



16 March 2022

Dear Tony Baldwin, Chair, Market Development Advisory Group

Submission to MDAG on the 100%RE Discussions Paper

Introduction

1. Electra Limited (Electra) welcomes the opportunity to submit on the Market Development Advisory Group (MDAG), *Price Discovery Under 100% Renewable Electricity Supply*, Issues Discussion Paper, 2 February 2022 (the 100%RE Discussions Paper). Nothing in this submission is confidential.
2. Overall, we believe that MDAG has captured the issues around how the electricity system is likely to behave with 100% renewable supply and has identified the key issues that may need to be addressed from a market design perspective.
3. Electra appreciates the engagement structure in this review – particularly staging the discussion into the 3 phases of Issues (this response), Options Identification, and Solutions. We believe this format will allow a fairer, more robust decision process. However, some of the questions crossed the line into the next consultation phases of Options Identification and Solutions. Electra has attempted to focus our answers solely on the Issues phase.
4. Appendix A includes our answers to the 100%RE Discussions Paper questions in MDAGs preferred format.
5. The primary contact for this submission is—

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Impact on Electra

6. Electra's customers are also its stakeholders. Electra feels a duty of care to advocate for our customers on matters, such as market reforms, that will likely impact their welfare. We want to ensure that customers are paying fair cost-reflective prices for their service as a whole.
7. Electra is committed to the decarbonisation and electrification of energy used in our economy. The transition focuses on renewables only, assuming geothermal is included as a type of renewable energy. Electra believes the market should be technology-agnostic to transition to low-carbon energy generation. Options such as hydro storage, modern nuclear power, and low-emissions geothermal should be valued for their dispatchable contribution to New Zealand's grid.
8. The current direction of distributed flexible services at the Low Voltage (LV) network level is challenging. Customer buy-in, large-scale coordination, voltage regulation, and congestion are just some of the issues to overcome. Electra's preference is to encourage the development of DER in a 'semi-centralised' manner, connecting 10-30MVA of DER at a time to the subtransmission network. The approach would ease the challenges compared to LV development and significantly lower the economic cost.
9. Electra would like to promote, and may even facilitate, local community cooperative investment in semi-centralised DER. We would like to see the energy market accommodate such arrangements well in the future.

Appendix A — Submission in MDAG preferred format

Submitter:	Electra Limited
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Question		Page references	Comment
Q1.	<p>Do you agree with the broad conclusions that emerge from the simulations in relation to spot price levels and volatility, in particular:</p> <p>(a) significantly more spot price volatility is likely with a 100%RE system, especially shorter-term weather driven volatility?</p> <p>(b) New Zealand's sizeable hydro generation base is likely to moderate the growth in volatility to some extent, making extreme oscillations between zero and shortage spot prices relatively unlikely?</p>	p18, p61	<p>The following answers are qualified as Electra has not verified the modelling.</p> <p>(a) We agree that the conclusion applies to short-term volatility and disagree with the implication that medium and long-term volatility is of little concern.</p> <p>(b) No, not likely. More clear, quantitative evidence should be sought to support this conclusion.</p> <p>a. While the ideal model may have quantified the proportion of inflexible renewables, the likelihood of these proportions eventuating doesn't appear to be well supported. Further sensitivity analysis on non-flexible renewable mix may be needed.</p> <p>b. DER is unlikely to be directly exposed to the wholesale market as it serves many purposes other than energy speculation that can be mutually exclusive.</p>
Q2.	<p>If you disagree, what is your view and reasoning for it?</p>	p18, p61	<p>The perspective of the statement in (b) above, "likely to moderate," is assumed by Electra to be compared to other grids dominated by thermal generators that non-dispatchable renewables will replace. As supported by Dr. Gavin Bell's <i>Comparison with Nordic experience</i> on page 61 of the 100%RE Discussions Paper, we feel that the growth moderation assumption may be overstated.</p>

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<p>Q3. Do you agree that in a 100%RE system there will be many diverse and disaggregated resources to coordinate, and that a wholesale market will be the preferred mechanism to coordinate plans and actions among all the resource owners? If you disagree, what is your view and reasoning for it?</p>	<p>p18, p61</p>	<p>No, the wholesale market, as it stands – including FTR and hedge, is not the preferred mechanism.</p> <p>Yes, a 100%RE has a highly dynamic and challenging coordination problem.</p> <p>No, the existing wholesale market is not the preferred option.</p> <ul style="list-style-type: none"> (a) The govt policy of a liquid and transparent hedge market in the early 2000s hasn't eventuated. The policy should avoid stifling competition, efficiency, and innovation in the generation and retailer sectors and may have already contributed to several grid emergencies. (b) The low SRMC of a 100%RE market makes the "market clearing price for all suppliers" unworkable or highly inefficient. (c) The "just in time" incentive to develop new supply only when new demand is committed is not conducive to a fast build-up of renewables towards 100%RE by 2030. At least 500MW/yr of new supply is forecast to be required. Without an incentive to begin now, the target seems ambitious. (d) The FTR market may not scale well to include more nodes, especially distribution. (e) The price path regulation of Transpower suggests that the economic cost of capacity constraint is not a justifiable input to their grid investment decisions. Even if it was foreseeable, the 5-year horizon for price path reset precludes Transpower's regulated investment

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		<p>decisions from having a meaningful impact on the rapid development of 100%RE.</p> <p>(f) The coordination of DER in distribution networks is ignored in our current wholesale market.</p> <p>(g) VPPs are an apparent solution but ignore the capacity constraints of distribution networks.</p> <p>(h) Dry year risk is not managed efficiently or at all.</p> <p>(i) Theoretically, there may be a risk of overloading distribution networks in short-term volatility scenarios. Without transmission-connected storage, renewable buffering by DER may coincide with demand peaks, resulting in upgrades to distribution at a significant cost.</p> <p>(j) In its current arrangement, the real-time market is vulnerable to collusive behaviour by suppliers taking advantage of controlling resource availability to manipulate spot prices.</p> <p>(k) The market is vulnerable to gen-tailers with a large balanced supply/demand taking advantage of transmission constraints to create a market island, causing a supply constraint to the wider market. If the supply constraint is a large enough proportion of the market, it can seriously impact the gentailer's (and all) customers' unit price. The higher prices from the wider market allow the gentailer to offset the costs required to incentivise the islanded customer demand not to shut down and leave the market due to poor economics. The ideal outcome would be to upgrade the grid to connect the island allowing the wider</p>

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			market supply to increase, resulting in significant savings to all customers.
Q4.	Do you agree that these are the key issues in relation to real-time coordination? If you disagree, what is your view and the reasoning for it?	p20, p69	<p>Yes, as well as (e), (f), (h) and (i) responses to Q3 above.</p> <p>Also noting these premises:</p> <ul style="list-style-type: none"> • Paragraph 7.7 infers rooftop PV won't be controlled (down), but paragraph 7.8 states that BtM batteries and EV charging will be. It's an interesting position to take, given the same mechanisms are likely to be used, as is the case in Australia with DREDS. • Paragraph 7.8 implies that market prices will incentivise EV operators to control their load. The reality may be that market price impacts are not a strong enough signal to cause customers to act or decide on a controlled plan. It may not be a safe assumption that EV charging can be counted as inflexible demand. • Paragraphs 7.10 and 7.11 are not relevant for an 'issues' discussion.
Q5.	Do you agree that these are the key issues in relation to ancillary services with 100%RE? If you disagree, what is your view and the reasoning for it?	P21, p74	Yes. We note that the need to expand the ancillary services market may encourage a review of whether a capacity market or other alternative may be more efficient.
Q6.	Do you agree that these are the key issues in relation to price signalling with 100% RE as summarised in paragraph	P24, p88	Yes. The most pressing issue is consumer engagement. Most consumers perceive that they are already paying too much for their electricity. Changes to prices that result in consumers incurring "higher prices" are likely to be

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7.88 above? If you disagree, what is your view and the reasoning for it?		perceived as gouging and economic rents even though the prices might be signally economic costs and therefore be efficient.	
Q7.	Do you agree that the preconditions in paragraph 7.78 would need to be in place for an energy-only market design to be effective? If you disagree what is your view and the reasoning for it?	P24, p88	At this stage of the consultation, we reserve commenting on solutions to market design until the next phases of the consultation.
Q8.	Do you agree that we should take forward to the next stage of the process (options identification and analysis) the measures referred to in paragraph 7.89 above? If you disagree, what is your view and the reasoning for it?	p24, p88	We disagree with paragraph 7.89(a) and agree with (b), especially (iii). Measures in (a) suggest that the complaint of high spot prices is a matter of limited perspective. However, the discussion elsewhere appears to have mostly centred around real manipulation by participants, for which the market is susceptible.
Q9.	Do you agree that these are the key issues in relation to demand-side flexibility with 100%RE? If you disagree, what is your view and the reasoning for it?	p25, p93	Disagree. Paragraph 7.103 doesn't identify any issues. It asks what features are needed for DSF. We understand this question is intended for a later discussion. Electra believes the key issue holding back DSF is the lack of technology implementation in the appliance sector. The existing ripple control technology is slowly eroded and misses the storage feedback mechanism needed to optimise DSF. Lines companies are trying to coordinate a standardised approach currently but need support.
Q10.	Do you agree that these are the key issues in relation to contracts markets with 100%RE? If you disagree, what is your view and the reasoning for it?	p26, p98	Disagree. Paragraph 7.124(a) doesn't identify any issues. Rather, the paragraph asks what features are needed for risk management products. We interpret this question as asking for options identification or a solution. It is better answered in a later phase of this consultation.

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			In our view, the key issue with the hedge market appears to be a lack of liquidity due to the bulk volume transacting through off-market agreements.
Q11.	Do you agree that these are the key issues in relation to transition to 100%RE? If you disagree, what is your view and the reasoning for it?	p28, p102	<p>Yes. Especially paragraph 7.138(b), rephrased as an issue instead of a solution—fossil-fuelled units are unlikely to be retired unless they become uneconomic due to significantly higher carbon or fuel prices or a push from regulatory change.</p> <p>Currently, fossil-fueled units serve a valued purpose, i.e., dry year mitigation. Relying on prices to force their exit is a gamble. Alternative firming capacity is likely to be slow to develop due to competition from incumbent fossil-fuel generators.</p>
Q12.	Are there any other 'lumpy' issues that warrant specific consideration in the transition to 100%RE?	p28, p102	The lack of competition is a central concern of this review. Oligopolies control most generation and retail bases (i.e., vertically integrated entities), which perpetuates the lack of competition in the New Zealand electricity market. The lack of competition driven by an oligopoly market was a key finding of the <i>Energy Policies of IEA Countries New Zealand 2017</i> . Page 75 of the IEA report depicts the surge in energy pricing coinciding with the reforms of the late 1990s that were pivotal in forming the gentailer oligopoly that still exists.
Q13.	Do you agree that we should analyse how competition in the wholesale market is likely to be affected by a shift to 100%RE, in particular, in competition for seasonal flexibility services? If you disagree, what is your view and the reasoning for it?	p29, p104	<p>Yes. As noted in Q4 regarding EV storage, better supporting evidence that EV owners will decide to offer their storage into a flex market needs to be found. A slight marginal discount on retail energy may not be a strong enough pricing signal to offset the convenience of driving autonomy.</p> <p>More supporting evidence of centralised storage would likely strengthen arguments for the optimal solution. Currently, the debate is turning political with commercial interests casting doubt or deferment on feasible options.</p>

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		<p>Electra notes that recently, the promotion of a centralised pumped-hydro for seasonal flexibility service has been publicly criticised by participants in the supply sector. Alternatives proposed to date for seasonal control, such as lithium-ion grid storage (at least 1000x CAPEX of Onslow on energy stored) or green hydrogen storage (70% energy spill), appear unrealistic by comparison.</p> <p>Refer to:</p> <p>https://www.stuff.co.nz/business/123360959/contact-says-lake-onslow-scheme-would-paralyse-investment-in-renewables</p> <p>https://pubs.rsc.org/en/content/articlelanding/2015/ee/c4ee04041d</p>
<p>Q14. What other key areas of opportunity or challenge (if any) will arise in the wholesale electricity market with 100%RE that are likely to have a significant impact in relation to achieving the statutory objective of the Authority, which is to "promote competition in, reliable supply by, and the efficient operation of, the electricity industry for the long-term benefit of consumers"?</p>	<p>p29,p104</p>	<p>As answered in Q12 above, the oligopoly that spans the supply and demand sides of the market is a structural problem that affects competition, liquidity, system security and hampers the transition to 100%RE.</p>