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Electricity Authority
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Via: operationsconsult@ea.govt.nz

Tēnā koutou

**Consultation Paper – Potential solutions for peak electricity capacity issues**

WEL Networks (WEL) appreciates the opportunity to provide feedback on the Electricity Authority's (the Authority) Consultation Paper – Potential solutions for peak electricity capacity issues (the consultation).

WEL is New Zealand's sixth largest electricity distribution company and is 100% owned by our community through our sole shareholder WEL Energy Trust. Our guiding purpose is to enable our communities to thrive, and we work to ensure that our customers have access to reliable, affordable and environmentally sustainable energy.

We are encouraged by the Authority's consideration of options to address the peak coordination issue over the short and medium-term, particularly in relation to financial incentives to provide flexibility and Battery Energy Storage System (BESS) participation in the wholesale market.

While we have provided more fulsome answers to the questions raised by the Authority in Appendix 1, we wish to reiterate our support for the development of an integrated standby ancillary service long-term management of capacity risk.

Should you require clarification on any part of this submission please do not hesitate to contact me.

Ngā mihi nui

David Wiles

**Revenue and Regulatory Manager**

## Appendix 1: WEL Network's response to the Authority's questions

| Question | Response |
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| Q1: Do you agree with the principle that the winter capacity margin should be based on the trade-off between the cost of the hours of reserve or energy shortfall and the cost of the peaking generation needed to mitigate it? Do you have any other suggestions on factors the Authority should consider and why? | No comment. |
| Q2: Do you agree with our assessment of the incentives for demand response? If not, what is your view? Are there other criteria that the Authority should consider? | WEL agree with the assessment i.e.<br>• There is very little incentive for industrial demand to respond to spot prices as they have little, or no, exposure to the wholesale Spot Market through hedging. This also means they have no incentive to participant in dispatch demand in its present form.<br>• Aggregators of demand have no ability to capture the wholesale spot price. Without payment from another source, they also have no incentive to participant in dispatchable demand. |
| Q3: Other than financial incentives, what are the other barriers to entry for demand response participation in the wholesale market that you have identified? | Slow response long duration demand response often requires a notice period to be able to shut down (e.g. the NZAS contract requires seven days). This lends itself to a capacity type market where day ahead or week ahead selection is used to allow participants to prepare themselves for dispatch.<br>Demand cannot be partially dispatched easily; it tends to be all or nothing. Generally, reduced demand will need to be off for a fixed period. Hence, it works best with an operational envelope of x MW for Y length of time. |
| Q4: Do you agree that the Authority should focus its resources on identifying and lowering barriers for BESS and demand side flexibility to participate in the wholesale and ancillary services markets? If so, where do you think the Authority should focus first? | Yes, there needs to be a review Part 13 to ensure the Code is better aligned to the new technology being connected. Offering BESS resource and access to the frequency response market are clearly in need of review.<br><br>WEL would encourage the Authority to also review the payment structure for demand-based flexibility services within the market. |
| Q5: Do you agree that any solutions should satisfy these principles? If not, what is your view and why? Are there other principles that the Authority should consider? | No comment. |

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| Q6: Do you agree that a standard product for financial 'super peak' hedges is required? | Yes, it is required by the market to manage peak exposure. Additionally, we believe that mandatory market-making is required for these products (as it should be for the current peak product).<br>Such a product would help generation-based flexibility service to monetise their ability to manage peak risk.<br>It would be of no use to an aggregator, or any other demand-based provider of flexibility services, via the present dispatchable demand rules. |
| Q7: What factors do you think we should consider in the design of such a product? | No comment. |
| Q8: Do you agree with our assessment of the risk for the medium to long term? | WEL see little risk in pursuing an integrated ancillary service for demand flexibility. |
| Q9: Do you think it would be beneficial to create a new integrated standby ancillary service? What is your view and why? | Yes. This new service will be required as demand flexibility will need to be integrated into the spot market. |
| Q10: How should the costs for a standby ancillary service be allocated? | No comment. |
| Q11: How should the residual requirement be set? Should it be an operational setting or dynamically calculated? | Initially, it should be an operational setting and could be moved to a more dynamic solution if it is shown that change is desirable. |
| Q12: How should deficit (scarcity) standby residual be priced in relation to scarcity energy and scarcity reserve prices? | No comment. |
| Q13: Do you agree with our assessment of the issues associated with procuring additional resource out of market? If not, what is your view and why? | While there is risk that off market contracts can distort market behaviour, WEL does believe they have a place while the Authority is trying to learn how these products can be procured and dispatched and what are the cost to the market for these services.<br>An annual contract allows for the learning from the last contract round to be incorporated into the next without needing to change the code.<br>This iterative process allow for the fine tuning of the product before investment in the market system is started, reducing the uncertainties and therefore costs of the project. |
| Q14: Do you think it would be beneficial to create an out-of-market tender for emergency | Yes, we believe this would be a very good starting point for this journey of discovery. |

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| demand response? If not, what is your view and why? | |
| Q15: Do you think it would be beneficial to provide payments to resource providers for any uncleared generation and/or dispatchable demand? If not, what is your view and why? | WEL is more comfortable with availability payments for participants in an ancillary service than payments to participants to encourage them to offer their full capacity into the spot market.<br><br>Generators already have a strong incentive to offer any uncleared energy at prices above the clearing price to manage their exposure to the uncapped spot price. If demand was paid the final price the same as generation, then they also would have the same strong incentive to manage risk. |
| Q16: What do you consider to be an appropriate scaling factor to determine the price for residual and why? | No comment. |
| Q17: What is your view on the factors the Authority should consider when valuing the costs associated with a standby ancillary service? | This is highly dependent on the design of the ancillary service. |
| Q18: What other options should be considered to better manage residual supply risk for winter 2024? | No comment. |
| Q19: Do you have information on any other international standby ancillary services and their positive impacts? If yes, please share your information. | Please see Appendix 2. |

**Appendix 2: International observations**

## Australia

Renewables, especially rooftop solar, utility solar and wind have made huge gains in several States.

AEMO has committed to the demand-side, especially in ancillary services and in the FCAS market. Large industrial loads are participating for the first time to compete with the generators.

ARENA has helped with grant funding of several advanced demand response and flexibility projects especially in NSW and Victoria. Many large industrial and commercial portfolios have been built. Enel X (formerly EnerNOC) is one of several aggregators contracted to build this flexibility capability which can be dispatched by AEMO.

The momentum to use ancillary services is gaining traction as more renewable generation gets added to the system.

## UK

The UK made a commitment to flexibility during the smart grid work 5 to 10 years ago. ENA (UK) set the six steps for delivering flexibility services in 2019. All the DNOs and National Grid including the ESO were involved. ENA (UK) was supportive in setting standards and definitions for a DFS using the Sustain, Secure, Dynamic and Restore definitions for both network and grid operators, viz:

### UK Flexibility Definition

| Active Power Service | Definition |
|---|---|
| **Sustain** | The Network Operator procures, ahead of time, a pre-agreed change in input or output over a defined time period to prevent a network going beyond its firm capacity. |
| **Secure** | The Network Operator procures, ahead of time, the ability to access a pre-agreed change in Service Provider input or output based on network conditions close to real-time. |
| **Dynamic** | The Network Operator procures, ahead of time, the ability of a Service Provider to deliver an agreed change in output following a network abnormality. |
| **Restore** | Following a loss of supply, the Network Operator instructs a provider to either remain off supply, or to reconnect with lower demand, or to reconnect and supply generation to support increased and faster load restoration under depleted network conditions. |

UK Flexibility Service

| | Sustain | Secure | Dynamic | Restore |
|---|---|---|---|---|
| **Use Case** | **Scheduled** | **Pre fault** | **Post fault** | **Post fault network restoration** |
| Availability Payment | Yes, for scheduled availability pre agreed within contract | Yes, arming payment for availability at week ahead | Yes, arming payment for availability at week ahead | No |
| Utilisation Payment | Yes | Yes | Yes | Yes |
| Availability Declarations | Week ahead by midnight every Wed for the following week | Week ahead by midnight every Wed for the following week | Week ahead by midnight every Wed for the following week | Week ahead by midnight every Wed for the following week |
| Availability Acceptance | Week ahead. By midday every Thurs for the following week | Week ahead. By midday every Thurs for the following week | Week ahead. By midday every Thurs for the following week | Week ahead. By midday every Thurs for the following week |
| Dispatch Notice | Fixed within contract. Sent 15 mins ahead of requirements | Fixed ahead on acceptance of availability and notice sent 15 mins ahead of requirements | Notice sent 15 mins ahead of requirements | Notice sent 15 mins ahead of requirements |

These definitions are just as valid for the NZ's Electricity market, WEL would think that the:

- Secure service is coved by dispatchable demand,
- And the Dynamic service is Instantaneous Reserves and Frequency Keeping market.

This leaves two markets where flexibility service would be of value in New Zealand, the

- Sustain service, and
- Restore service.

An integrated ancillary service could dispatch the Sustain service pre-event and the restore service post event.

The ESO as part of National Grid has progressively introduced new ancillary services to meet the changing challenges in the electricity market with more intermittent renewables coming into the system to enhance the country's energy security. Ofgem has been supportive and released its own flexibility strategy.

Networks or the DNOs have been using the Piclo flex platform to bring to market flexibility solutions to help with network constraints. The use of this open-sourced platform shows what is possible it is creating new flexibility markets. According to Piclo, they have hundreds of active service providers with over 60,000 assets and 19,000MW on the platform.

The recently launched Ofgem DFS was primarily to reduce balancing costs which had become expensive due to increasing constraints for new generation. Ofgem wanted to introduce competition to the generators. DFS was designed as a range of tools to engage industry to bring out those loads that were not accessible in real time to the

ESO and to start residential work with the roll-out of smart metering. During the 2022/23 winter, over 1.6 million households and 31 providers actively participated. This is a significant achievement and showed a remarkable level of flexibility. As well as meeting its primary role in risk mitigation to the ESO it demonstrated that large scale flexibility can be achieved but more importantly it built momentum for future flexibility work. The ESO and Ofgem are encouraged.

Most recently, the National Energy System Operator (NESO) has been announced to be the strategic integrator or system architect. Their role is to oversee the whole of system spatial plan, work with regional planners and local bodies on net-zero projects but more importantly in the context here, be the market facilitator for future flexibility services. The UK is again leading the way with this regulatory way forward.

## Norway

Norway leads Europe on top of the league table for being "Energy Transition ready". However, the dominance of flexible hydro with plenty of storage limits the market opportunities for demand flexibility. EV penetration is high at 15% of the fleet (2022 data) and there no policy barriers for V2G technologies appearing.

This hasn't stopped a pilot project in the trading of flexibility products with a network DSO. Both shortflex and longflex products could be traded. Industrial loads had large flexibility potential but because of their costs couldn't be activated very often. These loads would fit better in a DFS product used for winter peak reserves.

## France

France is one country that has kept its vertically integrated electricity market and has government policy in place to assist with technology research, development, and demonstration. There are many examples of French electric technologies funded by EDF used in the New Zealand process industries.

Think SmartGrids is an industry association and makes the case to lead the national industrial scale deployment of flexibility focusing on demand side consumption. They suggest that there are three flexibility levers – a price lever on smart metering, load shifting in industry and demand side management in the building sector. The load shifting in industry is seen as key and is similar to a new DFS ancillary service. The main challenge is financing projects and the remuneration for delivering firm flexibility.

## USA

A big country with many different electricity markets and regional drivers. FERC has instructed all TNOs (Transmission Network Operators) to use and encourage third party aggregators.

PJM operates a large market had to put in place a demand response programme after their cascade black-out failure which they experienced across the Eastern States including New York in 2003. This could not have been done at this scale without aggregators using in the main industrial loads to minimise the risk of rolling blackouts from summer peak events.

The leading State for innovation in the energy transition is probably California. Their clean energy goals can only be met in reaching State policy maker goals with huge transmission upgrades. This challenge is seen as a coordinating one by the California ISO.

The immediate threat of summer blackouts is being handled by FlexAlerts. A request goes out to all consumers to take action and people get money back and are rewarded in taking action to FlexAlerts.

California works as part of the Western Energy Imbalance Market and delivers energy at the lowest cost in real time. In the short term, an extended day ahead market is going to be launched as part of the mix of tools needed for the transition at this scale. Such a day ahead market could bring out the inaccessible industrial loads that cannot be dispatched in real time. “The balancing act of the future will require a lot more tools like this” – the California ISO, January 2024.