatory frameworks would be standard.

However, several developers and consultants suggested that changes would be required to the existing electricity regulatory framework for a Renewable Energy Zone concept. They suggest this was the case in Australia, where several major changes to the regulatory regime were required to enhance the value proposition to participants. This is recognised as important since the value proposition requires developers to take on risk without reward. Similarly, a firm contractual benefit is a barrier. Solving the contractual problem with 'paying for a service' and then potentially being 'denied that service' should be considered.

Other comments provided by respondents included:

- the addition of a principle to address protecting and enhancing the natural and built environment such as landscape, biodiversity and water resources.

- the need for a future focus and enduring benefits to the local and regional community and businesses are included as a principle, for example mandating local employment to create jobs in the region where the Renewable Energy Zone is located.
- ensuring Renewable Energy Zone aligns with current network and grid planning principles and processes and is part of wider government work programmes, such as the national energy strategy and regional planning.
- addition of a new principle for an access scheme to improve investment certainty for renewable energy developers, to address the current challenges faced under open access. This can be introduced in the form of an 'access scheme' and transparent tendering process with specific selection criteria.

Q6	Do you agree with the proposed criteria for selecting suitable regions for REZ development? Are there any that you would change or add?

Most respondents agreed in principle with all the proposed criteria for selecting suitable regions for Renewable Energy Zone development.

Several respondents suggested that that both the first three proposed criteria that should be considered and the last three other proposed criteria that could be considered ought to be all together considered as base criteria in the selection process.

When asked for feedback, respondents provided several areas to change or add criteria:

Generation developer demand

Several respondents suggested that this criterion only partially addresses the broader concept of a Renewable Energy Zone. For example, a developer noted that many of the Renewable Energy Zones around the world are focussing on unlocking renewable energy potential in the long term, rather than just creating access for developers who have identified a region.

An industry association drew the connection between 'significant numbers of renewable energy developers' as a function of the other criteria 'access to good renewable resource', with both being strongly interlinked. It was not clear to some respondents what 'significant' meant in terms of generation capacity, and whether this includes small scale electricity generation.

Several respondents argued that the criterion should not be limited to generation and should include specific criteria for demand. For example, a renewable Energy Industrial Cluster (REIC) could include both generation and new load by industrial consumers.

Economically efficient network investment

There could be the opportunity to consider non-network solutions when analysing new investments. For example, scale commercial distributed generation can delay or avoid infrastructure investment and improve the resilience of a network.

One respondent believed that efficient network infrastructure should be considered on the basis of $/MWh delivered as opposed to $/MW of generation capacity.

Network capacity in the region

A few respondents believed that network capacity in a region is not a main criterion and Renewable Energy Zones need to be transmission connected first and then give consideration to how you can utilise existing local network corridors to upgrade and augment the local capacity.

One respondent questioned how this criterion would be considered in the situation in an area where significant resources could economically connect to the interconnection network.

Access to good renewable resource

Several respondents noted that this is an essential criterion and is better placed under the 'should' category instead of 'could'.

One respondent did note that site selection should consider impact of site diversity on supply security. For example, the development of Renewable Energy Zones has the potential to concentrate generation sites in particular geographic areas. This would potentially reduce the diversity across generation sites, thereby increasing the risk of wind and solar generation experiencing simultaneous high or low outputs.

Another respondent noted the high cost of land in New Zealand and that limiting Renewable Energy Zones to areas with low-cost land may limit the scope of the concept.

Potential added benefits to the grid

Several respondents strongly supported the need to consider a wider view of the benefits to the grid. For example, respondents noted the opportunity to include storage and dispatchable generation alongside intermittent and variable renewable energy. Similarly, the need to factor in the effects of climate change, natural hazards, and the need to maintain security of supply and geographic diversity.

One respondent argued that the potential added benefits needed to include wider benefits such as facilitating new load and additional social and economic benefits that could accrue. Another suggestion was to consider benefits of co-location next to existing natural gas pipelines under a future scenario that the pipelines transport green hydrogen produced from renewables.

Additional economic and social benefits

Respondents agreed with this criteria, however it was suggested there will be a need to demonstrate how the different economic and social benefits will be valued and prioritised for those involved in the Renewable Energy Zone. One respondent suggested an economic benefit was the ability to open up new energy export channels (e.g. offshore wind in Taranaki).

From respondent's submissions, we identified several suggested additions to the proposed criteria:

- Consideration given to the level of competition for generation projects in a region.
- Inclusion of biodiversity, such as fauna and species.
- Inclusion of environmental and cultural benefits.
- Securing local community, iwi and public acceptance.
- The protection of private property rights.
- Access to suitable infrastructure such as ports and roads, and other shared infrastructure.
- Consideration of complementary future infrastructure (e.g green hydrogen, electrification of certain sectors).
- Supporting housing development in a region where there is a shortage.
- Co-location and proximity to current and future load.

Some general comments were provided on the question of criteria:

Respondents suggested the need for having robust criteria framework. For example, it was not clear how the criteria would be weighted or prioritised in terms of hierarchy.

A few respondents stated that collaboration or participation with iwi and tangata whenua should be a mandatory requirement for project selection criteria.

On the selection of Northland as a pilot, one respondent believed Transpower was picking a winner and a trial is not warranted and should be made available to all regions. Others suggested that consulting on detailed selection criteria is a priority, before moving to consult on the regions that should be designated as Renewable Energy Zones. For this reason, it was unclear to some respondents why Northland should be 'first cab off the rank'. Without having evaluated Northland against other suitable regions the benefits of proceeding with a Renewable Energy Zone in Northland relative to other regions cannot be fully understood.

However, other respondents suggested that the use of selected regions would inform the planning process and the learnings could be applied generically to all other regions.

Q7	Do you agree with using a tender process for committing projects in a REZ? Are there alternative processes that could be considered?

Many respondents agreed with using a tender process that would follow an expression of interest (n=25), however there were seven respondents that disagreed. Several respondents provided alternative processes to be considered.

For those who supported using a tender process, the main reasons provided were benefits of formalising a process, transparency, fairness and competition. Several respondents agreed that a tender process would be a useful way to co-ordinate and attract interest, and test both near term and long-term commercial aspiration from interested parties. We heard several benefits of a tender process including eliciting all potential interested parties to unlock the most value and enabling it to be oversubscribed and having applicants fall out of the process and still having sufficient interest to go ahead. Several respondents suggested there are some useful learnings from what was being undertaken with the different Renewable Energy Zone models being deployed in Australia and the New Zealand Government's Regional Energy Transition Accelerator for demand being undertaken in New Zealand.

For those that disagreed with the use of a tender process, it was argued that Transpower should first seek to exhaust alternative commercial incentives to lower costs. Similarly, one respondent argued that Transpower should better define the strategic questions that underpin a Renewable Energy Zone concept before understanding whether or not a tender process would be appropriate. Another respondent suggested that it would be administratively costly.

Several respondents argued that any process should not bias certain players in the market or to certain renewable energy technologies that have different development times, investment milestones and complexity. For example, some offshore wind projects or smaller scale distributed generation projects could be excluded or crowded out. Similarly, it was suggested that the tender process could hinder small scale or committed generation whereby distribution networks have a preference for the Renewable Energy Zone connection process, and this could potentially reduce competition.

Another concern from respondents was the issue around uncertainty and alignment of timing on investment decisions. Certainty of the ability to connect to the transmission grid, the process to commit projects, collaboration and engagement, costs and timeframes for connection will be critical. These elements require significant time and upfront development well before the level of certainty outlined in the selection criteria. For example, seeking resource consent approvals and who will take responsibility for the land acquisition, planning and interface arrangements with Transpower and local networks.

Respondents also argued that price should not be overly weighted as a criterion and to unlock all potential benefits and the process would need to operate flexibly and relate to broader objectives and goals. One respondent suggested that the stage of submitting price tenders is likely to occur once all parties are clear on the expected timeframes and costs involved in establishing the connection. There is a risk that the timeframes remain too ambitious to create a level playing field. Similarly, there was a concern that proposed tender processes tend to favour established, well-financed companies with strong balance sheets and risk appetites and many potential projects led by community groups and other load customers might be inhibited.

When asked for feedback on alternative processes a few respondents suggested various approaches. For example, the use of similar schemes implemented overseas such as New South Wales and the reverse auction mechanism used in the state of Victoria in Australia.

Another alternative suggested was multi-party arrangements such as a privately led developer/generator-led model may be an alternative, at potentially a lower cost. This would envisage interested parties initiating a Renewable Energy Zone (and potentially defining their own requirements) and a REZ co-ordinator would then seek proposals.

It was suggested by one respondent that Transpower could focus on improving its existing programmes (e.g. Net Zero Grid Pathways) and streamlining the connection process for all grid customers. This would improve and streamline the connection process for all grid customers and ensure impartiality and an open platform on which generation investors can easily compete.

Other alternatives suggested included Government funded regional developments, private development supported by transmission rights and pre-emptive investment by Transpower and recover costs from future connected parties were alternatives suggested.

Q8 Who should be involved with co-ordinating and undertaking the various steps within a REZ development process?

A wide range of responses were received for this question, but certain themes were evident. Most respondents indicated that local electricity distribution businesses (EDBs) and Transpower should be involved in co-ordinating the process, so long as they remained impartial and objective. Reasons include their existing role in receiving initial enquiries for connections, technical expertise, and deep understanding of connecting generation and load, establishing the commercial and contractual arrangements, local knowledge, relationships with existing and potential customers and wider relationships with stakeholders for co-ordination and collaboration. However, some respondents felt the extent of involvement was not yet clear.

There were some opposing views and some respondents saw an independent entity to be responsible as the co-ordinator. A few responses suggested that an independent entity be

responsible as this could better meet the needs of investors in generation or load, while allowing network companies to focus its resources on upgrading and building the grid infrastructure. Others suggested regulatory oversight or a cross-organisational working group or be created to oversee the development of Renewable Energy Zones. In both instances, respondents cautioned that speed was of the essence and that additional layers could cloud or delay progress.

A few respondents advised that the parties involved in the process should not let any 'vocal minority' interfere or distract from the overall good of the initiative. A further point was made that different parties will have different roles in the various steps of the process.

The wide cross section of industries and interests captured can be seen in the responses to this question. The majority of remaining responses indicate that although small in numbers, those that have responded wish to be involved in the process going forward. This includes stakeholders from tangata whenua and iwi/hapū, local government, environmental and community groups, developers, local businesses, consumers, landowners, and NGOs.

Many also saw existing infrastructure owners and operators, and both local and central government including regional and district councils, Ministry of Business Innovation and Employment (MBIE), New Zealand Trade and Enterprise (NZTE), the Electricity Authority (EA), Treasury and others as playing an enabling role.

Q9	Do you agree with the proposed project criteria? Are there any that you would change or add?

Many respondents agreed with the proposed project criteria (n=30).

Common themes from respondents include the need to ensure proper consideration and due diligence of proposed projects being undertaken prior to selecting parties to participate in a Renewable Energy Zone. A few respondents suggested that the criteria should be considered in a sequential manner and elements of the selection criteria would need to be well advanced by interested parties before moving to the next criteria. For example, criteria such as land secured, financing, design, stakeholder engagement, consenting, network connection could be considered through a stage gate process.

There was a common theme from respondents on the stakeholder engagement criterion and the need for stakeholder strategies, including with iwi/Māori groups and the local community. Some respondents suggested that the criteria should be strengthened to ensure that these relationships allow for participation, collaboration and buy in. For example, projects that could demonstrate strong local support (e.g. from engagement) would likely be more successful. Similarly, establishing a framework for how the REZ co-ordinator or Transpower interacts with generation and load developers and other parties may be useful.

Several respondents noted that the weighting of criteria will be a key point of consideration. A generation developer noted that the weighting of various criteria will become a key point of consideration as there needs to be the ability to differentiate different generation project scores.

Several respondents noted the issue of alignment and timing for selected parties to commit to a Renewable Energy Zone. For example, whether there will be sufficient information on the likely cost of connection (and when costs start to be charged) before the tender process occurs. Similarly, an energy association noted the requirement for prospective generation developers to

contractually commit to partake and fund a portion of transmission connection and/or distribution network upgrade prior to build is the actual test as to the viability of a Renewable Energy Zone.

There were mixed views on the period of one year for the Expressions of Interest (EOI) phase proposed in the consultation paper. It was suggested by a few respondents that a period of one year for the EOI phase is much longer than necessary. For example, running a prolonged Renewable Energy Zone development process creates real risk of developer and stakeholder fatigue, especially for attraction of new capital and market participants to increase competition and lower costs. Conversely, there were concerns that the one year warming period was impractical given the need to adhere to other regulatory timeframes such as the Resource Management Act (RMA). Similarly, approvals by the Overseas Investment Office may preclude investments sought under this timeframe.

Some respondents asked how the project criteria would align and meet the technical and regulatory requirements. For example, Part 6 of the Electricity Code for 'Connection of distributed generation' for Electricity Distribution Businesses has specific roles for EDB's. Further feedback cautioned that it could be too premature to decide all criteria at this stage, and suggested work is prioritised on resolving the potential overlaps of a Renewable Energy Zone concept with current grid, network and Transmission Pricing Methodology (TPM) planning processes and approvals first. A few respondents argued that the cost benefit analysis needs to have a wider remit, and include a greater number of benefits than a simple regulatory investment test (e.g. CBA).

When asked for feedback on changes to or alternative processes, respondents provided a range of suggestions including criteria for:

- Smart, innovative and collaborative business models with other parties, such as other generators, end users and infrastructure owners.
- The use of other technology as part of the Renewable Energy Zone (for example, co-location of battery storage).
- Incorporating of industrial/commercial demand side load.
- Incorporating small scale generation projects.
- Local procurement and manufacturing of build components in New Zealand.
- Including participation from new market entrants.
- Including benefits to consumers (such as lower prices).
- Project developer experience.
- Ensuring revenue underwriting and offtake arrangements are in place.
- Consideration to culture impacts and alignment with Te Tiriti o Waitangi.
- Incorporating broader social, decarbonisation and economic benefits lens be applied in the project selection criteria.

Q10 Do you agree with the challenges we have identified?

Most of the respondents agreed with the challenges identified (n=26). The main challenges identified from respondents were aligned with the consultation document and included access and firm capacity rights, funding and cost recovery, co-ordination and timing of investment decisions, and environmental consenting and planning issues.

Respondents raised several points on each of these challenges and this is summarised under each of the headings below.

Access and firm capacity rights

Many respondents agreed that the current open access regime for transmission represents a risk for new generation projects. Some respondents felt that open access may not be appropriate for a Renewable Energy Zone concept, while others felt that the approach for Renewable Energy Zones and non-Renewable Energy Zones connections should be treated the same, or that a balance be struck between the existing open access rules and the rules to be put in place for Renewable Energy Zones.

Some respondents questioned whether firm capacity rights could be implemented under the regulatory framework in a reasonable timeframe, given the proposed principle of the consultation paper that Renewable Energy Zones are enabled with minimal changes to the existing electricity framework. For example, a regional council commented that given one of the guiding principles is to avoid major changes to the regulatory framework, it may not be a viable option to change the access regime.

A few respondents questioned how access or firm capacity rights would impact on competition, for example efficient dispatch of lowest cost generation and encouraging new entrant generation developers.

A few other points in the feedback questioned how Renewable Energy Zones would be managed over a distribution network, how private ownership of the transmission assets would be treated, and the length of tenure for the access/capacity rights. One point was how secondary movers pay the capacity costs for the connection.

Funding and cost recovery

A range of feedback was provided.

A common theme amongst respondents was the challenge of project risk and commercial risk, particularly alignment and timing of network investment and the corresponding renewable energy generation and/or load investment decisions and project delivery. Respondents noted both transmission and distribution challenges for network investment. For example, an energy association representing generation developers noted that the issue of timing of connection for different parties is specific to a multi-party situation such as a Renewable Energy Zone, and that there is a level of complexity and risk for multiple consent applications within a given area.

Similarly, a related challenge respondents raised concerned the need for timely and quality information on funding and cost implications for developers and consumers early in the process ahead network design and investment decisions.

A few respondents also connected this challenge with the timing and level of funding and cost recovery, particularly for large scale projects and the risk around recovery of network upgrade or build costs due to projects being delayed or not proceeding. One respondent argued that developers falling away through the process can cause a “waterfall of development failures”. They note that the construction schedules of developments are unlikely to align, and if one or more projects connected in a Renewable Energy Zone terminate their arrangement, then presumably the cost of the infrastructure must be recovered from the remaining development(s). If this is not the case then it may make these investments uneconomic and create a cascade of failed investment.

One respondent asked how the potential risk of a ‘free-rider’ issue would be addressed. This is where a party avoids the initial investigation work and costs and simply bids for a share of the connection capacity near the end of the Renewable Energy Zone establishment process. Other

respondents were interested to understand the implications of the Transmission Pricing Methodology on the Renewable Energy Zone funding and cost recovery model.

Respondents also provided feedback on the option to investment in transmission connection or distribution network's capacity ahead of need (also known as anticipatory investment). Some respondents argued the case for overbuilding the transmission and distribution network capacity ahead of need. For example, one respondent commented that the urgency of bringing new renewable generation to market now justified some risk of unnecessary cost associated with transmission overbuild – and that rapid decarbonisation is preferable to perfect efficiency of transmission investment.

Respondents also suggested a greater level of flexibility to allow for future projects to be added to the Renewable Energy Zone. For example, allowing for contingencies for new additions such as smaller generation projects, battery storage or future lower cost technologies.

Other points also highlighted legal and regulatory issues, such as competition law or Overseas Investment Office considerations, the issue of commercial and intellectual property tension between the provision of information regarding potential investments in generation by developers in the process. Another issue was who will bear costs on wider impacts on the energy system from high penetration of renewable energy capacity being added, such as the impacts on national security of supply.

Environmental approvals

There was general agreement by respondents that this is a challenge.

Many respondents raised issues in relation to matters that are addressed through existing environmental legislation, including the Resource Management Act 1991 (RMA), and the resource management reform that is underway.

Matters raised included the role of councils, iwi and communities, and the need to avoid and protect areas of biodiversity, historic and cultural significance, and concerns about visual impacts. The role of regionals spatial strategies (under the current or future legislation) in identifying suitable areas for Renewable Energy Zone development was also recognised by respondents.

A key issue raised was the relationship between environmental consenting and approvals and the Renewable Energy Zone concept. Some respondents raised concerns about the inter-relationship between Renewable Energy Zones and the environmental legislation, others raised issues about duplication or dual considerations.

Like the challenges of alignment and timing of investment decisions noted above, a common theme raised by respondents is the need to address co-ordination of consenting for multiple projects within the same Renewable Energy Zone. For example, this includes the planning rules and resource consents and is compounded where multiple developments may be seeking consents for the same region, at the same time. Respondents suggested that it necessary to reduce the development cost and risk as well as enabling rapid development of new renewable energy generation.

We heard that further investigation on interrelationships with the Resource Management Act (RMA) reforms and how these align with Renewable Energy Zones goals are needed.

Q11 What are some of the ways to overcome these challenges and who should be involved?

In Question 10, several challenges and issues were identified. Respondents provided a range of responses and points for this question in their submissions. This section attempts to summarise the feedback we heard from respondents on ways to overcome these challenges.

Access and firm capacity rights

Respondents suggested range of changes and additions that can help address the first mover disadvantage under the current open access regime, and some suggested these are used in combination.

Suggestions included:

- Providing access rights for a fee to projects that meet certain criteria and are available to projects for a fixed timeline, such as 20 years (i.e. use it or lose it).
- Setting up a common ownership model across generation sites and the transmission connection for access. For example, this could be in the form of a consortium of project developments.
- Engaging contractually as an access provider and access seeker of transmission capacity (e.g. such as a broker).
- A mechanism where new connected parties to the Renewable Energy Zone have to pay a proportionate share of costs in order to connect, rather than limited access rights to an 'initial club' of connected parties.
- Making changes to Financial Transmission Rights (FTR) system to allow for financial capacity rights.
- Charging generators a pro-rata allocation of asset upgrades through ‘leasing capacity’ arrangements to connected parties, where curtailments can be chosen in exchange for a lower cost for access to the grid. For example, generators could choose to accept the trade-off of ‘cost’ and ‘interruption’ or choose to store energy in co-located battery storage.
- Exploring a range of innovative contractual mechanisms for transmission capacity, such as sharing, allocation, non-firm, firm.
- Providing a greater level of information that may enable decisions for new investors in generation. For example, better facilitate investment by those who are new to the market about who else in the region they could partner with and how they might organise themselves for the cost of a connection, consenting process and access to land.
- Limit the amount and type of generation inside a Renewable Energy Zone based on technical and economic modelling.

Some examples were provided in submissions where the high connection cost and first mover disadvantages were challenges. For example, a gentailer referenced two examples in New Zealand that attempted to overcome the high connection cost and first mover disadvantage problem (note examples provided were two-party connected arrangements):

- A third party developer owning the Te Rere Hau site sharing transmission capacity with the gentailer’s Tararua Wind Farm; and
- The gentailer oversizing its transmission asset for its Turitea wind farm in anticipation of additional future generation from the region, including its own Puketoi project as well as other third party projects.

A generation developer and investor suggested the access regime and ownership models that are being explored in the Australia (Victoria and New South Wales) Renewable Energy Zones. Several access and ownership frameworks are being consulted on with industry and it was identified that this process could be followed once the possible frameworks under New Zealand regulations are mapped by Transpower.

Several respondents noted the need for flexibility to allow for new additions to the Renewable Energy Zone. These suggestions include:

- A staged approach to release capacity or reserved capacity in tranches to allow for multiple parties to be involved in the future Renewable Energy Zone.
- Offering 'second movers' to join the Renewable Energy Zone under conditions agreed with the existing partners or pay for the connection and cover the costs on their own. This would allow new parties to join the zone by modifying the agreement and can help avoid the zone being monopolised.
- Allow for the re-apportion of costs when new generators connect at the Renewable Energy Zone site in the future, which would provide first movers with a benefit through a reduction in costs or charges.
- Limiting the amount of capacity which can be given to any one developer, in order to enhance competition in the Renewable Energy Zone.
- Include the use of grid scale storage (e.g. batteries) as a potential solution to help mitigate open access issues and reduce connection costs.

Funding and cost recovery

A common suggestion from respondents for overcoming the challenges of funding and cost recovery was for the Government to underwrite the cost and risk of investing in transmission and distribution infrastructure ahead of need. This could either be partial or full underwriting of the risk by Transpower, central Government or agencies such as New Zealand Green Investment Finance (NZGIF) which would perform a similar role to the Clean Energy Finance Corporation (CEFC) in Australia or private banking, financial and asset management institutions. This approach would have the intent to reduce the uncertainties for the generation or load developers such as the long timeframes for consenting and installing transmission infrastructure. This anticipatory expenditure could then be recovered from subsequent connecting generator or users. This would require Government to carry some risk by taking an anticipatory investment approach. Respondents noted the additional benefits of this approach to ensure that the grid is future proofed before we see a rapid influx of electricity generation and electrification load and that New Zealand can meet its decarbonisation goals.

One proposed solution to address the issue of alignment and timing of transmission investment and the corresponding generation or load development could be achieved through privately owned assets. Some respondents noted a preference for customer-owned connection assets, as they can be designed and built in a manner aligned to the renewable energy development timeframe and managed as one project. A potential opportunity is where the Government carries the cost and risk in the interim between the infrastructure being built and being in use, with cost recovery from the eventual beneficiary or beneficiaries over the life of an asset.

Another challenge identified was a situation that a project developer pulls out after the transmission or distribution investment has started. This may have further issues of projects being delayed or not proceeding, and the need to cover the resulting risk and costs (e.g. loss of revenue, staff impacts etc). A solution suggested by respondents would be to allow parties who are unable to fulfil their commitment an option to sell their participation in the project. Other suggestions

included pre-payment mechanisms such as an upfront cost or other forms of security which would only be refundable if all parties terminate, or a replacement can be assigned. Similarly, introducing a concept of 'REZ bridging finance' which will enable the project to proceed and mitigate project delays until a replacement party is confirmed. One respondent commented that even while the consultation proposed back-ups, these are not guaranteed and the risk of such a burden will be a material consideration for investors.

Many respondents noted the need to act quickly to ensure we move towards a decarbonised and more renewable energy sector. One respondent suggested taking a less economically strict approach to grid investment and suggesting integrating potential carbon benefits of 'oversizing' network investment (or conversely the potential carbon costs of 'under-sizing' or 'late-sizing'). This could be achieved through alignment with the Climate Change Commission emission reduction pathways.

Respondents also suggested that traditional poles and wires solutions; and non-network alternatives (from network companies and other suppliers) should be explored when identifying potential technical network solutions that could service the REZ.

Environmental approvals

Several respondents suggested that consideration is given to relevant regulation and planning processes. For example, the need for consideration given to any regulatory impacts to promote investment certainty. Some respondents suggested the need to further stocktake and map the relevant regulatory issues given one of the principles of the concept is to make minimal changes to the existing electricity regulatory framework.

Many respondents strongly urged the need to work closely with the market and regulatory bodies in the designing of the Renewable Energy Zone concept. Some stakeholders suggested whether the concept of Renewable Energy Zone can be more effectively enabled and recognised through its own dedicated regulations and/or integration with new and existing reforms underway, such as the Natural and Built Environments Act (NBA) (to be the main replacement for the Resource Management Act), the Strategic Planning Act and the Climate Adaptation Act. For example, the role of the Resource Management Act reform with it either being seen as a barrier to development, or alternatively, as driving development with suitability of an area determined through Regional Spatial Strategies (RSS).

It was suggested that Renewable Energy Zones should not result in dual regimes or duplication of considerations.

A range of suggestions were provided by respondents to address the challenge of Environmental approvals for Renewable Energy Zones. These include:

Policy direction

- Dedicated Renewable Energy Zones consenting resources could be explored. For example, special planning zones, along with fast-tracking processes and aggregation of consents.
- The need for further research and investigation on regulatory issues, such as interactions between existing legislation in the context of access to resources and land to develop Renewable Energy Zones (e.g. Local Government Act, Land and Soil Conservation Act and the Marine and Coastal Area Act).
- Involving Iwi in initial design including go and no-go decisions.

- Renewable Energy Zones design to include a focus on high value and enduring environmental benefits for the region, such as new biodiversity corridors, restoring habitat and creating wildlife/fauna sanctuaries.

New overarching legislative frameworks

- Adopt a simplified and co-ordinated step approach that would favour renewable energy. For example, a 'one stop shop' rather than several agencies.
- Establish a Regional Reference Group (similar concept from NSW) with broad cross-section participation including local suppliers, Iwi groups, regional and local councils, businesses, and government agencies.
- Mandatory requirement for co-ordination amongst developers in respect of community and stakeholder engagement.

Tools for engagement

- Emphasising the shared benefits to the local community upfront rather than as a response to community and stakeholder concerns.
- Establishing monitoring and assessment of metrics and key performance indicators (for example, the Infrastructure Sustainability Council suggested the measurement of sustainability performance of infrastructure assets using a common rating tool like IS Rating Scheme from the ISCA in Australia). This would better allow for benchmarking between asset types and quantification and aggregation of data on a range of outcomes.
- Better use of open access software/digital platforms/virtual reality to provide better information for stakeholders. For example, the impact of proposed projects including cumulative impact on communities and the environment, or identification of natural hazard risks for risk and resilience of the energy system

Other suggestions to address challenges

A common theme from submitters was that overcoming these challenges will be aided with early and extensive engagement with key stakeholders such as developers, regulators, central government, local government, businesses, community, iwi/hapū, the general public and others. This would likely include the Renewable Energy Zone co-ordinator(s), but equally the generation or load developers. For example, establishing clear guidelines for engagement with parties that are not necessarily asset owners.

Other ways noted to overcome the various challenges provided by respondents include:

- Undergrounding transmission lines.
- Create a working group with key stakeholders to explore and identify solutions.
- Establishing clear guidelines for engagement with non-asset owners (e.g. community, iwi, etc.).
- Government subsidies or carbon credits for renewable energy projects.
- Establishing monitoring and assessment of metrics and key performance indicators (for example, the Infrastructure Sustainability Council suggested the measurement of sustainability performance of infrastructure assets using a common rating tool like IS Rating Scheme from the ISCA in Australia). This would better allow for benchmarking between asset types and quantification and aggregation of data on a range of outcomes.

Q12 Do you see any other potential challenges that need to be considered?

Respondents provided other challenges not already identified in the consultation document or responses to questions 10 and 11. These include:

Energy system and technical challenges

- The wider energy system challenges of variable renewable energy, particularly on security of supply and costs to consumers.
- Technical challenges of installing large amounts of renewable energy invertor-based resources can raise risks for the energy system if not properly managed. For example, consideration of the technical requirements and connection assessment requirements such as fault level, controller interaction and harmonic emissions.
- Unique characteristics of generation projects in a Renewable Energy Zone location can impact on the viability of the Renewable Energy Zone. For example, wind generation impacting on other forms of generation.

Commercial challenges

- How to properly account for investment decisions including the benefits and costs across the whole system in an integrated way, such as impact on system balancing, grid transportation or network capacity.
- Consideration given to New Zealand based economic benefits, compared with offshore or international economic benefits
- Ensuring that the transmission capacity investments downstream of the immediate Renewable Energy Zone are appropriately sized to allow for the renewable energy to reach high interest developments regions (e.g. EDB load).
- In addition to addressing the funding and cost recovery challenge, there is still a need to focus on financing (financial risk) and gap for the capital cost of investment in the renewable energy generation. For example, the offtake and revenue streams (e.g. PPA).

Renewable Energy Zone process challenges

- Where a generator connects within a distribution network, ensure the network distribution connection priority is aligned with the transmission connection priority.
- Progressing Renewable Energy Zones does little to assist in the current connection request backlog experienced by Transpower.
- During the pilot in Northland, developers or large energy users will continue to face first-mover disadvantages for new connections outside of the Renewable Energy Zone.
- Ensuring that the Renewable Energy Zone processes are not unduly captured. For example, through political interference or conflicts of interest of the Renewable Energy Zone co-ordinator.
- How the 'renewability' of a load customer will be assessed. For example, a fertiliser factory connecting to the Renewable Energy Zone.

Resourcing challenges

- Consideration given to the limited resources of local Electricity Distributions Businesses to serve needs of large generation and/or load investment.

- Renewable Energy Zones should not result in dual approvals regimes. Additional challenges include landowner access, resource consents, consistency in application of the adaptive management approach by Department of Conservation.

Competition challenges

- Exploring the potential for a pilot in Northland may however have an unintended consequence by creating uncertainty and discouraging investment decisions. For example, while recognised as a transitionary risk for Renewable Energy Zones, it may have the negative impact on developers close to making final investment decisions relating to projects elsewhere, where it may be more economic to wait for a Renewable Energy Zone model to occur.
- The risk that a party bids for a major proportion of the planned connection capacity to 'capture' the opportunity to develop a local renewable energy resource to the disadvantage of other parties.
- Potential risk that people buy land around prospective or established Renewable Energy Zones to 'land bank'. Access to land might be a barrier for people wanting to develop the Renewable Energy Zone.

General points

- Ensuring that unintended consequences of solving for challenges do not create new challenges. For example, impacts on the energy system from high penetration of renewable energy capacity being added, such as the impact on national security of supply.
- Whether Renewable Energy Zones encourages or discourages transmission developments by electricity distribution businesses to connect new renewable generation projects, or whether electricity distribution businesses may develop Renewable Energy Zone equivalents within their own networks.
- For energy resilience the risks from natural hazards, some related to our geological environment and changing climate. These hazards should be considered as risks to the Renewable Energy Zones.
- The need for further analysis of risks before progressing Renewable Energy Zones, as there is the potential that unexpected or resolved risks may in fact delay connections for new generation and load in areas, compared to the existing process.
- Lack of analysis on the issues and problem definition or market failure that Renewable Energy Zones is seeking to address in the consultation document, including more consideration, analysis and ranking of alternative options.

4

Summary and analysis of Northland Pilot Concept Consultation

This section includes what we have heard from submitters' responses against the seven specific questions asked in the consultation document, plus any general comments of relevance to specific questions.

This document is not an exhaustive summary of stakeholder feedback, or of Transpower's views or position on the feedback received during the consultation process.

Q1	Do you support the development of a REZ in Northland? Please provide your reasons as to why or why not.

Most (n=59) support the development of a Renewable Energy Zone in Northland, with approximately four out of five responses providing partial or full support. Those that provided full support were broadly influenced from respondents who had interests in the Far North and Northland regions.

Where respondents provided reasons for support, these were broadly across themes of social, economic, culture and environment improvement. Support was generally consistent with the benefits identified in Question 2 below. The themes that received the most support included unlocking renewable electricity generation and energy projects (n=33), local economic development (n=21), potential for lower costs to consumers (n=19), increased resilience and security of the energy system (n=19) and climate change and environmental reasons (n=16). For example, respondents saw Northland as having strong renewable energy resources from solar and wind which would unlock renewable electricity generation, and the potential for local regional economic benefits, from attracting investment, new industry, employment opportunities and skills development and potential for lower electricity costs to consumers. A few respondents noted the regulatory environment in Northland being supportive of renewable electricity generation and renewable energy projects.

Despite broad agreement, six responses did not support the development of a Renewable Energy Zone in Northland. Respondents expressed concern about the aesthetic impact on the land and surrounding environment, belief that costs to consumers will increase, adverse health impacts associated with renewable energy generation and potential impacts on local distributed electricity generation projects being progressed by community or iwi. A few respondents also questioned the merits of the Renewable Energy Zones concept. For example, an individual noted that the real problem appeared to be driven by the volume of interconnection requests.

Q2	What potential benefits of a REZ are important to you? Consider economic, social, cultural and environmental factors.

Respondents suggested more than twenty types of benefits that are important. The benefits that received the most support in order of importance include, climate change and environment (n=33), economic development for the local economy from attracting new investment (n=37), social and community outcomes (n=27) such as lower electricity costs to consumers including reducing energy hardship (n=34) and local employment opportunities including new job creation and skills and training (n=29), security of supply and resilience of the region and energy system including self-sufficiency (n=19), unlocking renewable energy projects (n=16) and importance of cultural outcomes for Te Tai Tokerau and tangata whenua (n=16).

Broadly, respondents were supportive of a wider scope of regional social and economic benefits and outcomes to be considered beyond the energy system.

We also heard opportunities for development of industry and demand, transitioning existing industry and the highly skilled workers into clean energy opportunities and creation centre of excellence for renewable energy skills, training and capability. For example, iwi, hapū and the wider local community should be encouraged and supported to contribute to the Renewable Energy Zone success, through land use, investment or skills training.

While Renewable Energy Zones have the potential to be a key driver of the social, economic and self-sufficiency aspirations for Northland, some respondents noted that it was important that costs did not fall on local consumers. For instance, issues concerning community deprivation, energy poverty and socioeconomic challenges. For example, the Northland population includes a higher proportion of rural and Māori compared to other locations in New Zealand, and an iwi submission noted that Māori are overly represented in the statistics for items such as energy and fuel poverty, compared to the national average. There was strong evidence from respondents that the developers of Renewable Energy Zones need to factor these groups into their broader thinking and ensuring that the local community, including hapū and iwi, are well engaged through the Renewable Energy Zone process.

Q3	What potential costs of a REZ are important to you? Consider economic, social, cultural and environmental factors.

Respondents suggested more than twenty types of costs that are important. The costs that received the most support in order of importance, include the potential impact of higher costs for consumers (n=26), including from line charges and cost of the network investment (n=12) and energy equity costs on those who can least afford it (n=4), the impact on the natural environment (n=5) including visual/landscape impacts, land use and impact on biodiversity and wildlife, broader societal and community impacts (n=6) including economic impacts on the region and impacts on local culture, tangata whenua, iwi and hapū.

Many respondents strongly argued that the community and electricity consumers should not be burdened with higher costs as a result of a Renewable Energy Zone. For example, many respondents did not wish to see higher electricity bills and pointed to the current electricity prices paid by Northland residential, commercial and industrial consumers compared to other parts of

New Zealand. A key point was the particular impact on those in the local community who are in energy hardship and can least afford it.

Further, some respondents noted the importance of fairness and equity, such as the need to ensure that local stakeholders/developers, including iwi and hapū entities, are not shut out of participation by unfair (or high) connection costs, capacity constraints, or being outbid by 'big players' or speculators 'land banking'.

Many respondents highlighted that Far North/Northland has many areas of environmental and cultural significance for hapū and iwi. While respondents noted there are existing regulations and processes in place, potential impacts on the local land, taonga, biodiversity, wildlife, and the visual impact of renewable energy generation would still be required to be carefully considered through existing consenting regimes.

We heard that working in partnership with hapū and iwi to embrace Te Ao Māori in any pilot, and beyond, will be critical to realising aspirations of positive, broader social, natural, financial and human outcomes through built environment investment decisions.

A few respondents also felt that consideration needed to be given to the situation where a Renewable Energy Zone failed where parties pull out or are delayed, how this would be managed and who would be responsible for any residual risk and costs. Other examples highlighted included the administration costs, opportunity costs for projects outside of the Renewable Energy Zone that could be de-prioritised, or unintended impacts such as impacts on security of supply from variable renewable energy (in the absence of peaking generation, balancing assets or controllable load), volatility in energy prices from intermittent energy supply such as wind and solar and the potential for the concept to undermine existing competitive market processes.

Q4	Do you support enabling developments through upgrades to existing lines and substations as demand for connections to the networks emerge? If not, what alternatives would you propose?

In principle, most respondents support enabling developments through upgrades to existing lines and substations as demand for connections to the networks emerge (n=51).

Several respondents agreed that while new investment in transmission and network assets may need to occur as demand for connections emerge, where possible, minimising the need for investment is sensible. For example, upgrading existing infrastructure would be less disruptive, have a lower environmental footprint, and be more efficient and cost effective than investing in new greenfield infrastructure.

A few respondents also noted the potential benefit of upgrades to existing infrastructure taking less time and resource to complete, enabling a shorter lead time to development of generation or load for the Renewable Energy Zone. Some respondents questioned how investment could be minimised if the renewable energy resources (largely on the west side of the region) were located away from existing transmission assets.

There was mixed feedback from respondents on whether investment in transmission infrastructure should follow anticipatory investment, which is building transmission infrastructure ahead of need, or rather, 'just in time' investment to meet demand as it occurs. Several respondents

acknowledged that there are existing regulatory processes and provisions in place for investment in transmission and distribution network infrastructure.

The common theme from respondents was to ensure that investment in lines and substations would be compared with or supplemented by alternative options to avoid or defer network upgrades where possible. For example, demand flexibility initiatives and non-network alternatives such as storage technology from grid scale batteries and distributed energy resources such as solar.

A list of alternatives grouped by type that were proposed by respondents include:

- Non-network solutions.
- Flexibility services such as demand management.
- Consumer behaviour changes such as energy efficiency.
- Enabling greater levels of small-scale electricity generation, such as distributed energy resources.
- Virtual power plants.
- Undergrounding transmission/distribution lines.
- Storage, such as batteries.

One respondent raised a potential conflict for Transpower, Northpower and Top Energy for incremental investment in the network. This perceived conflict is between the parties having an interest in Renewable Energy Zones concept and the need for the same parties to consider network alternatives or non-network solutions. Another concern highlighted was that the Northland Pilot may delay or crowd out small scale commercial distributed generation projects.

Q5	If new lines needed to be built to connect resources, where should they be constructed/not constructed?

The main themes from respondents were for undergrounding electricity lines, avoiding areas of environmental, historic and cultural significance and building new electricity transmission infrastructure along or near existing infrastructure, such as road corridors.

Several respondents from the general public suggested that while undergrounding lines would be more expensive, they would reduce the visual impact.

Respondents strongly felt that Renewable Energy Zones should avoid or minimise impact on areas that are environmentally sensitive and places of historic and cultural importance. Similarly, a few respondents noted the issue of increasing severe weather-related events from climate change and existing natural hazards, and the siting of grid infrastructure away from coastal regions or other high-risk areas.

Some respondents suggested that engagement with hapū, iwi, land owners and communities would be critical to understand these cultural and environmental areas of importance. One developer expressed concern that if consultation and engagement with the local community was inadequate, the Renewable Energy Zone co-ordinator would face significantly higher deliver risk on proposed new transmission infrastructure. This may result in the possibility of not being able to facilitate a proposed Renewable Energy Zone due to community opposition.

A list of specific locations put forward by respondents include:

- Ruakākā or Portland, particularly in industrial areas.
- Kaikohe to Dargaville transmission line to provide redundancy for the Kaikohe to Maungatapere line.
- Dargaville and Marsden where renewable energy is located.
- Muriwhenua and Pārengarenga where there is potential for wind and solar.
- The upgrade for the REZ generation north of Bream Bay would need to run from the far North all the way south to the main GXP that ties to the Auckland load.

For various reasons several respondents were not able to respond, with the most common reason being the technical nature of the question.

Q6 Are there alternative proposals that you think we should consider?

A number of proposals were suggested by respondents as alternatives or additions to the Renewable Energy Zones concept.

The most common message from respondents was for the use of distributed energy resources (e.g. rooftop solar, energy storage) or stand-alone community networks such as small-scale electricity generation. One example provided was a collaboration to develop local community (whānau /ahu whenua /hapū) owned solar farms and battery storage that will offer solutions that do not need upgrades to existing lines and networks. We heard from several respondents who recommended framing this opportunity as a regional resilience response alongside the national renewable energy objectives.

Many respondents suggested the use of electrification of load and other emerging technologies to ensure that the Renewable Energy Zone has a low environmental footprint, is economically efficient and can deliver the lowest overall system cost. For example, this could include industrial demand creation, regional energy hubs, flexibility services, such as demand management for load balancing to avoid, minimise or defer the amount of investment needed in transmission and local network infrastructure.

A number of respondents also suggested alternative forms of renewable electricity generation such as small-scale hydro, geothermal and tidal generation. Bioenergy resources were raised as a potential green fuel for Te Tai Tokerau.

Other suggestions included co-location with other infrastructure such as gas or hydrogen pipelines in the Whangarei area, undersea direct current cables to transmit power from Dargaville via the Kaipara Harbour to Auckland and off-grid magnets.

A number of alternative proposals were also received under the National Consultation document regarding how costs might be recovered for the network investment. These alternative proposals provided by respondents under Question 11 of the National Consultation were also relevant to this question.

Q7	Do you have development projects that a REZ might assist you to construct and connect?

A range of development projects that a Renewable Energy Zone could support were provided by respondents.

A list of projects noted by respondents include:

- A small-scale hydro generation plant with a 300KW turbine.
- Potential for housing developments such as Papakainga and wider housing developments, including retirement villages.
- Electric vehicle charging network in Northland.
- A virtual power plant for the Waimamaku Valley.
- Approximately six undisclosed generation projects, between 50MW and 70MW each.
- Pārengarenga Wind Farm is a proposed development near Te Kao with a potential capacity of 300MW.
- 100MW utility scale solar generation site.
- Replacing existing diesel generators used for outage support.

Many respondents noted that there are a range of investment opportunities and development projects that are in various stages of planning or commissioning. Some respondents felt that a Renewable Energy Zone would assist to unlock or bring forward many of these projects. However, one respondent felt that a Renewable Energy Zone would not assist in constructing and connecting their projects.

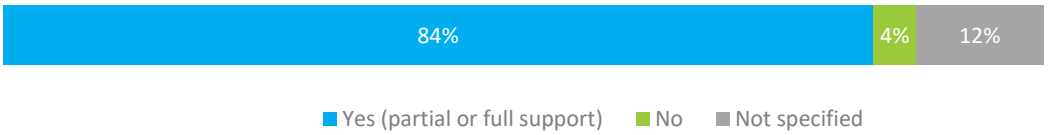
5
Appendix

5.1 Quantitative analysis

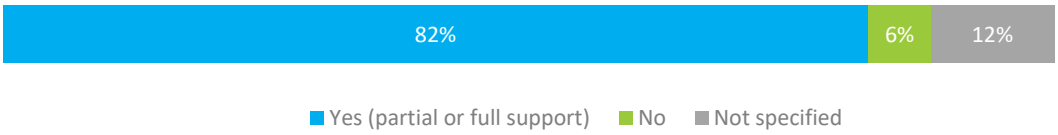
This section presents the results of where we have sought to quantify some questions. This is provided for background context rather than quantifying support for certain views.

National Consultation

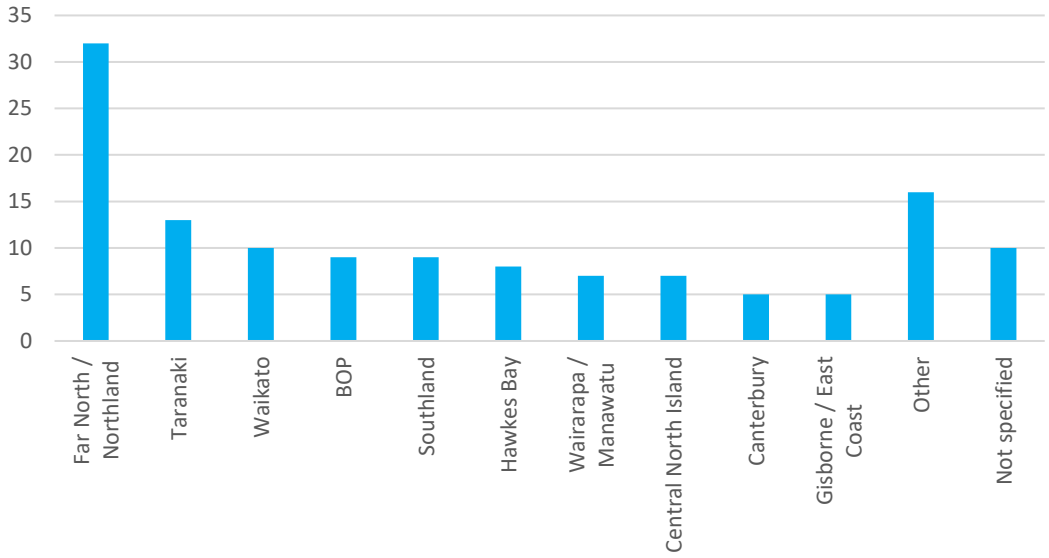
Q1. Do you agree that the first mover disadvantage and high connection costs can be challenges for connecting new renewable generation and/or large electricity loads to the electricity network? (n=49)



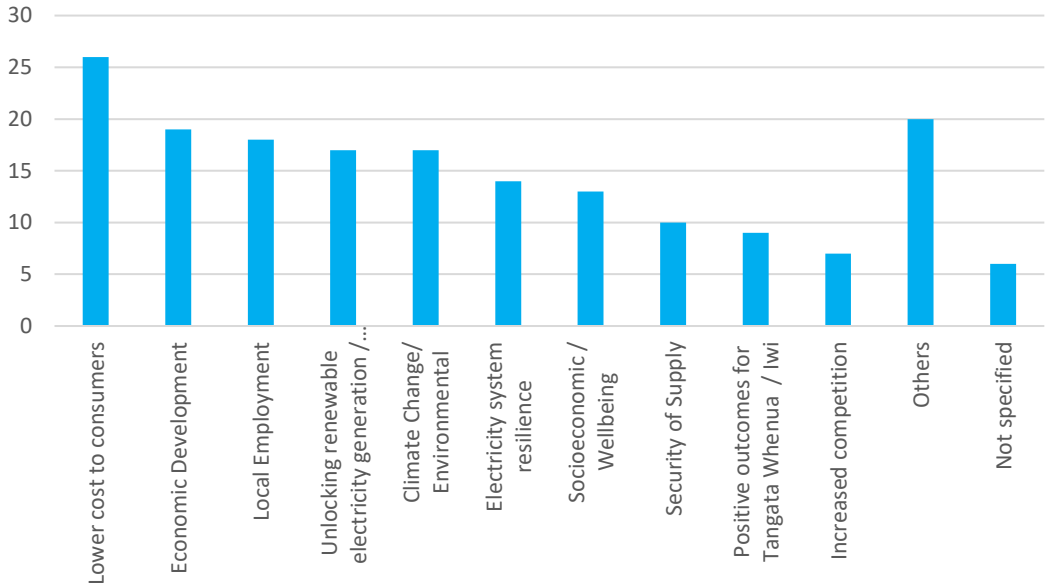
Q2. Do you think the concept of a Renewable Energy Zone could be beneficial in a New Zealand context? (n=51)



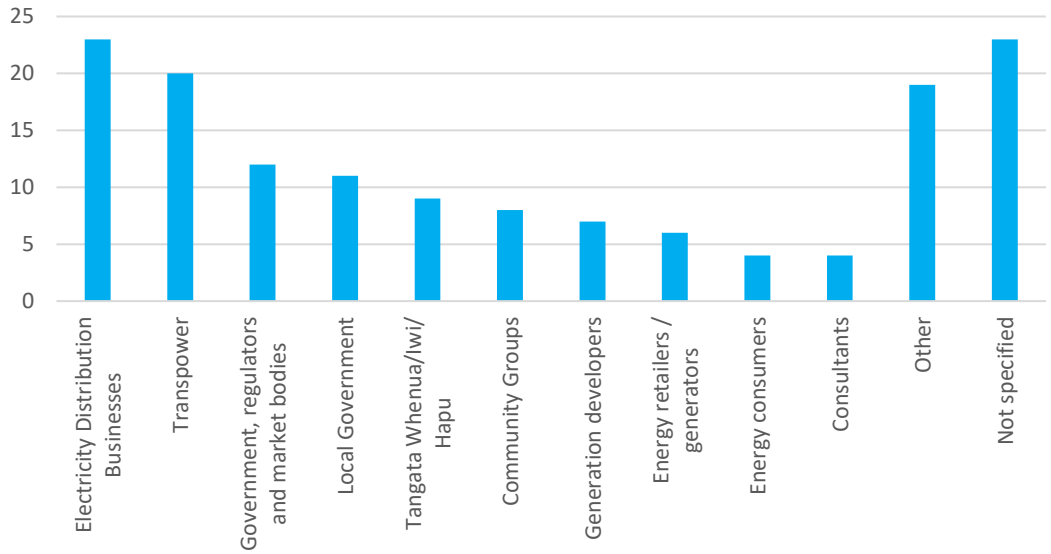
Q3. What region(s) do you think would be suited to Renewable Energy Zones? (n=131). Note there were 47 respondents to the question. Multiple regions could be selected and the total sample size of responses was 131.



Q4. What benefits do you think should be considered in the decision-making process for Renewable Energy Zones in New Zealand (n=176)?

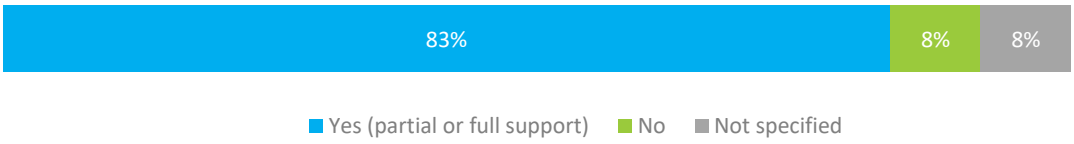


Q8. Who should be involved with co-ordinating and undertaking the various steps within a REZ development process? (n=146)

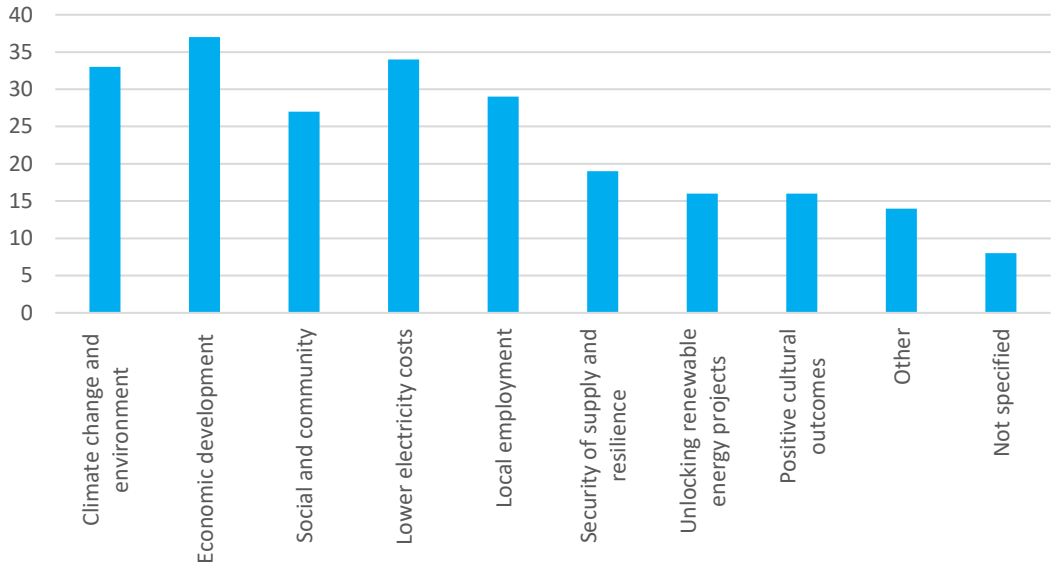


Northland Consultation

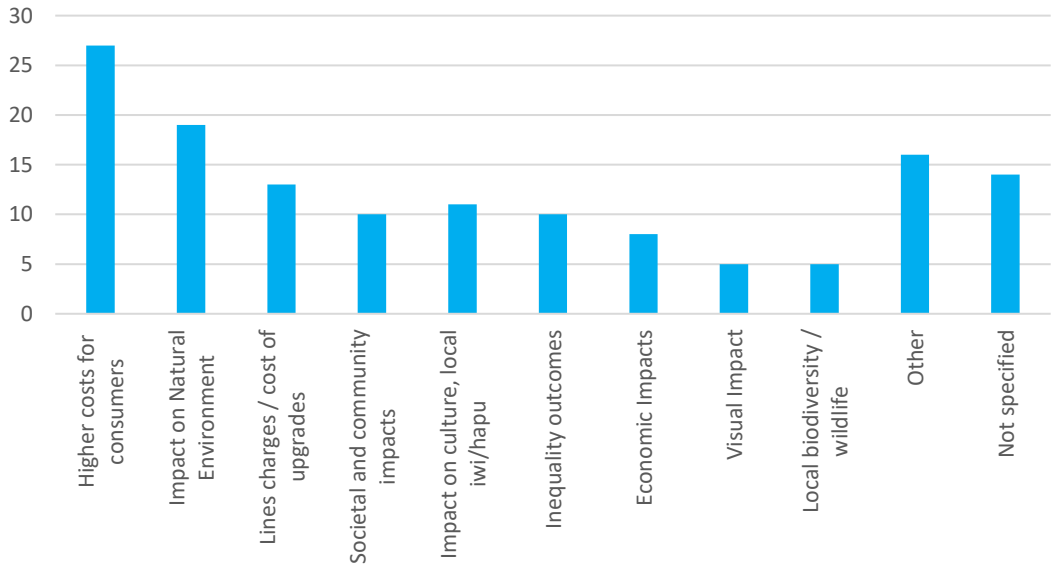
Q1. Do you support the development of a REZ in Northland? Please provide your reasons as to why or why not (n=71).



Q2. What potential benefits of a REZ are important to you? Consider economic, social, cultural and environmental factors (n=233).



Q3. What potential costs of a REZ are important to you? Consider economic, social, cultural and environmental factors (n=138).



5.2 List of respondents

- Akuo Energy New Zealand
- Anglesea Agriculture Ltd
- APD Engineering
- Aurecon
- Aurecon (for Parengarenga Inc. and Yinson Renewables)
- Bev Ennis
- BlueFloat and Energy Estate
- Bob Bingham
- Brigit Anne Manning
- Carbon Neutral NZ Trust
- Carbon Neutral NZ Trust, Kerikeri Branch
- Carol Peters
- Channel Infrastructure (previously NZ Refining)
- Clare Swinney
- Climate Change Tai Tokerau Northland Trust
- Colin Ward
- Contact Energy
- Copenhagen Infrastructure Partners and NZ Super Fund
- Corralie Betts
- Donald Chandler
- Dr Emily Henderson
- Eco Solutions Whangarei
- Electric Kiwi and Haast Energy
- Electricity Networks Association
- Emma McLean
- Energy Efficiency and Conservation Authority
- Energy Estate and Elemental Group
- First Gas
- First Union New Zealand
- Forest & Bird Northland
- Fortescue Future Industries
- Front-end Solar Technologies Ltd (for Hokianga Housing Resource Collective)
- Genesis Energy
- Geoff Sharples
- Hiringa Energy
- Hokianga Housing Response Collective
- Horizon Energy Distribution Limited
- Ian Forrester
- Independent Electricity Generators Association
- Infrastructure Sustainability Council
- Infratec
- Institute of Geological and Nuclear Sciences
- Jamie Penney
- John O'Neill
- John Subritzky

- Kaikohe Business Association
- Katy Davidson
- Kiwi Solar Farms
- Liz Woodward
- Lodestone Energy Limited
- Major Electricity Users Group
- Marilyn Ruth Cox
- Martin Ough Dealy
- McKay Limited
- Mercury
- Meridian Energy
- Michael Buhr
- Mick Kelly and Sarah Granich
- Nathan James Beuker
- Ngati Korokoro Hapu Trust
- Northland Business Group
- Northland Councils (for Far North DC, Kaipara DC, Whangarei DC, Northland RC)
- Northland Inc - Regional Economic Development Agency
- Northpower and Top Energy
- Northern Energy Group (for Counties Energy, Northpower, The Lines Company, Top Energy, Waipa Networks, Vector)
- Nova Energy
- NZ Geothermal Association
- NZ Wind Energy Association
- Oliver Krollmann
- Orion New Zealand
- Our Energy Limited
- Patuharakeke Te Iwi Trust Board and Ngāti Hine Forestry Trust
- Paul M Smith
- Peter Coates
- Peter Hewitt
- Quail Ridge Country Club Limited
- Rānui Generation
- Richard Elger
- Rik Schijf
- Ruakaka Residents and Ratepayers Group
- Ruth Marsh
- Simon Trevor Bennett
- Sustainable Energy Association of New Zealand
- Te Kahu o Taonui o Taitokerau
- Te Runanga O Te Rarawa
- Te Tai Tokerau Water Trust
- Tesla Consulting
- Thomas Zink
- Tim Crawford
- Trustpower
- Vector Powersmart
- Venessa Anich

- Venture Taranaki
- Vision for Kerikeri and Environs
- Waikato Regional Council
- Waipapa Trust
- Wendy Kathleen Ferguson
- YEH Renewable Energy Consultants Ltd
- Zela Charlton

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