Submission on *Measures for Transition to an Expanded and Highly Renewable Electricity System*

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Release of information

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N/A

[To check the boxes above: Double click on box, then select 'checked']

Responses to questions

Part 1: Growing Renewable Generation	
1.	Are any extra measures needed to support new renewable generation during the transition? Please keep in mind existing investment incentives through the energy-only market and the ETS, and also available risk management products. Any new measures should add to (and not undermine or distort) investment that could occur without the measures.
	Yes – see further answers elaborating on this in the questions below.
2.	If you think extra measures are needed to support renewable generation, which ones should the government prioritise developing and where and when should they be used? What are the issues and risks that should be considered in relation to such measures?
	Contracts for Difference (CfD) similar to the Victorian Renewable Energy Target's (VRET) CfDs could be utilised nationwide with a 15- to 20-year horizon. If this measure was introduced as soon as possible, there would be risk of overbuilding generation capacity; however, the benefits associated with higher security, lower average prices and lower emissions outweigh these costs.
3.	If you don't think further measures are needed now to support new renewable generation, are there any situations which might change your mind? When and why might this be?
	N/A
4.	Do you think measures could be needed to support new firming/dispatchable capacity (resources reliably available when called on to generate)? If yes, which kind of measures? What needs do you think those measures could meet and why?
	Measures on two fronts could support this: • First, as with the UK model, secure capacity and provide incentives to thermal plants to continue operating during the transition, 15 – 20 years. • Secondly, similar to VRET CfD, which provides incentives for expansion in battery capacity, a measure to increase storage. Larger-scale batteries for use as firming capacity or providing dispatchable capacity require large capital investments. In neighbouring jurisdictions such as Australia, whole-of-government electricity procurement has been utilised to create additional battery storage capacity (e.g. NSW Government electricity contract in 2021 including the construction of a 100 MW regional battery).
5.	Are any measures needed to support storage (such as battery energy storage systems or BESS) during the transition? If yes, what types of measures do you think should be considered and why?
	Measures to support BESS are in the responses to Q4
6.	If you answered yes to question 4 or 5 above, should the support be limited to renewable generation and renewable storage technologies only or made available across a range of other technologies? Keep in mind that fossil fuels are generally the cheapest option for firming, though this may change over time as renewable options (particularly batteries) become more efficient and affordable.

	Should not be limited to renewable storage technologies
7.	If you answered yes to question 6 above, what are the issues and risks with this approach? How could these risks and issues be addressed? N/A
8.	Are any measure(s) needed to support existing or new fossil gas fired peaking generation, so as to help keep consumer prices affordable and support new renewable investment? See answer to question 4 – the UK model.
9.	If you answered yes to question 8 above, what measures should be considered and why? What are the possible risks and issues with these measures? The UK model, for security and affordability during the transition.
10.	If you answered yes to question 8 above, what rules would be needed so that fossil gas generation remains in the electricity market only as long as needed for the transition, as part of phase down of fossil gas? Establish a 15 to 20-year horizon, with the possibility of renewal depending on the supply/demand conditions around 2035.
11.	Are there any issues or potential issues relating to gas supply availability during electricity system transition that you would like to comment on? Gas supply should be available during the transition for security and affordability reasons.
12.	Do you agree that specific measures could be needed to support the managed phasedown of existing fossil fuel plants, for security of supply during the transition? Yes.
13.	If you answered yes to question 12 above, what measures do you think could be appropriate and why? What conditions do think you should be placed on plant operation? For example, do you have any views on whether there should be a minimum notice period for reductions in plant capacity, and/or for placing older fossil fuel plant in a strategic reserve? Yes, the measures should balance the pros and cons of maintaining incentives for operation, with a clear path related to reductions in plant capacity. It may be necessary to place fossil fuel plants in a strategic reserve, considering dry-year and extreme weather events. In addition, a minimum notice period of three years for plant closure is reasonable, since it may prevent/relieve security/affordability issues during a dry year.
14.	If you answered yes to question 12 above, what are the issues and risks with these measures and how do you think these could be addressed? The risk is to provide incentives for the plants to be in operation longer than necessary/desirable and for not reducing emissions at desirable rates. However, the second issue can be mitigated by requiring the installation of carbon capture technology.
15.	What types of commercial arrangements for demand response are you aware of that are working well to support industrial demand response? Capacity-Based Contracts, Price-Based Contracts and Collaborative Agreements are some of the commercial arrangements that have been practised between industrial and energy sector in recent years.

16. What new measures could be developed to encourage large industrial users, distributors and/or retailers to support large-scale flexibility?

The Virtual Energy System (VES) project carried out by the National Grid ESO in UK is a good exemplar in promoting large-scale flexibility from which New Zealand could learn. The VES project aims to create an ecosystem of connected digital twins of the entire energy system of Great Britain, which operates in synchronisation to the physical system (VES, 2023). Both industrial users and electricity system operators would be deeply involved in the project, in addition to government, retailers, aggregators and researchers.

By utilising the digital twin technology, the complete system would be able to provide a secure and resilient sharing of energy data across different organisations and sectors, helping to facilitate a more complex scenario modelling to deliver optimal whole-of-system decision making. As a crucial part of the whole energy system decision-making, large industrial energy consumers will benefit from the establishment of a virtual energy system and utilisation of digital twin technology by achieving a more flexible and optimal demand response and demand management.

17. Do you have any views on additional mechanisms that could be developed to provide more information and certainty to industry participants?

Other data-sharing frameworks among industrial units with technology other than digital twins could also be considered, such as the blockchain-based systems in recording transaction data.

Part 2: Competitive Markets

18. Do you agree that the key competition issue in the electricity market is the prospect of increased market concentration in flexible generation, as the role of fossil fuel generation reduces over time?

The prospect of increased market concentration in flexible generation is a significant competition issue in the electricity market as fossil fuel generation decreases. This concentration could result from the evolving generation mix, which may weaken competition, especially for longer-term flexibility services.

The reduction in fossil fuel generation, combined with the limitations of battery technology for extended cycling, could lead to a situation where flexible hydro generation becomes a dominant source of longer-term flexibility. This concentration of market power in a specific sector of the market can potentially harm competition, raise prices, and limit options for consumers and other market participants.

The NZ Battery project, if implemented, may lower this risk considerably. One should account for this when estimating the benefits of the NZ Battery project.

19. Aside from increased market concentration of flexible generation, what other competition issues should be considered and why?

There are several other competition issues to consider in the electricity market, including:

- **Aggregation of Consumer Load:** As mentioned in the provided information, the aggregation of consumer load, especially in areas such as vehicle-to-grid flexibility, can be a competition concern. Market participants who control a significant portion of consumer load aggregation can influence market dynamics.
- **Structural Barriers:** Barriers to entry for new market participants in the market can impact competition. For instance, if new entrants face substantial barriers to building

renewable generation capacity, it could lead to concentration among existing players. Vertical integration is a potential source of market power and it may prevent entry in the industry, particularly, in retail.

- **Market Manipulation:** The ability of large generators with significant flexibility to exercise market power and manipulate spot prices, potentially leading to higher prices and reduced competition. Ensuring that market participants do not engage in anti-competitive conduct, such as price manipulation or collusion, is crucial for maintaining fair competition.

20. What extra measures should or could be used to know whether the wholesale electricity market reflects workable competition, and if necessary, to identify solutions?

To assess and ensure workable competition in the wholesale electricity market, the following measures can be considered:

- **Regular Market Monitoring:** Continuously monitor market behaviour, pricing trends, and concentration levels to identify any signs of anti-competitive behaviour or market power abuse.
- **Market Design:** Consider market design changes that promote competition, such as creating incentives for new entrants, facilitating the integration of renewable resources, and encouraging demand-side participation.
- **Regulatory Oversight:** Strengthen regulatory oversight to prevent market manipulation and enforce competition rules effectively.
- **Transparency:** Enhance transparency in market operations, including pricing mechanisms and data sharing, to ensure that all market participants have equal access to information (especially demand-side data for electricity demand functions – helpful for researchers to estimate mark-ups over time).
- **Stakeholder Engagement:** Engage with industry stakeholders, including consumers, generators and regulators, to gather input on competition issues and potential solutions.
- **Scenario-Based Analysis:** Conduct scenario-based analysis to assess how changes in market dynamics, such as shifts in generation mix or the emergence of new technologies, may impact competition. This can help proactively identify potential issues.
- **Proactive Measures:** Take proactive measures to address competition concerns rather than waiting for issues to become critical. This may involve introducing pro-competitive policies, encouraging new entrants, and promoting innovation in the market.
- **Review and Adapt**: Periodically review and adapt competition policies and regulations to address evolving market dynamics and emerging competition issues.
- **International Benchmarking:** Benchmark the electricity market against international best practices and experiences to identify areas for improvement.

A combination of monitoring, regulation, market design improvements, and stakeholder collaboration is essential to ensure workable competition in the electricity market and to identify and address any competition issues that may arise in the future.

21. Should structural changes be looked at now to address competition issues, in case they are needed with urgency if conduct measures prove inadequate?

It is advisable to consider structural changes alongside conduct measures as a proactive strategy to address potential competition issues in the electricity market. While conduct

measures can be effective in the short term, structural changes, if needed, may take time to implement. By exploring structural changes concurrently, one can be prepared to act swiftly if conduct measures are found to be insufficient. This approach allows for flexibility and a more comprehensive strategy to ensure competition and market fairness.

The Market Development Advisory Group (MDAG)'s preferred structural measure ('virtual' disaggregation of storage capacity – see Section 162) has merits and should be fully examined.

22. Is there a case for either vertical separation measures (generation from retail) or horizontal market separation measures (amending the geographic footprint of any gentailer) and, if so, what is this?

The case for vertical or horizontal separation measures depends on the specific circumstances and competition dynamics of the electricity market. Vertical separation and horizontal market separation are potential measures to address competition concerns.

Vertical separation, which separates generation from retail operations, can reduce the potential for generators to exert market power in the retail market. Horizontal market separation, which involves amending the geographic footprint of gentailers, can enhance competition by preventing excessive concentration in specific regions.

Whether these measures are warranted depends on the specific market dynamics and competition issues identified. Careful analysis is required to determine the appropriate approach and its potential impact on market participants, consumers, and overall market performance.

23. Are measures needed to improve liquidity in contract markets and/or to limit generator market power being used in retail markets? If yes, what measures do you have in mind, and what would be the costs and benefits?

Measures to improve liquidity in contract markets and limit generator market power in retail markets can enhance competition. Potential measures include:

- **Market-Making Services:** Introducing market-making services to facilitate trading in contracts, especially for shaped hedge products, can improve liquidity and price discovery.
- **Regulated Access pricing:** Regulated access to certain contract types can ensure fair access for all market participants, preventing gentailers from leveraging their market power in the retail sector.

Costs and benefits of such measures would depend on the specifics of implementation and market conditions. Improved liquidity and fair access can benefit consumers through increased competition including competitive pricing and choice, while the costs may involve regulatory and administrative expenses, and potential impacts on market participants.

24. Should an access pricing regime be looked at more closely to improve retail competition (beyond the flexibility access code proposed by the Market Development Advisory Group or MDAG)?

Yes, an access pricing regime should be explored further as it can contribute to improving retail competition. Beyond the proposed flexibility access code, a comprehensive access pricing regime can help ensure fair and equitable access to critical resources in the electricity market, fostering competition and reducing the potential for market power abuse. However, the design and implementation of such a regime should consider the potential impact on market dynamics and the costs and benefits associated with its introduction.

25. What extra measures around electricity market competition, if any, do you think the government should explore or develop?

Additional measures to promote electricity market competition could include:

- **Enhanced Data Sharing:** Encourage improved data sharing and transparency in market operations, pricing mechanisms, and contract details among market participants to facilitate informed decision-making and prevent information asymmetry.
- **Regulatory Market Monitoring:** Strengthen regulatory oversight to monitor market behaviour, pricing trends and concentration levels, and address competition issues proactively, including regular assessments and reporting on market performance.
- **Incentives for New Entrants:** Create incentives for new entrants to invest in renewable generation capacity and participate in the market, promoting diversity and competition. An example of this could be feed-in tariffs to stimulate growth of small-scale solar and wind electricity generators.
- **Consumer Protection:** Develop measures to protect consumers from potential abuses of market power and ensure they have access to competitive pricing and service choices.
- **Long-Term Investment Incentives:** Implementing policies that encourage long-term investments in renewable and flexible generation.

These measures should be explored in consultation with industry stakeholders and experts to determine their feasibility and potential impact on competition and market efficiency.

26. Do you think a single buyer model for the wholesale electricity market should be looked at further? If so, why? If not, why not?

Whether a single buyer model for the wholesale electricity market should be looked at further depends on the specific goals and priorities of policymakers and stakeholders in New Zealand's electricity market. Some factors to consider when evaluating whether to explore the single buyer model further include:

Arguments for Exploring the Single Buyer Model:

- **Market Power Mitigation:** If there are significant concerns about market power held by generators in the current market structure, a single buyer model could be explored as a means to mitigate this power. It would allow the central agency to make dispatch decisions, reducing the influence of generators.
- **Coordination Efficiency:** The single buyer model can potentially lead to greater coordination efficiency in the planning of generation and transmission investments. This could help optimise the electricity system and reduce inefficiencies.
- **Price Stability:** If there is a desire for more stable and predictable electricity prices, a single buyer can choose to sell electricity at a long-run average price. This could provide price stability for consumers and businesses.

Arguments against Exploring the Single Buyer Model:

- **Complex Transition:** Transitioning from the current market model to a single buyer model would be complex and could disrupt investment in new generation during the

transition period. This could lead to delays in new generation projects, affecting energy supply.

- **Loss of Investment Efficiency:** In the current market model, market signals, such as spot prices and contract prices, provide relatively efficient signals for investment. A shift to a single buyer model may result in less efficient allocation of resources and potentially lower investment in new generation.
- **Limited Diversity of Views:** A single buyer model may limit diversity and plurality of views about risk and approaches to risk management in the electricity market. Market participants may have different strategies and risk tolerances, which could be reduced in a centralised model.
- **Distributional Impacts:** A single buyer may employ average cost pricing to address distributional objectives. While this can help address social equity concerns, it may also result in inefficiencies and disincentives for efficient resource use.
- **Implementation Complexity:** Establishing a single buyer model would require significant design and implementation complexity. It would involve overhauling the existing market structure and may require changes to regulations and infrastructure.

Any decision to explore the single buyer model further should be made based on a careful evaluation of the pros and cons, taking into account the specific goals and challenges of the New Zealand electricity market.

Stakeholder input and a thorough cost-benefit analysis would be essential in making an informed decision on whether to proceed with such a significant structural change, to ensure that such a model would produce more net benefit than the status quo.

Part 3: Networks for the Future

27.	Do you consider that the balance of risks between investing too late and too early in electricity transmission may have changed, compared to historically? If so, why?
	Yes, due to the growth in electrification, the rate of which is likely to increase substantially during the next decade. Given the time lag required to expand/upgrade the transmission network, it is important to take substantive measures to make the necessary investments as soon as possible.
28.	Are there any additional actions needed to ensure enough focus and investment on maintaining a resilient national grid?
	Since system resilience and security are public goods, and since a flat fee levied to finance system maintenance and investment is regressive, the government should consider utilising income taxes to finance the expenses instead rather than additional actions.
29.	Do you agree we have identified the biggest issues with existing regulation of electricity distribution networks?
	The consultation appears to have addressed the biggest issues. The swiftness of the Network investment model is vital. With rapid advancements in renewable technologies and their associated demands, regulatory frameworks must evolve swiftly. Barriers to connection, particularly inconsistent policies across distribution businesses, are concerning. Streamlining these inconsistencies is essential for efficiently meeting increasing energy demands. From a financial standpoint, the method of cost allocation is concerning. Charging initial connectors for anticipatory upgrades might dissuade them, leading to less optimal investments. Distributing these costs equitably could incentivise more rapid expansion and optimal network use. The role of pricing signals is also pivotal. Properly aligned signals influence both provider actions and consumer habits. Misaligned signals can inadvertently introduce inefficiencies and

deter renewable energy adoption.

While the highlighted areas are crucial, a holistic analysis should also encompass other aspects. Technological innovations, especially in energy storage, smart grids, and demand-side management, also deserve attention.

30. Are there pressing issues related to the electricity distribution system where you think new measures should be looked at, aside from those highlighted in this document? How would you prioritise resolving these issues to best enable the energy transition?

A smooth transition of our electricity distribution networks requires a strategic, multi-layered approach. First, immediate safety and reliability issues must be tackled. Prioritising infrastructure upgrades lays a foundation for a reliable, safe grid, paving the way for subsequent projects. Once this foundation is laid out, the focus should transition to technological integration. It is important for the grid to seamlessly integrate distributed energy storage and support consumer-based energy production. Such advancements are key to amplifying the uptake and utilisation of renewables. However, as the grid evolves, its cyber defences must be bolstered to safeguard our interconnected system.

Following this, there is a pressing need to promote energy efficiency and conservation. But these technological and strategic shifts require a skilled workforce. It is paramount to invest in training programs, cultivating professionals capable of driving this change and maintaining the growing systems.

Grid modernisation should not be considered a solo effort; it is a communal journey. Engaging with stakeholders continuously is essential. Such interactions provide diverse insights, enabling refined strategies. Open communication also strengthens public trust, ensuring community support and participation in this transformative venture.

31. Are the issues raised by electricity distributors in terms of how they are regulated real barriers to efficient network investment?

Please give reasons for your answer. Is there enough scope to address these issues with the current ways distributors are regulated? If not, what steps would you suggest to address these issues?

Electricity distributors' concerns about potential barriers are valid, but they must be viewed within a broader framework. Many existing regulations prioritise consumer protection, shielding against possible monopolistic tendencies by distributors. This ensures fair pricing and quality service for consumers. The regulatory arena reflects diverse interests, encompassing not just distributors but consumers and environmentalists, among other groups. In essence, while distributors' issues are real and pressing, solutions should embrace a comprehensive perspective, balancing varied stakeholder interests and upholding the electricity system's long-term robustness.

32. Are there other regulatory or practical barriers to efficient network investment by electricity distributors that should be thought about for the future?

A foremost challenge is the extended nature of regulatory approval processes. Prolonged procedures can cause bottlenecks, particularly when swift reactions to technological or market changes are needed. These delays can hinder essential progress. Exacerbating the issue is occasional regulatory ambiguity, making distributors cautious due to potential non-compliance risks or unforeseen regulatory shifts. Additionally, interconnection standards, especially non-standardised ones, can deter the integration of new renewable resources. Regulations that

overly focus on the present without considering future trends, such as EV proliferation, may result in limited investments. Moreover, data-intensive modern grids amplify concerns around data privacy.

33. What are your views on the connection costs electricity distributors charge for accessing their networks? Are connection costs unnecessarily high and not reflective of underlying costs, or not? If they are, why do you think this is occurring?

Stakeholders may perceive that connection costs might be disproportionately high. This perception could stem from several factors, including insufficient regulatory controls, the monopolistic structure of electricity distribution, and unforeseen expenses. Hence, fairness and sustainable energy practices in connection fees are vital. In such cases, transparency is the key: distributors must provide clear explanations of their connection costs, benefitting both consumers and regulatory bodies. Independent/third-party regulators play a critical role, tasked with periodically reviewing these fees to ensure they meet approved standards. Connection fees should reflect actual costs. Overcharging with overly forward-looking fees could deter new participants, particularly those advocating for renewable energy sources.

34. If you think there are issues with the cost of connecting to distribution networks, how can government deliver solutions to these issues?

The government could consider the following:

- Enhanced regulatory oversight is fundamental. Independent bodies should be empowered to oversee and adjust connection fees. Given the dynamic nature of technology and economics, these regulations should be reviewed periodically, aligning with contemporary needs.
- Introducing competition elements, such as unbundling services, can drive efficiency. Cost-reflective pricing, mirroring actual costs, and dynamic pricing models can promote efficient network usage.
- Grid decentralisation: Promoting microgrids or local energy sources like wind farms or solar panels can reduce reliance on extensive infrastructure.
- Consumer protection is important. Advocacy groups ensure consumers' interests during regulatory discussions, and straightforward grievance redressal mechanisms can enhance trust.
- Educating the public and businesses about connection costs and renewable energy benefits can influence policies.
- Transparency is vital. Distributors must detail connection costs, and standard fees for common scenarios should be publicly available.

35. Would applying the pricing principles in Part 6 of the Code to new load connections help with any connection challenges faced by public EV chargers and process heat customers? Are there other approaches that could be better?

Public EV chargers' integration into the electricity grid offers both challenges and opportunities. Economies of scale suggest that clustering EV chargers can reduce per-unit connection charges. By reflecting this in pricing, we can encourage EV charger expansion. Additionally, EV chargers with smart charging offer demand flexibility to the grid, adjusting their needs based on grid conditions. Pricing models that reward such adaptability can further boost their adoption. Process heat customers, who value power reliability, may have specific needs. Differentiated pricing, through tiered systems or premium services, can address their

demands, making connections more attractive.

Collaborative grid planning, involving various stakeholders, can help identify optimal connection zones and formulate solutions. Standardised connection processes can minimise administrative complexities for potential entrants. Moreover, dynamic pricing models, leveraging time-of-use rates, can motivate operations during off-peak periods, an attractive option for EV chargers. Ultimately, the success of these efforts hinges on a robust and modern grid infrastructure. Investing proactively in the grid ensures it can handle diverse loads, mitigating future connection challenges.

36. Are there any challenges with connecting distributed generation (rather than load customers) to distribution networks?

Connecting distributed generation (DG) to distribution networks presents distinct challenges compared to traditional connections. DG can reverse the traditional one-way power flow, which runs from substations to consumers, challenging older infrastructures. It can also interfere with the network's protective mechanisms, risking safety and reliability. Operationally, intermittent DG introduces supply-demand balancing complexities. Another challenge emerges if a grid segment gets isolated and DG continues operating, it results in a localised power supply, posing threats to equipment/personnel. Economically, DG integration prompts debates about cost allocation for necessary grid upgrades. Determining fair compensation for DG owners supplying excess electricity becomes crucial. As more consumers in Aotearoa become prosumers (see the trend in Australia), traditional utility revenue models face challenges. Regulatorily, a lack of standardised interconnection procedures can cause inefficiencies and delays. Ensuring unbiased grid access for all DG providers is essential, especially when capacity is limited.

DG also calls for re-evaluating traditional grid planning, given its unpredictable nature. If someone can't afford or access DG yet incur high grid maintenance costs, it's problematic. Some DG projects might also face local resistance due to cultural or environmental reasons.

37. Are there different cost allocation models addressing first mover disadvantage (when connecting to distribution networks) which the Electricity Authority should explore, potentially in conjunction with the Commerce Commission?

Two models to consider:

- Incremental Cost Sharing Model: First users pay initial costs; subsequent joiners share these costs, reducing the initiator's burden.
- Beneficiary Pays Model: Users are charged based on their upgrade benefit; those benefiting more pay more.

38. Should the Electricity Authority look at more prescriptive regulation of electricity distributors' pricing? What key things would need to be looked at and included in more prescriptive pricing regulation?

N/A

39. Do current arrangements support enough co-ordination between the Electricity Authority and the Commerce Commission when regulating electricity distributors? If not, what actions do you think should be taken to provide appropriate co-ordination?

Some actions are suggested below:

- Build regular consultations between the entities. This could facilitate continuous dialogue, ensuring challenges are swiftly addressed. Collecting feedback from electricity distributors and stakeholders reveals areas needing better collaboration.
- Provide shared data and research. This could further streamline decision-making, with both entities pooling resources for data collection and analysis.
- Training and Cross-Posting initiatives can foster mutual understanding and teamwork. Staff exchanges and joint training promote a collaborative ethos.
- Public communication should be synchronised. Before releasing impactful statements, both entities should consult each other to ensure clear and consistent messaging for the public.

40. Will the existing statutory objectives of the Electricity Authority and Commerce Commission adequately support key objectives for the energy transition?

The Electricity Authority and the Commerce Commission have established statutory objectives that guide their operations and decision-making processes. Specifically:

- Electricity Authority's Objectives: The primary objective of the Electricity Authority is to promote competition, reliable supply, and efficient operation in the electricity industry for the long-term benefit of consumers. Additionally, the Authority has an ancillary objective to protect the interests of household and small business consumers in the provision of electricity to these consumers. This ancillary objective applies only to the Authority's transactional activities with household and small business consumers. [Page 86]
- Commerce Commission's Objectives: Under Section 52A of the Commerce Act 1986, the purpose of the Commerce Commission's regulation of natural monopoly infrastructure is to promote the long-term benefit of consumers. This is achieved by promoting outcomes consistent with those produced in competitive markets, providing regulated suppliers with incentives to innovate and invest, including in replacement, upgraded, and new assets, sharing the benefits of efficiency gains with consumers, including through lower prices, and limiting their ability to extract excessive profits. [Page 87]
- Re-evaluation of Objectives: A review of electricity pricing in 2018-2019 considered whether the statutory objectives of the Authority and Commission should be amended to include environmental and equity objectives. The conclusion of this review was that adding to their existing objectives might risk giving the regulators too many directions, necessitating difficult trade-offs between competing objectives and blurring their accountability. However, the review did identify a regulatory gap in the protection of household and small business consumers, leading to subsequent amendments to the Electricity Industry Act 2010, which introduced an additional consumer protection objective for the Authority, effective from 31 December 2022. [Page 89]

  The Commerce Commission has articulated its position on how Part 4 relates to Section 5ZN of the Climate Change Response Act 2002 (CCRA), considering the purpose of Part 4 of the Commerce Act 1986 and relevant court decisions. The Commission believes that it can consider the permissive considerations in Section 5ZN, even if those considerations do not, in themselves, promote the purpose in Section 52A, as long as they are not inconsistent with that purpose. [Page 89]
- Stakeholder Views: The Electricity Networks Aotearoa (ENA) strongly believes that the Commission should explicitly recognize that addressing climate change is in the long-term interest of consumers. [Page 89]

The Climate Change Commission, in its recent draft advice to the government on the second emissions reduction plan, noted the need for future-proofing the existing regulated investment framework for transmission and distribution infrastructure by seeking to deliver outcomes consistent with emissions reduction, system security and reliability, and affordability. [Page 90]

- Potential Updates: There's an ongoing discussion about whether there's a need for objectives update for the market regulators, especially considering potential updates similar to those described in Box 8 in Australia, or the issuance of a Government Policy Statement (GPS). [Page 90]

While the existing statutory objectives of the Electricity Authority and Commerce Commission are designed to ensure competition, reliability, and efficiency in the electricity market and the long-term benefit of consumers, the evolving challenges of climate change and sustainability might necessitate a re-evaluation. The current objectives might not fully align with the broader goals of energy transition, especially in the context of emissions reduction and environmental sustainability. Further discussions and considerations are essential to determine if and how these objectives should be updated to better support the key objectives of the energy transition.

41. Should the Electricity Authority and/or the Commerce Commission have explicit objectives relating to emissions reduction targets and plans set out in law? If so,

- should those objectives be required to have equal weight to their existing objectives set in law?

Why and how might those objectives affect the regulators' activities?

Considering the global urgency of climate change and New Zealand's commitment to reducing greenhouse gas emissions, it might be prudent for the Electricity Authority and the Commerce Commission to have explicit objectives related to emissions reduction targets set out in law.

If so, given the pressing nature of climate change, these new objectives should be given significant weight. However, it is essential to ensure a balanced approach, where these new objectives complement, rather than conflict with, the existing objectives. The current primary mandates of the Electricity Authority and the Commerce Commission are to promote competition, reliable supply, and efficient operation, all for the long-term benefit of consumers. [Page 86 & 87]

Why and how might those objectives affect the regulators' activities? Here are the reasons:

- Broadening of Regulatory Scope: Introducing climate change objectives would broaden the regulatory scope of both entities, requiring them to factor in environmental considerations in their decision-making processes.
- Potential Trade-offs: As highlighted in the 2018-2019 electricity price review, expanding the current objectives might necessitate difficult trade-offs between competing objectives, potentially blurring the regulators' accountability. [Page 88]
- Stakeholder Engagement: The regulators might need to engage more closely with stakeholders, especially industry players, to ensure that the new objectives are met without compromising the existing ones. For instance, the Electricity Networks Aotearoa (ENA) suggests that addressing climate change aligns with the long-term interests of consumers. [Page 88]
- Alignment with International Practices: Taking cues from international practices, like Australia's consideration of introducing a distinct emissions reduction objective, can provide a roadmap for the regulators. [Page 89]

- Potential for New Regulatory Mechanisms: The introduction of new objectives might necessitate the development of new regulatory tools or mechanisms to ensure that the electricity market aligns with both the existing and new objectives.

While introducing new objectives related to emissions reduction is essential given the global climate crisis, it is crucial to ensure that these objectives are integrated seamlessly with the existing ones, ensuring a balanced approach to regulation.

42. Should the Electricity Authority and/or the Commerce Commission have other new objectives set out in law and, if so, which and why?

Yes, both the Electricity Authority and the Commerce Commission should consider integrating new objectives into their legal framework, specifically those related to climate change and sustainability. This necessity stems from the global urgency of climate change and New Zealand's commitment to reducing greenhouse gas emissions.

Which objectives and why?

- Climate Change and Sustainability Goals: Given the pressing global climate crisis and New Zealand's environmental commitments, it is imperative to embed explicit climate change and sustainability objectives within the legal mandates of both the Electricity Authority and the Commerce Commission. This integration will ensure a more environmentally conscious approach in the electricity sector's development and decision-making processes.
- Clear Mechanisms for Balancing Objectives: If new objectives are set, there must be clear mechanisms in place to balance these with existing objectives. This is crucial when conflicts arise between climate change goals and economic efficiency objectives, necessitating a framework for prioritisation or reconciliation.
- Enhanced Transparency and Accountability: To ensure the effective implementation of new objectives, there should be an emphasis on improved transparency and accountability within these regulatory bodies. This could be achieved through regular reporting on progress towards these objectives, thereby keeping the process open to public scrutiny and feedback.
- Extensive Consultation: It's recommended to undertake broad public and industry consultations before establishing new objectives. This approach ensures that the interests and viewpoints of all parties are considered, leading to more balanced and accepted regulations.
- Continuous Assessment and Adjustment: With the advancement of technology and market dynamics, there should be a system for the regular evaluation of the relevance and effectiveness of these objectives, with adjustments made as necessary.
- Learning from International Experience: New Zealand can draw valuable lessons from countries like Australia, which is considering introducing explicit new emissions reduction targets in its national energy objectives. Learning from such international experiences can help New Zealand formulate and implement new objectives more effectively.

Considering the urgency of climate change and the pivotal role of the electricity sector in achieving sustainable development, it is reasonable to set new objectives related to climate change and sustainability for both the Electricity Authority and the Commerce Commission. However, it is crucial to ensure a balanced consideration of all stakeholders' interests and to establish synergy between new and existing objectives.

43.	Is there a case for central government to direct the Commerce Commission, when dealing with Electricity Distributors and Transpower, to take account of climate change objectives by amending the Commerce Act and/or through a Government Policy Statement (GPS)?

Context and Current Framework:

- The global urgency of climate change necessitates that all sectors, including the electricity industry, align their operations and strategies with climate change mitigation and adaptation goals. The Commerce Commission, as a regulatory body, plays a pivotal role in this alignment. However, its current statutory objectives, as defined in the Commerce Act 1986, might not fully encapsulate the pressing demands of climate change. [Page 87]
- Stakeholder Perspectives:
    - Entities like the Electricity Networks Aotearoa (ENA) emphasise the intrinsic link between addressing climate change and the long-term interests of consumers. Their stance suggests that mitigating climate change is not just an environmental imperative but also an economic one, ensuring sustainable and reliable electricity for consumers in the long run. [Page 88]
- International Benchmarking:
    - Australia's consideration of introducing a distinct emissions reduction objective offers a potential model for New Zealand. Such an objective can provide clarity and direction, ensuring that the electricity sector is unequivocally aligned with national and global decarbonisation goals. [Page 89]
- Recommendations:
    - Legislative Amendments: A revision of the Commerce Act 1986 is worth considering. By integrating explicit climate change objectives into the Act, the government can ensure that the Commerce Commission's regulatory decisions are in sync with New Zealand's broader environmental and sustainability goals.
    - Government Policy Statement (GPS): Issuing a GPS can provide additional clarity. Such a statement can articulate the government's expectations, ensuring that regulatory settings for electricity networks are congruent with climate change objectives. This would guide the Commerce Commission in its dealings with Electricity Distributors and Transpower, ensuring that investment decisions, regulatory frameworks, and market operations support New Zealand's climate change goals. [Page 5]
    - Stakeholder Collaboration: Engaging with stakeholders, from industry players to environmental groups, can provide a holistic perspective. Their insights can guide policy formulation, ensuring that the objectives are both ambitious and pragmatic.
    - Continuous Review: The dynamic nature of climate change, coupled with technological advancements in the electricity sector, necessitates a periodic review of objectives. This ensures that they remain relevant and effective.
- Potential Challenges:
    - Balancing Multiple Objectives: While integrating climate change objectives is crucial, the Commerce Commission also has other statutory objectives to consider. Striking a balance might pose challenges.
    - Economic Implications: There might be concerns about the economic implications of stringent climate change objectives, especially in terms of investment in the electricity sector.
    - Stakeholder Resistance: Not all stakeholders might be on board with significant changes, especially if they perceive them as disruptive to their current operations.

While the existing statutory objectives of the Commerce Commission provide a framework for its regulatory decisions, there is a compelling case for them to be updated or supplemented to adequately address the challenges and opportunities presented by climate change. This would ensure that New Zealand's electricity sector is not only efficient and competitive but also sustainable and resilient in the face of global environmental challenges.

44. If you answered yes to question 43, please explain why and indicate:

- What measures should be used to provide direction to the Commerce Commission and what specific issues should be addressed?

How would investment in electricity networks be impacted by a direction requiring more explicit consideration of climate change objectives? Please provide evidence.

The urgency of global climate change necessitates a proactive approach in all sectors, including the electricity industry. Ensuring that the Commerce Commission's regulatory framework aligns with climate change objectives is crucial for New Zealand's sustainable future. This alignment not only addresses environmental concerns but also ensures the long-term reliability and efficiency of the electricity sector in the face of changing climate patterns.

Potential measures for directions and issues to address include:

- **Government Policy Statement (GPS):** A GPS can serve as a pivotal tool to provide clear direction to the Commerce Commission. It can articulate the government's expectations, especially when formulating market rules and evaluating investment proposals for Transpower and electricity networks. Such a statement ensures that the regulatory framework is in harmony with climate change objectives and conveys anticipated consumer benefits related to electricity network investments. [Page 90]
- **Revising Statutory Objectives**: Drawing inspiration from international models, like Australia's consideration of introducing a distinct emissions reduction objective, New Zealand can contemplate similar updates. Such objectives can send unambiguous signals about the government's commitment to a decarbonized, modern, and reliable grid. [Page 89]

In terms of potential impact on investment in electricity networks:

- **Recommendations from the Climate Change Commission**: The Climate Change Commission's recent draft advice for the second emissions reduction plan underscores the need for a futuristic approach to the existing regulated investment framework for transmission and distribution infrastructure. This suggests that to achieve outcomes related to emissions reduction, system safety and reliability, and affordability, adjustments to the current investment framework might be essential. [Page 88]

In essence, aligning the Commerce Commission's regulatory framework with climate change objectives is not just an environmental imperative but also a strategic move to ensure the resilience and sustainability of New Zealand's electricity sector. This alignment might necessitate a blend of policy directives, legislative amendments, and stakeholder engagement, ensuring that investments in the electricity network are future-proofed against the challenges posed by climate change.

Part 4: Responsive Demand and Smarter Systems

45.	Would government setting out the future structure of a common digital energy infrastructure (to allow trading of distributed flexibility) support co-ordinated action to increase use of distributed flexibility?
	Yes. As mentioned in MBIE's report, the multiple trading relationships pilot under development now is prohibited under the Electricity Industry Participation Code 2010 (Code). Such pilots need an exemption before being carried out. Government should play an essential role in supporting distributed flexibility into the future. Measures on this topic that NZ government should be considering at this point include revising the current Code to promote more exercise or research in field, setting up of official short-, medium- and long-term goals in the digital energy infrastructure field and establishing a detailed market standard such as the measures to be included in the country's plan.
46.	Should central government see how demonstrations and innovation to help inform how trade of flexibility evolves in the New Zealand context, before providing direction to support trade of distributed flexibility? If yes, how else could government support the sector to collaborate and invest in digitalisation now?
	Yes, before providing a specific direction to support the distributed flexibility in New Zealand, related research and pilot projects are necessary in the field. Government should play a leadership role in helping related participants in removing the barriers of carrying out such projects, including the regulation issues discussed in the previous question. Government could also get involved in such project by helping to choose the location, giving financial assistance, and bringing more local agencies into the project. A small scale pilot is already underway but multiple other projects have been tested in Australia and the UK and now are doing more at a large scale. Extending the current pilot to scale up to more consumers and allow for trade (especially those with different energy needs/characteristics) would be beneficial.
47.	Aside from work already underway, are there other areas where government should support collaboration to help grow and develop flexibility markets and improve outcomes? If yes, what areas and actions are a priority?
	As briefly discussed in question 46, governments can facilitate the establishment of industry standards and protocols that enable interoperability among different flexibility market participants. This should be considered as a priority as well as the revision in Code and regulations as they both serve as the pre-requisite for successful pilots in DER or CER.
48.	Could co-funding for procurement of non-network services help address barriers to uptake of non-network solutions (NNS) by electricity distributors?
	From the MBIE report itself, it seems the largest barrier for distributors to adapt the NNS is the difficulty and high cost of integrating it into the existing networks, especially for the large number of small distributors. Additional funding for procurement of NNS would definitely lead to some increase of NNS uptake rate in the short term, but whether it is a sustainable solution to this problem remains questionable.
49.	Would measures to maximise existing distribution network use and provide system reliability (such as dynamic operating envelopes) help in New Zealand? If yes, what actions should be taken to support this?
	N/A
50.	What do you think of the approaches to smart device standards and cyber security outlined in this document? Are there other issues or options that should be looked at?

The UK's Energy Security Bill outlined in the document is a good exemplar for New Zealand to establish its own cyber-security code. Digital infrastructure, open source (software) and open data are the three main aspects that brings new challenges and risks into the energy sector in keeping the system secure, robust and reliable.

51. Do you think government should provide innovation funding for automated device registration? If not, what would best ensure smart devices are made visible?

Yes. Government's support in financial terms should be equally important as support in the regulatory side. In addition to direct funding, government could play a role in bridging the automated device developer and large energy companies.

52. Are extra measures needed to grow use of retail tariffs that reward flexibility, so as to support investment in CER and improved consumer choice and affordability?

Compared to preferable retail tariffs, a larger barrier in promoting CES uptake still lies in the high initial investment occurs to the potential customers. To create the incentive for more consumers to invest in CER, a subsidy project like the EV subsidy that has been taken place can be considered.

53. Should the government consider ways to create more investment certainty for local battery storage? If so, what technology should be looked at for this?

Yes. Investment in battery storage is, in most cases, beyond the capability of single or even a small group of consumers. If such investment could be led by government, jointly with some companies, then the established battery storage system could be rented at the community level. Both the residential units that form the community and the company which maintains the storage system could benefit from this shared energy scheme, the efficiency of which has been demonstrated in published research papers (Tushar et al, 2016). Although the government's role in such scheme has not been discussed widely in economic papers, we believe government's involvement could facilitate the establishment of shared energy storage system in New Zealand.

54. Should further thought be given to making upfront money accessible to all household types, at all income levels, for household battery storage or other types of CER?

Previous studies have shown that low-income households are much less likely to have access to battery storage or other types of CER due to financial difficulties. According to the Energy Hardship report published recently by MBIE, low-income households, as well as Māori and Pacifica households, are overwhelmingly more likely to confront energy hardship in New Zealand. Financial assistance could be made accessible to households that experience some level of energy hardship, defined by the MBIE standard. Compared to short-term financial assistance schemes, supportive measures in investing in CER could be a long-term solution to energy hardship, whilst at the same time increasing the uptake of CER.

55. Should government think about ways to reduce 'soft costs' (like the cost of regulations, sourcing products, and upskilling supplier staff) for installing local battery storage with solar and other forms of CER/DER storage? If so, what technology should be looked at?

Yes. Reduction in soft costs could benefit the companies who run the large-scale local battery storage system by decreasing their operating cost. Then the consumers (households or communities) who use the storage service could negotiate with the operators for a lower price. For battery storage schemes, a more efficient and feasible plan may be to invest in large scale storage systems run by professional companies. The storage system could be either community owned or private company owned. Households which want to use the storage

service could join in a community to rent the system and pay for the storage service and maintenance fee.

56. Is a regulatory review of critical data availability needed? If so, what issues should be looked at in the review?

Yes. Again, with increasing uptake rate of DER and CER in New Zealand, it is possible to create a system similar to the national level Virtual Energy System developed in the UK. The data generated by such a system are vital to NZ's energy sector and there should be a regulatory view of data availability. For different groups involved in the system (energy producers, retailers and distributors, industrial users, residential users), different levels of data accessibility should be assigned under an official regulatory review.

Part 5: Whole-of-system considerations

57. What measures do you consider the government should prioritise to support the transition?

Based on the measures that discussed in the report, an orderly exit from current fossil fuel electricity generation and investment in new renewable generation needed for electrification would generate the largest impact on the transition in energy sector, so these are also things government should prioritise.

58. Are there gaps in terms of information co-ordination or direction for decision-making as we transition towards an expanded and more highly renewable electricity system and meeting our emissions goals? Please provide examples of what you'd like to see in this area.

As discussed earlier, with the rapid emergence of new technology in this field, regulations and jurisdictions in New Zealand are lagging behind those in Australia and the UK. The recent progress on defining energy hardship in New Zealand led by MBIE could be a very good exemplar, making NZ one of the leading countries in analysing energy hardship problems at the government level. Based on the official standard established, it is easier to tackle the problem and design corresponding schemes to solve the problem. We would expect to see such procedures and efforts led by MBIE in the renewable electricity field.

59. Are there significant advantages in adopting a REZ model, or a central planning model (like the NSW EnergyCo), to coordinate electricity transmission investment in New Zealand?

Would a REZ model for local electricity distribution be an effective means of addressing first mover disadvantage with connecting to electricity distribution networks?

The Renewable Energy Zone(REZ) model shows promise in incentivising generation. The first REZ in the Central-West Orana Region in NSW Australia received 113 registrations of interest representing 27 gigawatts of new energy generation and storage projects in 2020, exceeding the amount of energy required to deliver the REZ.

Any replication in New Zealand would require governments or other actors to play the co-ordination role in bringing potential energy generation investors together and facilitating construction of transmission infrastructure to the grid. Any adoption of the REZ model should also incorporate lessons learned from the current Australian REZ rollouts.

Given that some of the potential REZ areas in NSW are arrays of vacant land, in areas with fossil fuel power stations to be decommissioned, or on former mining land, these factors should be considered in how a REZ model would work locally and for employment opportunities in the transition from fossil fuels.

60.	Should MBIE regularly publish opportunities for generation investment to enable informed market decision-making?
	Yes. We believe that MBIE is publishing some related information now.
61.	How should the government balance the aims of sustainability, reliability and affordability as we transition to a renewable electricity system?
	For the energy trilemma in NZ, government has more power in controlling the sustainability and reliability aspects of the energy sector as government investment could generate huge direct impacts on these. The level of affordability is more likely to be determined by market conditions, especially now that NZ is increasingly relying on imports of coal and fuels. In addition, New Zealand's equity score in the energy sector has remained consistently high over the past twenty years. In this case, as we transition to a renewable electricity system, the NZ government should place more emphasis on the sustainability and reliability aspects as they have more controlling power and at the same time carry assistance projects with a focus on energy hardship groups to maintain the current equity level.
62.	To what extent should wholesale, transmission, distribution or retail electricity pricing be influenced by objectives beyond the (affordability-related) efficiencies achieved by cost-reflective pricing, such as sustainability, or equity?
	The electricity price should be determined by the market, while the government could play a role in designing some related schemes or projects to improve energy sustainability or equity in this country.
63.	Are the current objectives for the system's regulators set in law (generally focusing on economic efficiency) appropriate, or should these also include more focussed objectives of equity and/or affordability?
	Equity is something government should step into in the energy sector by providing equal access to energy for different population groups in the country. Improvement in affordability can only be achieved through better design of market mechanisms; government assistance in financial terms is more likely to generate short-term alleviation rather than long-term improvement. Whether it should be legislated or not would be up to the government of the day to decide.
General Comments:	