

15 November 2024

Electricity Authority
By e-mail: forecasting@ea.govt.nz

Dear Electricity Authority,

Review of forecasting provisions for intermittent generators - proposed Code amendments

Lodestone Energy welcomes the opportunity to provide feedback on the Electricity Authority's consultation about forecasting provisions for intermittent generators. This letter forms the entirety of our submission and includes some brief background on Lodestone.

Lodestone Energy was founded in 2019 with the mission to "harness the sun's energy to power Aotearoa's zero carbon future". We were the first company in NZ to deliver utility scale solar bid into the market and currently have two operating solar farms near Kaitaia and Edgecumbe, and a third about to be commissioned at Waiotaha in the next month. We have a fourth solar farm under construction near Whitianga, with a planned pipeline to deliver another 9 sites over the next few years.

In our original submission Lodestone indicated that we were supportive of the idea of a centralised forecasting system for intermittent generators, particularly for smaller scale generation companies that don't necessarily have the resources to implement their own sophisticated forecasting systems. However, at first glance what is being proposed in the paper appears to be more complex than originally anticipated, particularly in terms of integration between the intermittent generators and the centralised forecaster.

Lodestone has spent significant time and money on establishing its existing automated electricity market offering system for its first three solar farms. While it would be unlikely to meet the 6 day ahead forecasting standards that are being proposed in the paper for self-forecasting, it is functional and fit for purpose particularly at 6 hours ahead.

While we recognise the potential net economic benefits of the proposed centralised forecasting service, Lodestone is concerned that there is insufficient information provided in the paper for respondents to fully understand the implications of the proposed Code amendments. For instance:

- 1) what specific data is going to be required by the centralised forecaster from each generation station?
- 2) what format will the data be required in and over what service or channel will it be transmitted (e.g. ICCP, SFTP)?
- 3) how often will the data be polled and FOGP returned by the centralised forecaster?

Without knowing the specific details, we cannot determine how much effort (and cost) will be required to integrate with the proposed system. It is not straightforward to give third parties access to SCADA systems and cybersecurity needs to be taken into account. It will not be a simple matter for participants with intermittent generation to transfer to the new system and the proposed three month transition period is too short for what is a major operational system change.

<p>Q1. Do you agree that the proposed Code amendments are necessary to give effect to the Authority's policy decisions? If not, please explain why.</p>	<p>In principle, we agree that the proposed amendments give effect to the policy decisions made by the EA. However, as noted above it is difficult for us to determine the degree of impact that the proposed Code amendments will have on Lodestone's existing offering processes, and the cost of changes that will be required to our existing infrastructure.</p> <p>Specific comments on proposed amendments below:</p> <p>13.9B - the amendment that an <i>"intermittent generator must, in response to a request from the approved forecaster, provide any information reasonably required by approved forecaster for the purpose of providing an approved forecast, as soon as practical after receiving the request"</i> appears to be open-ended.</p> <p>Lodestone questions who will determine what is reasonably required and when will intermittent generators know what these requirements are?</p>
<p>Q2. Do you agree that intermittent generators will be required to submit their first offer six days before the beginning of the trading period to which the offer relates? What impacts, if any, would this change have on you?</p>	<p>Lodestone currently submits offers six days ahead so this specific amendment does not impact us - except for the additional burden of having to revise such advanced offers for changes in weather forecast from the centralised forecaster.</p> <p>As per our original submission, we believe that it is unlikely that centralised forecasting of solar generation 6 days ahead will provide any degree of accuracy due to the non-linearity of weather systems. Our current offer process therefore assumes a sunny day profile for the time of year 6 days ahead (adjusted for known outages) as any attempt to model cloud impacts on generation that far out will inevitably be wrong.</p> <p>Energy Storage</p> <p>We anticipate that storage systems will soon be integrated behind grid connection points at generation sites. When this occurs, centralized forecasts may not accurately reflect generation expectations. Generation will depend on both the available resources and storage utilisation strategy at the time.</p> <p>It is essential to preserve storage flexibility across all users to support efficient market operations. We urge the Electricity Authority (EA) to provide guidance on this matter to avoid any unintended consequences that could restrict the use of embedded batteries due to the Code changes.</p>
<p>Q3. Do you agree with the revised decision that all industry participants (ie, not only generators) should be required to contribute to the costs of the</p>	<p>We agree. Noting that intermittent generators will still be incurring (as yet unknown) upfront and ongoing costs to support the centralised forecasting system.</p>

centralised forecast rather than generators only?	
Q4. Do you agree the Authority's proposed Code amendments complies with section 32(1) of the Act?	No comment.
Q5. What inputs would intermittent generators need to provide to the centralised forecaster to produce accurate generation forecasts? Would there be issues with intermittent generators providing this information?	<p>To produce accurate forecasts, the centralised forecaster will need additional plant capability information beyond what is provided in the Asset Capability Statement (ACS).</p> <p>The following factors will impact the accuracy of the centralised forecast of a solar farm.</p> <ol style="list-style-type: none"> 1) Latitude / longitude and physical dimensions of the site. 2) Fixed tilt or tracking - this has a significant impact on the output profile. 3) Wind response - different types of trackers will stow at a fixed position (e.g. flat) in response to high wind speeds to protect the array. 4) Orientation of arrays - fixed or tracking arrays may not be oriented towards the north which changes the daily shape of the output. 5) Overbuild ratio - the ratio of installed DC capacity compared to AC capacity will impact the shape of the output on sunny days. <p>How will the centralised forecaster establish its models to account for these factors? Or will it just assume a simplified fixed or tracking solar farm profile and not worry about those other factors? We see potential for significant work for intermittent generators to educate the centralised forecaster.</p> <p>In terms of real time variables to be supplied by the intermittent generator, the following could potentially be provided for solar farms (subject to agreed / secure data transfer protocols):</p> <ul style="list-style-type: none"> • Global horizontal irradiation (W/m²) • Ambient temperature (°C) • Measured windspeed (m/s) - important for tracker wind stow. • No of inverters operating • Maximum output capacity (MW) - this will be reflective of the number of inverters operating and any externally imposed constraints from the lines company. <p>The above weather related variables may be sourced from more than one weather station on site and whether these are averaged and accounting for data quality (e.g. loss of comms to a device) will need to be considered in implementation.</p> <p>Plant availability - Lodestone currently makes use of Transpower's Planned Outage Coordination Process (POCP)</p>

	<p>to record planned outages or constraints for its solar farms, which is utilised by our own forecasting system to adjust the offers up to six days ahead. This might be a sensible solution for other intermittent generators providing information to this proposed centralised forecasting system - particularly small-scale generators that may not have the resources to implement outage management systems that are accessible to the centralised forecaster.</p> <p>Providing future outages in any other format / system to the centralised forecaster would be costly to implement.</p>
<p>Q6. Do you have any comments on the drafting of the proposed Code amendments?</p>	<p>See the previous comment on embedded batteries. Drafting should allow for clarity of this situation.</p> <p>The proposed three month period to transition to the new arrangement is too short a period for intermittent generators to implement the system. The time that it would take to scope the changes with the relevant software developers / service providers, design, implement and test the systems could take up to six months, depending on the complexity of what is being proposed.</p> <p>We recommend that a Technical Working Group is established to agree on a cost effective and secure set of data transfer protocols.</p>

Kind regards



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