2 July 2021

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Chief Executive
Infrastructure Commission

Submitted via online upload

Tēnā koe Ross

Electricity Authority submission to Infrastructure Commission's strategy consultation

We welcome consultation by Te Waihanga, the Infrastructure Commission (InfraCom) on its infrastructure strategy consultation document, *He Tūāpapa ki te Ora – Infrastructure for a Better Future*[1]. We appreciate the opportunity to provide you with a submission.

In this submission, we have focussed our response to the issues raised in section F2, *Transition energy infrastructure for a zero-carbon 2050*. Our main points of submission are that:

- The electricity distribution sector has a critical role to play in the energy transition, and we are actively prioritising work on ensuring the distribution sector has the capability and the capacity to support broader electrification of the economy
- Incentives for investment in efficient levels of network capacity must be correct; this is an area on which we have been focussing intently for several years

The primary function of Te Mana Hiko, the Electricity Authority is to regulate New Zealand's electricity system and markets, enforcing the rules, and holding industry participants to account through active monitoring and enforcement. Where required, we facilitate the development and enhancement of the markets to ensure their robustness and the delivery of long-term benefits to consumers.

We promote competition in, reliable supply by, and the efficient operation of the electricity industry, for the long-term benefit of New Zealand's electricity consumers. We operate the electricity system and markets through a range of contracts with service providers, including Transpower.

We have appended to this letter the submission we wrote to He Pou a Rangi, the Climate Change Commission (the CCC)[2] in response to its draft advice. In it, we agreed with the CCC that transformation of the energy sector is critical to the transition to a low-emissions economy, and that the electricity sector has a significant role to play. We noted our interest is to ensure the transition happens efficiently, and, critically, that security of supply is maintained as New Zealand's energy system evolves.

[1] Available online at https://infracom.govt.nz/strategy/

[2] Available online at https://www.ea.govt.nz/about-us/what-we-do/working-with-other-agencies/

As we signalled to the CCC, the energy transition is an area in which we are deeply engaged. We are keen to discuss our work further with your team. Just as we offered to the CCC, we are willing and able to support InfraCom with independent, expert advice relevant to the electricity sector transition.

The electricity distribution sector has a critical role to play

The Authority is prioritising work on ensuring the distribution sector has the capability and the capacity to support the electrification of the economy. A key focus for the Authority is ensuring efficient investment in and operation of distributed energy resources (DER), for the benefit of all New Zealanders, not just those who own DER. Our work is relevant to draft recommendation F2.1, and we will keep InfraCom informed as this work develops.

Further, we are also providing a low-cost means for smaller-scale interaction with the wholesale market, through the new Dispatch Notification product to be introduced as part of real-time pricing. A key aim of this product is to enable efficient demand response, and market participation by other DER.

As part of the broader distribution sector workstream, the Authority is actively considering how to accelerate the transition to more efficient distribution pricing. Our most recent assessment of distributors' efforts to reform distribution tariffs (released in early 2021)[3] highlighted the slow overall pace of progress in pricing reform by distributors. While some distributors have made significant changes, the published plans of distributors for further pricing reform are generally incremental at best, vague, or in some cases, non-existent.

Incentives for investment in efficient levels of network capacity must be correct

InfraCom's draft recommendations include *F2.2: "Reduce barriers to building spare transmission capacity where that would reduce inefficient barriers to large-scale renewable generation and the electrification of large process heating units".* The approach recommended is to "*enable and encourage Transpower to temporarily defer charging customers for the costs of spare transmission capacity*".

On 30 June 2021, Transpower delivered to the Authority a proposed new transmission pricing methodology (TPM). The Authority will consider this before consulting on a new TPM later in 2021. Within this context, the Authority and Transpower are considering how to address the 'first mover disadvantage' (FMD) barrier faced by new connections – this arises as the cost of additional capacity is currently directed to the first connecting customer.

The Authority agrees that efficient investments in connection capacity for new generation or electrification of load should not be discouraged by requiring all the costs of excess connection capacity to fall on first movers. The Authority considers it important that Transpower faces incentives to right-size its grid over the long term, so it builds additional capacity where subsequent connecting customers – both generation and load – are reasonably expected. The Authority also aims to ensure proposals for additional capacity are appropriately considered and scrutinised, to avoid the risk of inefficient over-build which would ultimately create an extra cost to consumers.

The Authority is considering approaches available within the TPM to covering the costs associated with additional capacity. Transpower has recently suggested full socialisation of

[3] Available online at https://www.ea.govt.nz/operations/distribution/pricing/distribution-scorecards-2020/

these costs (all parties pay), but there are other options available within the TPM framework (for example beneficiaries pay).

There are also approaches to addressing FMD that fall outside the TPM, in which Transpower or its shareholder bear the risk of any investment in additional capacity. These include deferring charges, as suggested in InfraCom's draft recommendation. Transpower has the required resources, information and expertise to make it best-placed to take a long-term commercial view of this matter.

In Q8, InfraCom asks whether there is a role for renewable energy zones in achieving New Zealand's 2050 net-zero carbon emissions target. One of the major drivers of the TPM reform process has been to promote efficient investment in the combination of network infrastructure and generation to meet New Zealand's long-term energy needs. The new TPM, and nodal pricing in the wholesale electricity market, are designed to work in concert to deliver this. The new arrangements, including a solution to the additional capacity / FMD issues discussed above, may well deliver patterns of investment that resemble renewable energy zones (REZs), with transmission investment unlocking and enabling significant quantities of renewables in certain areas.

It is not clear at this point in time how material FMD issues may be, but for clarity, the FMD issues discussed above arise only from the *additional* portion of transmission investment. We would not support subsidisation of the portion of transmission capacity actually being used by new renewable generators (either within or outside a REZ) to export their generation to the grid. To do so may impact on an efficient and affordable transition, including by tilting the competitive playing field towards generation in the areas where this occurred.

Renewable energy zones may be a solution to increasing consenting efficiency

As discussed later in this submission, it will be critical that the consenting processes for new generation, and network infrastructure, are efficient and can proceed at pace. In this regard, designating certain zones for renewable development could assist with consenting – akin to deeming renewable generation in the zone to be of national significance. Given their significance, introducing such REZs could perhaps occur only if certain trigger criteria are met – for example if new planning instruments for renewable energy are not having the desired effect, and/or the rate at which new generation is being added to the system is not keeping pace with demand growth.

Our thinking in this area is continuing to evolve. We are happy to engage further with InfraCom on this issue.

The Authority supports development of a national energy strategy

The Authority supports the development of a national energy strategy. In response to Q7, our suggestions on what could be covered in that strategy were provided in the submission to the CCC.

In response to Q9, of the areas covered in MBIE's *Accelerating electrification* document, we believe the role of supporting, adjacent policy in facilitating the transition is the most critical. This includes, for example, how flexibility in existing hydro generation resources can be maintained or increased, and efficient consenting and reconsenting processes for both generation and network infrastructure. As noted in InfraCom's consultation document, the lead times for investments can be significant, especially for network investments impacting large numbers of landowners. It is important that consenting and reconsenting processes (including to obtain variations to existing consents to account for modern technology) are as efficient as possible.

Specifically, we support the Government exploring options to strengthen national direction for renewable electricity. We also support strengthening alignment between the objectives and policy direction for water reform and decarbonisation.

Experiences of different sectors can inform future approaches

One of the clear benefits of the formation of InfraCom is that it can look across the different infrastructure sectors in New Zealand and make recommendations based on the relative strengths and weaknesses of the various sectors' approaches.

We noted InfraCom's discussion on the evolution of pricing approaches for infrastructure, including pricing of congestion. The electricity sector has had cost-reflective and locationally-varying dynamic pricing of wholesale electricity since 1996. As we noted to the CCC, these prices signal congestion to users and operators of the network in real-time, and those signals have also successfully driven investment in and retirement of major generation infrastructure. We consider that the electricity sector's experience can inform development of more advanced forms of pricing for other infrastructure.

We acknowledge, however, that participation in the wholesale market by the demand side has been limited to date. The introduction of the Dispatch Notification product, discussed above, is designed to enable more active demand-side participation.

As discussed above, the Authority is currently reforming pricing of transmission infrastructure and considering options for accelerating distribution pricing reform in order to better coordinate investment and operation of infrastructure in the sector.

Our submission to the CCC covered electricity wholesale market operation in detail, and we would welcome the chance to discuss this with you in more detail.

We will regularly update InfraCom on the progress of our workstreams that relate to its recommendations, and look forward to ongoing dialogue as we work together for the benefit of all New Zealanders.

Ngā mihi

Chief Executive

Appendix A Electricity Authority submission to the Climate Change Commission's draft advice

26 March 2021

[redacted]
Chief Executive
Climate Change Commission

Submitted via online upload

Tēnā koe Jo

Electricity Authority submission on Climate Change Commission's draft advice

We welcome the Climate Change Commission's publication of its draft advice, and appreciate the opportunity to provide you with a submission. Publication of the Commission's draft advice represents a watershed moment for New Zealand, setting out a blueprint for how our country can transition to a low-emissions economy that serves New Zealanders for many generations to come.

The Electricity Authority's primary function is to regulate New Zealand's electricity system and markets, enforcing the rules, and holding industry participants to account through active monitoring and enforcement. Where required, we facilitate the development and enhancement of the markets to ensure their robustness and the delivery of long-term benefits to consumers.

We promote competition in, reliable supply by, and the efficient operation of the electricity industry. We operate the electricity system and markets through a range of contracts with service providers, including Transpower.

We agree with the Commission that the transformation of the energy sector is critical to the transition, and the electricity sector has a significant role to play. Our interest is to ensure the transition happens efficiently, and, critically, that security of supply is maintained as New Zealand's energy system evolves.

The Commission's vision requires the electricity industry to deliver access to "abundant, affordable, and reliable low emissions electricity." This vision aligns well with our own organisational purpose: to enhance New Zealanders' lives, prosperity and environment through electricity. The Authority is willing and able to support the Commission with independent, expert advice relevant to the electricity sector transition. We have the flexibility to support the Commission to address complex questions as they arise.

An energy strategy can set clear direction for New Zealand's transition

The energy sector is complex, supporting and interconnected with every part of New Zealand's economy. The transformation must take place at a rate faster than has been achieved before in New Zealand. As the Commission has noted, there are some significant choices to be made over the coming decades, and the Government has a clear leadership role to play.

The Authority supports the Commission's recommendation for development of an energy strategy. Energy choices need to be made coherently and holistically, viewing the entire system end-to-end from primary supply to consumption – especially now consumers are able to produce their own energy too. The strategy needs to be cognisant of the wide range of different primary fuel sources, including geothermal heat, wind, sun and rain, and the relative security of each of these.

The Commission's draft advice echoes ongoing debate in the industry around some of the key choices that will need to be made in the energy strategy:

- The desired pace of transition, and the role of renewable energy targets at various stages
- The role of the emissions trading scheme (ETS) in facilitating the transition, and clarity of under what circumstances, or in what areas of the system, the ETS may not be sufficient to achieve emissions objectives in a timely manner
- The ongoing role of fossil fuels in the electricity sector (complementing the review of gas supply currently underway), and the importance of maintaining security and reliability through the transition
- Relatedly, how and when decisions are made to retire thermal generation capacity, by whom, and how its place in the electricity system will be taken up by other technologies
- How New Zealand will ensure that network infrastructure and network businesses are able to support consumers' choices to electrify their energy loads and/or develop their own energy generation
- How New Zealand will build the necessary electricity infrastructure (generation, transmission and distribution) at the pace required to support the increased electricity demand, considering:
    - The role and value of private investment in the energy sector, both upstream and downstream, and the importance of investor confidence in driving that investment
    - Whether the policy and regulatory frameworks need to progress from "removing barriers" to "actively promoting" specific technology, investor classes and business models
    - The potential role and impact of direct Government investment in energy infrastructure, either directly, or through incentive mechanisms or funding, and how private and Government investment may be able to operate in tandem
- The role of supporting, adjacent policy in facilitating the transition. For example, how flexibility in existing hydro resources can be maintained or increased, efficient consenting and reconsenting processes, and the flow-on impacts of electrification for other sectors (e.g. roading)
- How to set a clear focus on energy efficiency as a primary means of reducing emissions

These are all significant issues, which have not reached consensus in recent decades. These issues cross-cut a number of agencies' jurisdictions. Development of the energy strategy should

therefore be led and delivered by the Council of Energy Regulators, resourced appropriately, working in concert with the sector's many stakeholders and other, related agencies.

Completion of the energy strategy is urgent. Development should be well underway within the next six months. There are long lead times in energy infrastructure investment, and parties are making decisions right now that will impact the sector for decades to come. The strategy will help to identify the choices required and form a cohesive plan of action for the sector. The strategy will inform the direction and pace of policy and regulatory reform required to enable the sector to evolve as it needs to.

Efficient investment and operation are key drivers of affordability

The Commission's modelling of potential futures for the energy sector aligns with the general consensus view on New Zealand's transition. We agree with the need to maximise electricity usage in the economy, the importance of optimising the use of existing infrastructure, and the consequent need for a significant quantity of new infrastructure – including new renewable generation capacity, and transmission and distribution network infrastructure. This will require a rate of energy infrastructure investment not seen before in this country.

Decision-making around how, when and where this infrastructure will be built is complex. The investment is capital-intensive, often lumpy, and can have significant lead times. Given the importance of electricity to New Zealanders' lives and the economy, outages are extremely costly and maintaining security of supply requires coordination between a large number of parties.

Managing the power system itself requires electricity supply and demand to be balanced over multiple time periods. This is the primary role of the wholesale market. Hour by hour, demand must be met by supply from power stations in order to keep the lights on. Month by month, station operators must plan their generation output to match demand, particularly if they have a finite and uncertain amount of fuel – as is the case with hydro generation stations. And year by year, New Zealand must keep building new power stations to make sure the increasing demand can continue to be met.

In order to keep the system in balance in the long term, New Zealand needs the right infrastructure built at the right times, in the right places. Build too little, and some demand may be unserved, while other demand may have to be met through expensive forms of generation. Build too much, or in the wrong places at the wrong times, and more capital investment costs may need to be recovered than consumers can afford.

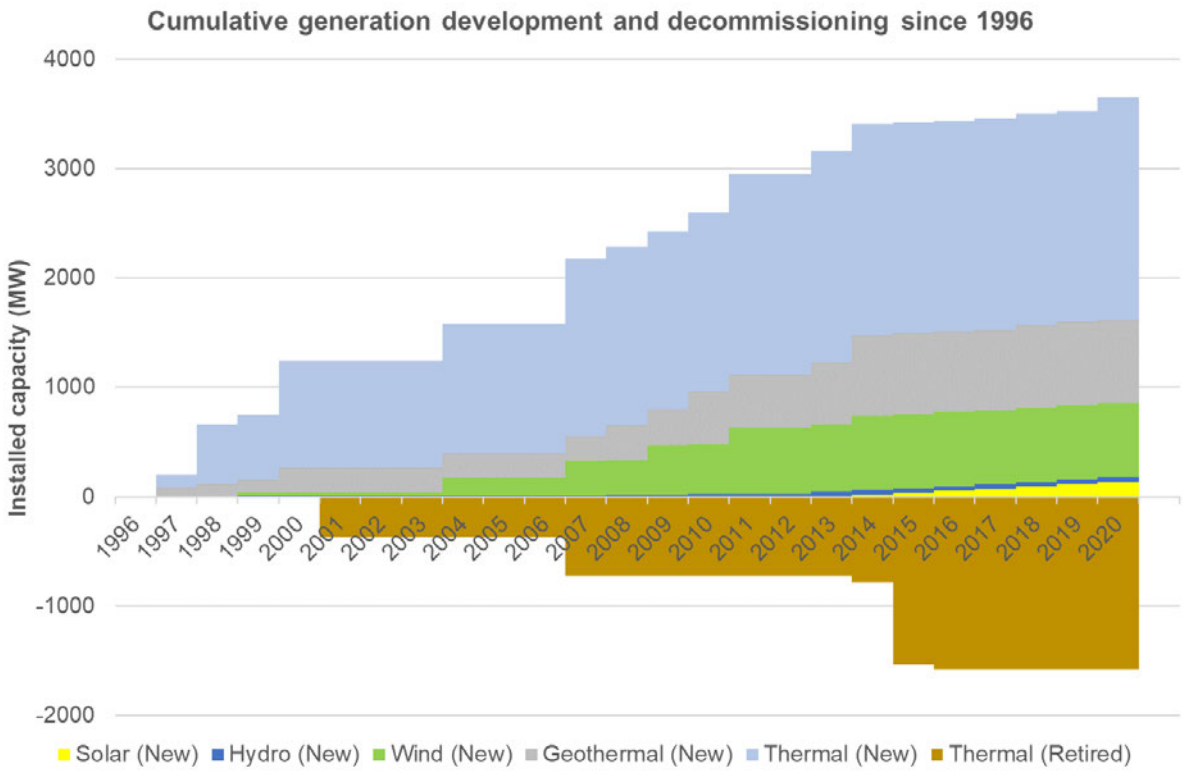
This is a difficult balance to strike, and requires a means of coordinating decision-making of many different parties. This investment must be undertaken efficiently if electricity is to remain affordable through the transition.

Clear signals are critical to determining future investment needs

One of the reasons why the electricity market was established in 1996 was to provide clear and transparent signals of the status of the demand-supply balance over all time periods. Previously, there was no way for consumers and generators to have a clear view of the balance of supply and demand, particularly when hydro levels were low. There was also no transparent means by which requirements for new investment were signalled to potential investors.

Now, the electricity wholesale market has the role of signalling the status of the demand and supply balance, and the value of potential new investment at various times and in various locations. It does this by matching demand and supply at hundreds of locations around New Zealand, in every half hour, every day. Price differentials across time and location help to signal the value of energy from potential new developments. A forward curve for electricity prices into the future gives visibility of the collective view of how demand and supply on the system will evolve over time. Private investors respond to these signals.

While it is not perfect, this model has been very successful. As shown below, around 1600 MW of new renewable generation has been built in New Zealand by investors since the market started, 25 years ago, alongside around 2000 MW of new thermal generation. Around 1500 MW of thermal generation has been retired. Most of the new development (around 3000 MW) occurred in the first 15 years of the market, prior to the decline in load forecasts.



However, the Commission's projection suggests that in the order of 4500 MW of new renewable generation will need to be developed over the next 15 years. This investment must therefore occur at a rate materially faster than the market's first 15 years.

Investors are responding to the decarbonisation challenge

New Zealand has a significant amount of consented new renewable options, and the costs of developing renewable generation, such as solar and wind (and other supporting technologies, such as batteries), have fallen dramatically in the past decade. Since the announcement that the Tiwai smelter will remain operational until the end of 2024, several new generation developments have been confirmed, including Tahaura geothermal (152 MW) and Harapaki wind farm (176 MW), and more are nearing the final stages of investigation (including the 93 MW Mt Cass wind farm). The Waipipi wind farm (133 MW) has just completed commissioning.

Signs are therefore promising that significant new investment will occur quickly, but it is very early days. These investors are clearly comfortable enough with the direction and stability of New Zealand's climate and energy policy to commit hundreds of millions of dollars of capital to the New Zealand electricity sector without any subsidy, but many billions of dollars more investment capital will be required.

As discussed above, the energy strategy must canvas whether there are areas in which the investment challenge may not be met by the private sector under existing settings, and whether changes to these settings – and/or direct intervention by Government – may be required. The Authority is well placed to lead that investigation.

Regardless, the wholesale market will remain a highly effective mechanism for balancing supply and demand in real-time, and for signalling the need for investment in new generation. Key priorities for the Authority are ensuring the market is competitive, and the pricing signals it creates are efficient.

The desired outcomes for the electricity system are too important to be left to chance. The electricity market is a *regulated market*, which we actively monitor and intervene in to ensure that it delivers long-term benefits to consumers. For example, we have a number of ongoing initiatives to improve conduct and information disclosure in the wholesale market, to improve the transparency and visibility of the efficiency of the prices it creates, and to ensure participants' compliance with the rules. Private sector investors must have trust and confidence in the system to support their investment and participation, and also in our performance in holding participants to account.

Signals are also needed to support network investment

Pricing also plays a critical role in ensuring investment in and operation of network infrastructure is efficient. Users of the network – both generation and consumption – need to understand the impact their investment and operating decisions will have on network investment requirements, in order to ensure that the networks do not over-invest in unnecessary infrastructure, paid for by consumers.

The scope for poor outcomes from inefficient network pricing signals is growing, as technologies such as electric vehicles, solar panels and battery storage are becoming more available and affordable. The scale of consumer benefits from more efficient distribution pricing is likely to be significant – previously estimated to be in the billions of dollars for solar panels and electric vehicles alone.

Increasingly, the challenge will be to manage *congestion* on distribution networks – as levels of distributed generation increase and flow patterns change – rather than peak demand. Efficient pricing, and coordinated operation of distributed energy resources (DER, for example demand responsive technology, onsite generation, and batteries), will play a key role in bringing benefits to all parts of the electricity value chain.

Again, the outcomes required of the electricity system are too important to be left to chance, and intervention is required. As with transmission pricing, the Authority is actively pursuing similar objectives in distribution pricing, where reform is required to send the right signals for investment in and operation of DER. In particular, demand response is set to play a significant role in maximising the benefits of existing infrastructure and minimising the need for new infrastructure. As well as promoting more efficient network pricing, we are also providing a low-

cost means for smaller-scale interaction with the wholesale market, through the new Dispatch Notification product under real-timing pricing. One of the key aims of this product is to enable efficient demand response. It is critical that retailers, and the retail market, are able to continue to evolve to support the introduction of new consumer-centric offerings that allow the benefits of new technology to be realised. With low barriers to entry and a high penetration of smart meters, New Zealand is well placed.

In summary, efficient signalling for system operation and investment is critical to ensuring the affordability of electricity through the transition, and for maintaining security of supply. We note the Commission has highlighted in its evidence report the need for "clear and timely price signals" to energy users, and we encourage the Commission to offer more express support for the role of pricing in its final advice.

The transition will only occur if electricity supply is reliable

New Zealanders will only entrust their transport and heating requirements to the electricity system if their supply is reliable[1]. Ensuring reliability is maintained through the transition is therefore critical, and a key priority for us, and will be actively managed.

The Commission's advice articulates the reliance of New Zealand's electricity supply on hydro generation, which can be impacted significantly by time periods of very low inflows. Rolling blackouts were a feature of New Zealand's supply in several decades in the 20th century, and concern over management of dry periods was one of the reasons why the Electricity Authority was established in 2010. Dry sequences have been managed well since, however we acknowledge that perceptions of reliability can easily be undermined.

Currently, the system manages dry periods by generating more electricity from burning fossil fuels, primarily gas and coal. This approach is not aligned with the Government's longer-term ambitions. Indeed, the electricity system is facing a number of risks this winter, due to the combination of low hydro storage levels and uncertain gas supply.

As discussed above, signalling through price is a key role of the wholesale market. There will be periods of relative oversupply in the system, and periods of relative undersupply, lasting months or years. Prices have a critical role in reflecting these imbalances to system users. With the increase in non-dispatchable, intermittent renewables and the retirement of thermal generation, traditional roles in the power system may change materially. Existing hydro may shift from providing a capacity bank to playing more of a balancing role, hour by hour and week by week, with more water able to be stored for release in periods when output from non-dispatchable generation is lower. Appropriate price signals are essential for a successful transition.

This winter, New Zealand is likely to experience a period of higher prices until hydro conditions improve, in order to manage security of supply. High prices in the spot market are what we expect under these conditions, and while these levels are high, they appear broadly commensurate with the level of risk the system is facing. They are also incentivising the sort of actions we expect parties to take to mitigate risk of a future physical shortage. Household consumers are largely insulated from these prices in the short-term by retailers hedging their

[1] In the context of the electricity system, reliability is an umbrella term which describes the system (supported by the wider regulatory regime and market settings) consistently working to generate and transmit electricity to meet consumers' needs. This definition of reliability incorporates concepts of network security – a network's ability to continue to provide service with minimum acceptable service disruption after one or more disturbances.

exposure. Larger industrial consumers who are exposed to this price risk have risk management tools available to them to insulate themselves from price volatility, if they choose to do so.

Assuming the demand situation does not change materially, the current levels of volatility in the market may continue for a prolonged period, until the new generation developments discussed above begin to come online. As mentioned above, these developments will reduce reliance on fossil fuels and enable more hydro power to be conserved for when it is absolutely needed. While a greater proportion of non-dispatchable, intermittent renewables may lead to greater levels of intra-month price volatility, this may be offset by increased flexibility in the demand-side of the system. New investment in renewables, and greater demand-side flexibility, will mitigate the impact of uncertainty in gas supplies.

In short, the transition may not be stable, and there will be periods in which the system is out of balance. The Commission should note the potential for significant variability around the wholesale energy prices it predicts. Volatility in and of itself is not a problem, provided it is providing accurate, efficient and actionable signals. The Authority ensures mechanisms are available for users to manage the risks of this volatility (such as financial hedge contracts), and to continue to prioritise fuel choices (thereby avoiding scarcity events). We will ensure that the set of mechanisms available evolves and remains fit for purpose as the risks themselves evolve. Again, security of supply will need to be actively managed through these periods.

Initiatives that accelerate the transition of the electricity system, beyond its natural rate, may impact on how security and reliability risks are currently managed, and may have unintended consequences. Early consideration of the existing competition, reliability, and efficiency objectives of the electricity sector will support the success of those initiatives in achieving climate change objectives. The energy strategy will therefore need to be clear whether the transition should occur in a more rapid and/or less disruptive way than might otherwise be the case, and whether there is a role for Government intervention to enable that.

Our work is well aligned with the Commission's recommendations

Appended to this letter is a summary of our views on the Commission's recommendations relevant to heat, industry and power, and the work we are already doing to address each of them.

The Authority supports the Commission's recommendations to develop a national energy strategy, and to ensure the distribution sector is able to play a key enabling role in the transition to low-emissions energy. Ensuring efficient investment in and operation of DER, for the benefit of all New Zealanders (not just those who own DER), is a key focus for the Authority.

We look forward to ongoing dialogue with the Commission on the progress of each of these initiatives.

We will support the Commission in its analysis

The Authority is willing and able to support the Commission with independent, expert advice relevant to the electricity sector transition. We have the flexibility to support the Commission to address complex questions as they arise.

We offer to support the Commission in refining its analysis and advice, and consideration of stakeholders' submissions. We are happy to assist Commission staff with any further analysis they may choose to undertake.

We will regularly update the Commission on the progress of our workstreams that relate to its recommendations, and look forward to ongoing dialogue as we work together for the benefit of all New Zealanders.

Nga mihi

Chief Executive

Appendix A Alignment of the Authority's current activity with the Commission's recommendations

In this appendix we focus our feedback on the Commission's Necessary action 5 – *Maximise the use of electricity as a low emissions fuel*. The Commission recommends that in the first budget period, the Government takes steps to ensure a low-emissions, reliable and affordable electricity system to support electrifying transport and industry, through progress on six specific recommendations. These recommendations are set out in the table below.

We note that our work also has relevance to other recommendations. For example, our work on distribution pricing and standards development will have a positive benefit for investment in infrastructure to support the transition to low-emissions transport (time-critical necessary action 2d).

Commission draft recommendation	**Authority comment**	**Relevant Authority work**
a. Under the framework of a national energy strategy, set a date by which coal electricity generation assets must be retired.	We agree with the Commission that the timing of decommissioning of a small number relatively large assets, on both the demand and supply sides of the energy system, creates uncertainty for decision-making in investment and reinvestment. These assets include the Huntly Rankine units, the Tiwai aluminium smelter and Methanex's production facilities. As noted in our cover letter, security of supply must be maintained through the transition. Consideration should also be given to ensuring there are no barriers to energy being allocated to the highest-value demands during any periods of shortage in the interim. Our preference would be to rely on the signals provided by the ETS as the primary influence on decision-making. However, we agree that the value of providing more certainty for investors is worth exploring. Care needs to be taken in not unnecessarily restricting the option sets available to the owners of these assets.	The Authority is not undertaking any work currently relating to mandated closure requirements.

Commission draft recommendation	Authority comment	Relevant Authority work
	For example, rather than specify closure, the energy strategy could specify emissions limits on generation assets, which decrease over time. This could allow them to convert to lower-emissions fuels, such as biofuels or gas, if it is efficient to do so. Again, this signal should also be provided by the ETS. We note with respect to retirement of coal generation assets, Genesis Energy has already stated its intention to end coal use for generation by 2030, although it notes gas would continue to have a back-up role. The ability to retire these units earlier will depend on the future of the Tiwai smelter and the extent of investment in other (renewable) generation, and potentially storage, that displaces reliance on these units and enhances the ability of hydro generation to operate more flexibly. The Authority will continue to engage with other policy agencies to ensure ongoing security of supply in this transition.	
b. Under the framework of a national energy strategy, decide how to progress solutions to the dry year problem, when this should happen, and at what cost.	With respect to dry year security, the Authority notes the Commission's comment (page 112) that: "Arriving at 100% renewable electricity is the desired end point, but the timing and sequencing of the transition is important". This is consistent with views of the Authority. Accordingly, the Authority supports the development a long-term national energy strategy that provides clear objectives and a predictable pathway towards low-emission fuels, and the infrastructure to support delivery	The Authority will support MBIE in its NZ Battery project, as and when required, including analysis of potential commercial solutions to dry-year risk that may complement direct investment in physical solutions.

Commission draft recommendation	Authority comment	Relevant Authority work
	(*Time-critical necessary action 3a – Target 60% renewable energy no later than 2035*). Development of an energy strategy would reduce uncertainty about the transition and support the critical and substantial investment needed for the transition. A key focus for the Authority in the development of such a strategy would be maintenance of security of supply, and the Authority would work with other agencies to support this. While we believe that dry years are currently managed well by the market, we acknowledge that the reliance on high-emitting thermal fuels to provide dry-year cover is not aligned with the Government's longer-term ambitions. There are a wide range of potential solutions to future dry-year risk, in place of thermal generation. These may involve new physical solutions, such as pumped hydro, or new commercial models, such as demand response, or a combination thereof. New industries, such as hydrogen production, may be able to provide sufficient responsiveness as to alleviate concerns around dry-year risk. We acknowledge that MBIE's NZ Battery Project will canvas the range of potential solutions over the coming two years.	
c. Introduce measures, such as a disclosure	As discussed above, uncertainty around the timing of decommissioning of several large assets on the	The Authority has work underway to improve wholesale market information disclosure. In January 2021 the Authority decided to amend the Electricity Industry

Commission draft recommendation	Authority comment	Relevant Authority work
regime, to reduce wholesale electricity market uncertainty over Emissions Budgets 1 and 2, to encourage investment in new renewable generation.	electricity system creates uncertainty over the potential returns for investors in new generation. Rules on wholesale market information disclosure already exist, and are set out in the Electricity Industry Participation Code 2010 (the Code). In general, the rules require participants to disclose information that would be expected to have a material impact on prices, including future prices. The existing disclosure rules already address, in part, the Commission's recommendation for a requirement that large market participants (demand or supply) must give sufficient notice of market exits when closure of a plant is not forced. In particular, the Authority's Guidelines for information disclosure give the following as an example of disclosure information: *6.27 Under normal circumstances, the Authority considers that the following could reasonably be expected to have a material impact on prices in the relevant markets and therefore be disclosure information.* *a) Major investment and dis-investment decisions – examples include a decision to build major new generation or transmission assets, mothball or decommission major existing assets, or undertake major upgrade or refurbishment of existing assets. A large electricity user scaling its production facilities up or down in a manner that would materially*	Participation Code 2010 (the Code) to improve the availability of thermal fuel information. This will help build confidence for participants in the market by allowing them to better manage risk by giving them more visibility of market activities, which will ultimately benefit consumers in the long term through more efficient prices. The amended Code provisions will be in force from 1 April 2021. The Authority will consider what additional disclosure requirements or measures are required to reduce regulatory or policy uncertainty, following receipt of the Commission's final advice.

Commission draft recommendation	Authority comment	Relevant Authority work
	impact electricity demand would also be an example. However, these rules do not require entities to give sufficient notice in advance of exits; rather, they require disclosure of decisions once they have been made. We note for completeness that listed entities also need to comply with their continuous disclosure obligations.	
d. Assess whether electricity distributors are equipped, resourced and incentivised to innovate and support the adoption on their networks of new technologies, platforms and business models, including the successful integration of EVs.	Distributors play an important role in the sector as their networks provide the platform on which competitive electricity services are traded. Providing this platform comes at a cost. Distribution charges make up a material and currently uncontested portion of the power bill: about 27% of the average household's bill. Distributors collected about $1.9 billion in non-transmission lines charges in 2019 with the household contribution about $1 billion annually. The 29 distributors are not uniform. The four largest account for half of the revenue, and the most geographically spread-out network has 10 times the length of lines per customer as the densest one. Four lines companies have fewer than 10,000 customers while the largest has over 560,000. The Authority is aware the level of capability differs significantly across distributors, and that companies are taking different courses with respect to asset ownership preference, investment in and operation of DERs, and how they engage with other industry participants.	The Authority is actively considering how to accelerate the transition to more efficient distribution pricing. Our most recent assessment of distributors' efforts to reform distribution tariffs (released in February 2021) highlighted the slow overall pace of progress in pricing reform by distributors. While some distributors have made significant changes, the published plans of distributors for further pricing reform are generally incremental at best, vague, or in some cases, non-existent. The Authority is prioritising work on ensuring the distribution sector has the capability and the capacity to support the electrification of the economy. This will build on other work including: • the Innovation and Participation Advisory Group (IPAG) 2019 advice to the Authority Board on 'equal access' to networks • the new Code requirement for a Default Distribution Agreement, which promotes lower-cost and competitively-neutral access to distribution

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	The Commission comments (page 113) that the capacity and capability of electricity distribution businesses will be an important consideration to delivering the services needed to underpin electrifying the vehicle fleet and industry. We agree. In line with this advice, the Authority is considering how best to promote market development in the distribution sector to better support the transition to a low-emissions future. This work is at varying stages of progress, and the Authority is engaging closing with other agencies, including the Ministry of Business, Innovation and Employment (MBIE) and the Commerce Commission. Finally, the Commission could note in its advice that it is also critical that the services provided to consumers by the competitive parts of the sector evolve to meet changing consumer needs. It is critical that system settings enable innovation to occur, and that existing participants are disciplined by strong competitive pressure to continue to deliver the services that their customers want and need. This is a strong area of focus for the Authority.	networks, and improves the ability of distributors to access data about activity on their network. Our Open Networks programme currently includes: • Amending the Code to facilitate the ability of distribution networks to have small-scale distributed generation (such as rooftop solar photovoltaic, in-home batteries, small wind turbines and micro hydro) connect to, operate on, and export from their networks without causing power-quality issues ('hosting capacity') • Working with Standards New Zealand and EECA on the development of standards for in-home and commercial/industrial electric vehicle charging and medium-temperature hot-water heat pumps. This is critical to supporting security as the transport fleet is electrified and process heat transitions away from fossil fuels. The Authority will also continue liaising with the Commerce Commission on matters of common interest, such as understanding the risks and benefits associated with the supply of emerging contestable electricity services by electricity distributors. We note that the extent of such collaboration will likely depend on the outcome of the Commission's proposal for increased funding to improve its work in regulated sectors, including electricity, which is a proposal we support.

Commission draft recommendation	Authority comment	Relevant Authority work
e. Enable more independent generation and distributed generation, especially for remote and rural Māori communities, and ensure access to capital for this purpose	Thriving competition in the wholesale market is critical to the transition to low-emissions energy, and we recognise the competitive pressure that distributed generation can place on grid-connected generation. While we do not favour any particular technologies or ownership models, we want to reduce barriers to entry and expansion for independent generators, for all sizes of investment up to grid scale, to ensure they can compete on a level playing field with established participants. Decisions on the merits of private versus public funding for generation development should be covered in the energy strategy. It is worth noting the quality of New Zealand's natural resources and existing transmission and distribution infrastructure. In some situations, distributed (local) generation can deliver energy to consumers at a lower cost than the combination of remote generation and transmission, especially when new transmission investment may be required. In other situations, lower-cost energy can be produced by remote generation, at scale, transported via the transmission network. Decision-making on these trade-offs is complex. Ensuring prices and price signals are efficient is critical to enabling efficient investment in generation, regardless of the scale, location, connection type and technology. Of particular relevance to distributed generation will be cost-reflective pricing on distribution networks, as discussed above.	The Authority has several initiatives relevant to this recommendation, including: • Open Networks hosting capacity (see explanation above under response to Necessary action 5d) • Work on accelerating the application of more efficient distribution pricing (see explanation above under response to Necessary action 5d) • Real time pricing and Dispatch Notification projects (see explanation below under response to Necessary action 5f).

Commission draft recommendation	Authority comment	Relevant Authority work
	We note that MBIE consulted on this issue in their *Accelerating renewable energy and energy efficiency* discussion document in December 2019. We support the subsequent work recommended to reduce barriers such as reviewing the National Policy Statement for Renewable Electricity Generation.	
f. Monitor and review to ensure electricity remains affordable and accessible, and measures are in place to keep system costs down, such as demand response management.	Ensuring electricity remains as affordable as possible is a key priority for us, which we will achieve through promoting efficient investment in and operation of all parts of the electricity industry. We acknowledge the untapped potential of demand-side flexibility in the industry. Ensuring this flexibility can be harnessed for the value of all New Zealanders will be a priority for us over the next four years. As discussed in the right-hand column, we already have a number of initiatives in train to increase the ability for responsive demand to participate in the electricity market. In particular, we recommend the Commission make reference to the Dispatch Notification product in the development of real-time pricing, which is intended to lower the costs of participation in the wholesale electricity market by demand response and other DER. We are happy to provide you with more information on this initiative.	The Electricity Price Review (EPR) noted that New Zealand's electricity industry works well in many respects, but consumers would benefit from stronger competition, fairer and more efficient pricing, and more openness to new technologies. The Authority is progressing responses to six EPR recommendations to increase retail competition and four to reinforce wholesale market competition. These recommendations include measures for monitoring the efficiency of prices in the wholesale electricity market. The EPR found that the electricity regulatory regime generally works well in the current environment, but noted that opportunities and challenges in the sector increasingly cross traditional boundaries. In particular, achieving a low-emissions economy will mean increased demand for electricity with more renewable generation, and widespread use of electric vehicles, solar panels and battery technology. In relation to demand-side response: • We are undertaking work to improve wholesale electricity market settings to enable more demand response/flexibility. This includes the real-time

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		pricing project to make wholesale electricity prices more reflective of demand in real time, and the Dispatch Notification product to lower the costs of participation in the wholesale electricity market. • We are promoting changes to transmission pricing and distribution pricing, which focus on optimising the use of the existing network and promoting more efficient investment in expansion of the network, and in generation and load. These changes are critical for ensuring the transition to greater use of electricity occurs in a way that maximises the capacity available, and allowing for necessary expansion while keeping the cost affordable • The IPAG is undertaking a review of Transpower's initial experiences with its Demand Response programme[2]. The scope of the review also covers the broader flexibility mechanisms currently available in New Zealand.

[2] Transpower's revenue allowance for its second Regulatory Control Period included $8 million for a demand response programme as a means of deferring transmission investment.