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Consultation Paper - The future operation of New Zealand's power system

We appreciate the opportunity to respond to the Electricity Authority's (the Authority's) consultation paper 'The future operation of New Zealand's power system'¹ which is seeking to understand the key challenges and opportunities for future power system operation in New Zealand. In this submission we first set out a summary of our key points, and then respond to the consultation questions. Nothing in this submission is confidential.

Consumer participation in the energy transition

We support electricity system developments which enable consumer participation in the energy transition. PwC's global insights reveal increasing focus on demand side initiatives in overseas energy systems, contributing to all three objectives of the energy trilemma, as illustrated overleaf. Recent PwC research suggests that demand side intervention can achieve up to a third less energy intensity without a reduction in corresponding economic output.² CER³ and DER⁴ participation is one of the value drivers of this demand side opportunity.

In New Zealand, we need an electricity system which helps users benefit from CER and DER by monetising their energy assets. The value of these resources is in deferred network and renewable generation investment, reduced thermal generation and exposure to international carbon credit offset costs, and improved resilience and security of supply.

There is a wealth of information already available from within New Zealand and overseas about the benefits of a more flexible electricity system, which enables demand side response and consumer participation. There are working group reports, submissions, trials, and international experience to draw on. The consultation paper draws together some of this information and provides an international perspective.

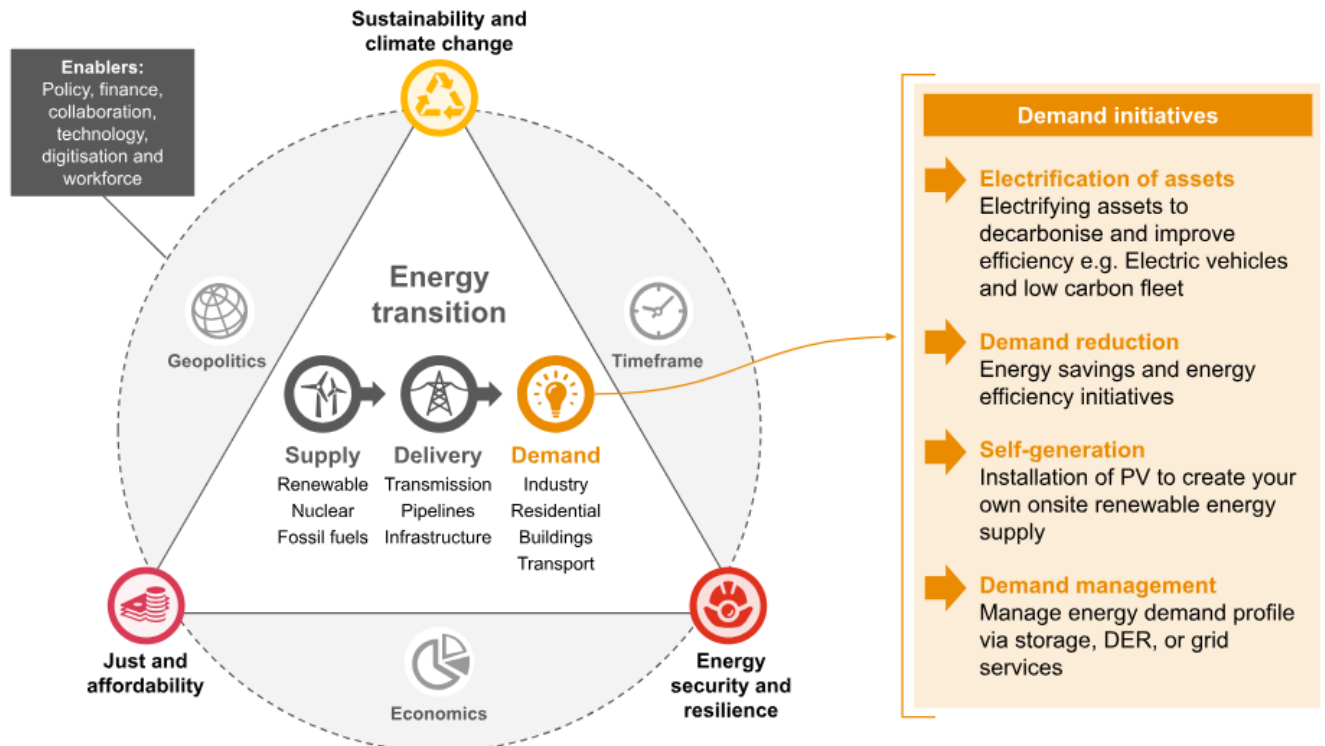
¹ Electricity Authority, The future operation of New Zealand's power system, Consultation Paper, 15 February 2024

² <https://www.pwc.com/gx/en/issues/esg/the-energy-transition/transforming-energy-demand>

³ Customer energy resources

⁴ Distributed energy resources

Why should we be talking about energy demand?



Source: World Economic Forum, PwC Analysis

The **energy transition** creates immense and growing tensions between **security, affordability** and **sustainability**.

To date, the majority of debate and action has been focused on governments and energy companies driving changes in **energy supply**. This has resulted in remarkable changes in the energy system, with rapid increases in emissions-free and decentralised electricity generation.

However, the trajectory of the energy transition remains **off-track** compared to climate and development goals, hindered by issues such as **slow permitting** and **access to finance**. Therefore, while action on energy supply remain crucial, it is not the only solution.

It is vital to address **energy demand** alongside supply. Reducing the energy intensity of current activity and future growth.

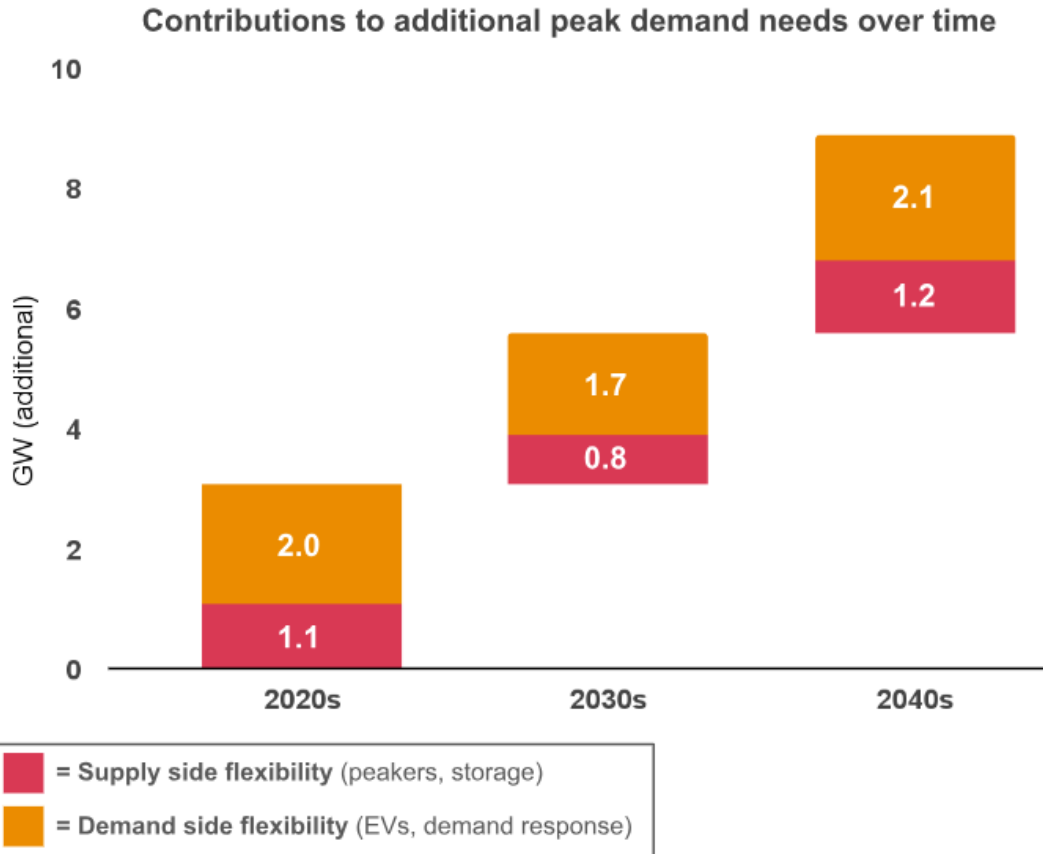
What is evident is that there is a significant opportunity for New Zealand from a more flexible electricity system.

The Future is Electric report⁵ highlights the role of demand side flexibility (via EVs⁶ and demand response) alongside supply side flexibility (peakers and storage) in helping to meet expected increases in New Zealand's peak demand. As illustrated overleaf, it is estimated that demand side flexibility will contribute almost twice as much as supply side flexibility in contributing to meeting additional peak demand by 2050.⁷

⁵ Boston Consulting Group, The Future is Electric, A Decarbonisation Roadmap for New Zealand's Electricity Sector, November 2022

⁶ Electric vehicles

⁷ BCG, Additional peak demand needs, page 14



Source: BCG, PwC Analysis

In 2019, a Transpower commissioned report⁸ estimated \$7b of net present benefit from CER. However, until we create the right system settings, these consumer benefits are lost. The opportunity for today's consumers is already significant, for example:

- Although the EV fleet is < 3% of New Zealand's total car fleet, there are approximately 100,000 EVs and PHEVs⁹ which could participate now.
- There have been over 2.2 million heat pumps sold in New Zealand over the past 15 years, which is more than our total number of households. Since 2019, all heat pumps sold have needed to have demand response capability.
- Residential flexible demand of 2-3kW per household (representing hot water load) could increase to up to 15kW with EVs and heat pumps.

The Authority should act now

We commend the Authority for undertaking this consultation and agree with the consultation paper which states that the Authority is '*well placed to facilitate a review of future power system operation, working closely with and alongside industry stakeholders*' including consumers.¹⁰ However, we need to accelerate our planning and catch up to the market development which

⁸ Sapere, Distributed Energy Resources, Transpower, 2021

⁹ Plug-in hybrid electric vehicles

¹⁰ Consultation paper, paragraphs 2.16 and 1.6

are already underway in other jurisdictions, otherwise further delay will continue to cost consumers.

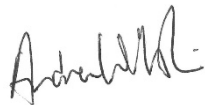
We agree with the consultation paper which states that the Authority needs to '*identify challenges and opportunities that may arise due to the energy transition, and identify what regulatory arrangements administered by the Authority would address challenges or enhance opportunities*'.¹¹ However, we encourage the Authority to extend its role beyond that contemplated in the consultation paper. The Authority is best placed to lead the coordinated development and implementation of a more flexible electricity system, drawing on international experience and the research to date in New Zealand. A collaborative approach to electricity system design is appropriate given the segregated structure of the New Zealand electricity sector, and the large number of participants involved. Ultimately the Authority will need to navigate divergent views and implement changes which are consistent with the long term interests of New Zealand's electricity consumers.

We encourage the Authority to drive this market reform, and because further delay ultimately costs electricity consumers, we suggest targeting the integration of active consumer participation in the national electricity market by 2028, through demand response, smart EV charging and CER / DER. This date provides a three year preparatory period for the industry to resolve market design issues including signaling of constraints, price discovery and clearing, and integration of signals between networks and market participants.

There will be opportunity to further refine the market over time as new products, services, participants, and technologies emerge. In addition, further competition and innovation can be expected to emerge once initial market settings and standards are determined.

Closing

We thank you for the opportunity to provide a submission. Please contact either of the undersigned if you have any questions about this submission.



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¹¹ Consultation paper, paragraph 2.12

Responses to questions

Questions	Comments
<p>Q.1. Do you consider section 3 to be an accurate summary of the existing arrangements for power system operation in New Zealand? Please give reasons if you do not agree.</p>	<p>Yes.</p>
<p>Q.2. Do you agree that we have captured the key drivers of change in New Zealand's power system operation? Please give reasons if you do not agree.</p>	<p>Yes.</p>
<p>Q.3. Do you have any feedback on our description of each key driver?</p>	<p>No.</p>
<p>Q.4. What do you consider will be the most helpful to increase coordination in system operation? Please provide reasons for your answer.</p>	<p>The Authority leading industry collaboration to integrate active consumer participation in the national electricity market by 2028, through demand response, smart EV charging and CER / DER.</p> <p>The issues identified in the consultation paper must be resolved, for example:</p> <ul style="list-style-type: none"> ● Improved DER visibility and connectivity (with common standards or protocols) ● Coordination of transmission and distribution system operations
<p>Q.5. Looking at overseas jurisdictions, what developments in future system operation are relevant and useful for New Zealand? Please provide reasons for your answer.</p>	<p>Coordination between transmission and distribution system operations, and collaboration between distributors, particularly within regions.</p> <p>This coordination will be necessary to maximise the consumer benefits of demand side flexibility.</p>
<p>Q.6. Do you consider existing power system obligations are compatible with the uptake of DER and IBR-based generation? Please provide reasons for your answer</p>	<p>The issues identified in the consultation paper must be resolved, for example:</p> <ul style="list-style-type: none"> ● Maintaining power quality ● Protecting and sharing information ● Code amendments <p>Integrating consumer participation to the national electricity market will require signaling of constraints, price discovery and clearing, and integration of signals between networks and market participants.</p>

<p>Q.7. Do you consider we need an increased level of coordination of network planning, investment, and operations across the New Zealand power system?</p>	<p>Currently Transpower and distributors must publish planning information and provide annual updates. Much of the quantitative data (for a ten year planning period) is provided in template format for ease of reference and collation.</p> <p>At the distribution level we support a regional approach to planning and operations to enable scale, capability and optimisation of investment and programme delivery. This is consistent with our publication 'Building Prosperity through the Energy Transition'¹² which identified regional collaboration as essential to developing the required local capability and capacity to support the energy transition across all New Zealand.</p>
<p>Q.8. Do you think there are significant conflicts of interests for industry participants with concurrent roles in network ownership, network operation and network planning? Please provide reasons for your answer</p>	<p>We understand that there are safeguards in place to identify, monitor, and mitigate potential or perceived conflicts of interest for industry participants through the Code and Part 4 regulation.</p> <p>We consider that the structure and scale of the New Zealand electricity sector supports a collaborative approach to market design, with appropriate regulatory oversight and input from industry organisations. Market design needs to come first, then the appropriate Code amendments can be made.</p> <p>We encourage the Authority to take a lead role in this market design, in particular navigating divergent views in the long term interests of New Zealand's electricity consumers.</p> <p>Further competition and innovation can be expected to emerge once initial market settings and standards are determined. If necessary, the market settings and/or regulations can be refined over time to respond to changing roles and market participation.</p>
<p>Q.9. Do you have any further views on whether this is a good time for the Authority to assess future system operation in New Zealand, and whether there are other challenges or opportunities that we have not covered adequately in this paper? Please provide reasons for your answer.</p>	<p>This is a critical time for New Zealand's power system, and we encourage the Authority to lead and work with industry participants to establish the market settings for widespread consumer participation through CER/DER.</p> <p>We encourage the Authority to drive this market reform, and because further delay ultimately costs electricity consumers, we suggest targeting the integration of active consumer participation in the national electricity market by 2028, through demand response, smart EV</p>

¹² PwC, Building prosperity through the energy transition, 1 December 2022, page 14

charging and CER / DER.

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