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To: The Electricity Authority

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We support the objectives of the Authority's paper

Genesis Energy Limited (**Genesis**) welcomes the opportunity to comment on the Electricity Authority's (**the Authority**) *The future operation of New Zealand's power system* consultation paper.

We support the Authority undertaking this work, and agree it is prudent to begin planning for changes that are already beginning to impact power system operation. Rapid rollout of new renewable generation, distributed energy resources (DER), and battery energy storage systems (BESS), will be critical to supporting power system stability as New Zealand moves to an electrified economy with higher demand peaks and a higher share of renewables. Enabling this will likely require changes to the current regulatory regime governing power system operation and may require changes to network planning and investment.

While some of the issues identified are likely to arise over the medium-to-long-term horizon, some are already impacting investment decisions by industry participants. Regulations and market design are already impacting investment decisions (by shaping incentives) as well as impacting timeframes and resourcing required to scope, construct, and operationalise new forms of generation and storage (namely, inverter-based resources and BESS) that will be critical for maintaining power system security and stability in the near-term. As noted in our submission to the Authority's consultation paper *Potential Solutions for Peak Electricity Capacity*, we therefore ask that the Authority prioritise work to ensure barriers to the timely, efficient rollout are removed, particularly work to improve utility-scale BESS access to the spot, reserves, and ancillary services markets.

Another critical issue will be ensuring Transpower has adequate resourcing, tools, and the appropriate principal performance obligations (PPOs) and ancillary services procurement plan to meet the system operation challenges (particularly risks to power quality and network planning and investment challenges identified in the current paper). Also noted in our submission to the Authority's *Potential Solutions for Peak Electricity Capacity* paper, Genesis supports development of a new integrated standby ancillary service. We also support giving the System Operator tools to economically constrain on assets such as the Rankine units as a prudent contingency if market-driven solutions are not adequate, including to mitigate the risk that BESS and demand response progress proves slower than assumed by the Authority.

Yours sincerely,

A handwritten signature in black ink, consisting of a series of loops and a long horizontal stroke extending to the right.

Mitchell Trezona-Lecomte
Senior Advisor, Government Relations and Regulatory Affairs

Genesis's response

Question Number	Question	Genesis response
1.	Q1. 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. Pg. 24 (section 3)	Yes, we agree section 3 provides an accurate summary of existing arrangements.
2.	Q2. 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. Pg. 36 (section 4)	Yes, we agree this section captures the key drivers of change.
3.	Q3. Do you have any feedback on our description of each key driver? Pg. 36 (section 4)	No feedback.
4.	Q4. What do you consider will be most helpful to increase coordination in system operation? Please provide reasons for your answer. Pg. 39 (section 5)	<p>We agree the possible changes identified could be helpful and merit further investigation. Changes to ensure rapid integration of new renewables, and to enable greater participation by BESS in the power system, should be prioritised.</p> <p>We agree in principle with developing common standards to enable interoperability. However, these should remain 'opt-in' for the consumer (rather than by-default), and be future-proofed in design to allow for future evolution and innovation and prevent technology lock-in. It will also be important to ensure efficiency benefits created by interoperability are passed through to consumers.</p> <p>Five-minute time blocks for price settlement warrant further investigation. Care will need to be taken to ensure increased 'resolution' for price settlement does not exacerbate other risks identified in the Paper, namely risks to power quality resulting from increased power system complexity. Moreover, consideration of five-minute time blocks raises other, broader questions about market design, for example whether to implement a day-ahead market. Therefore, we recommend the Authority broaden the scope of work to include consideration of further changes to real-time pricing (up to 36 hours before dispatch) more generally could improve power system operation and help mitigate the risks identified in the Paper (rather than considering this idea in isolation).</p> <p>While we agree greater visibility of DER on distribution works is desirable, there must be adequate protections for commercially sensitive data. Currently, data exchange between EDBs and other participants (such as Genesis) is facilitated under contractual agreements based on the Authority's default-distributor agreements, which include contractual provisions ring-fencing the data to prevent it being shared with non-regulated subsidiaries of EDBs engaged in competitive markets. However, enforcement against breaches of ring-fencing provisions requires third parties to initiate an audit process which, if proven to be unsubstantiated, is costly. Stronger protections against misuse of data may be appropriate to give industry greater confidence to participate in these fledgling markets.</p>

		A DSO model may be appropriate in New Zealand and merits further investigation, although it is difficult to assess its suitability without further evidence as to the scale of the problem. One way to assess the scale of the problem would be to look at EDBs with high levels of solar or wind connected (or planned for connection).
5.	Q5. Looking at overseas jurisdictions, what developments in future system operation are relevant and useful for New Zealand? Please provide reasons for your answer. Pg. 39 (section 5)	<p>In many jurisdictions, the common denominator is that system operators (whether national or regional) face challenges due to the significant increase of intermittent generation, many caused by the conditions set under regulatory regimes that limit the ability for the system operator to prepare for such challenges, as well as availability of resources, long consenting timeframes, and long lead times to improve and increase grid infrastructure.</p> <p>Solutions identified by jurisdictions with high levels of instantaneous non-synchronous penetration, for example synchronous condensers and grid-forming invertors being explored in Australia and Ireland, to manage system strength and inertia may be appropriate in New Zealand, given our growing non-synchronous penetration. In principle, tools to aid whole-of-system network planning, and to enable development of flexibility markets (e.g. trading platforms or marketplaces) also warrant further investigation.</p>
6.	Q6. Do you consider existing power system obligations are compatible with the uptake of DER and IBR-based generation? Please provide reasons for your answer. Pg. 41 (section 5)	<p>We agree with the Authority's concerns regarding risks to power quality and support the Authority undertaking work now to address these risks. Of highest importance should be ensuring the System Operator has adequate resourcing, the right PPOs and Procurement Plan, and the right tools. For example, Transpower may need to undertake market studies and may need new PPOs/Procurement Plan in relation to power quality, such as inertia, to address the risks noted. The model for SO funding, specifically cost recovery of Ancillary Services may also need to be reviewed and changed, including to ensure cost recovery is rationally spread among all industry participants on the basis of user-pays (and prevent 'free-riding').</p> <p>We believe changes will be necessary to enable efficient and timely uptake of IBR-generation and BESS. Given their importance to the stable operation of a highly renewable power system, priority should be given to removing unnecessary barriers to their deployment.</p> <p>If new technology is introduced, such as BESS, it's important that the regulatory framework, including any technical requirements (such as related to fire protection) are assessed and reviewed against transparent rules and regulations, where necessary issued by the Authority. New technologies require large investments and risk acceptance, and unclear regulations or requirements risk undermining roll-out.</p> <p>As noted above, we ask that the Authority work with Transpower as a matter of priority to ensure that adequate regulation is in place and Transpower has sufficient resourcing to support the new renewable energy projects and technology such as BESS effectively.</p>
7.	Q7. Do you consider we need an increased level of coordination of network planning, investment and operations across the New Zealand power system?	Yes, in principle we support better integration and system-wide network planning and operation, both at Transpower and distribution level. In overseas jurisdictions the collaboration between the national grid operator and regional grid operators became a bottleneck which can be resolved by good planning, operation and collaboration. As noted above, we are concerned resourcing and the funding and cost recovery model for Transpower and electricity distribution

	Please provide reasons for your answer. Pg. 44 (section 5)	businesses may undermine their ability to respond to future power system challenges, including transmission network planning and investment. We note improving visibility of DER on distribution networks could be achieved by publishing data that is already captured on the registry.
8.	Q8. 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. Pg. 47 (section 5)	As we have noted in previous submissions, we consider that the current regulatory regime for network investment and cost-recovery (price-quality pathways) has the potential to create an uneven playing field for non-regulated activities such as ownership and operation of DER or BESS. Ensuring there is competition and a level playing field will be critical to unlocking the potential of flexibility services and markets and ensuring DER and BESS can support future power system operation. We therefore believe the Authority's work programme should include consideration of any barriers to third-party investment in new technology on electricity networks. We note the Authority's distribution sector regulatory reform project will include an upcoming paper to be released in June on guidance for extending the arms-length rules.
9.	Q9. 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. Pg. 47 (section 5)	Yes. We agree it is prudent for the Authority to start planning now.