

15 July 2025

Submissions
Electricity Authority
P O Box 10041
Wellington

Via email: fsr@ea.govt.nz

Dear team,

Re: Consultation Paper— [Promoting Reliable Electricity Supply: Voltage-related Code Amendment Proposals](#)

NewPower Energy Services Ltd (NewPower) appreciates the opportunity to make this submission on the Electricity Authority's (Authority) consultation on the proposed voltage related code amendments.

NewPower, the holding company for Infratec NZ Limited (Infratec) and NewPower Energy Limited (NEL), are subsidiaries of WEL Networks Limited, New Zealand's sixth largest Distributor. Infratec, an Engineering, Procurement and Construction (EPC) company, is delivering low-carbon utility-scale solar and battery solutions at a time of unprecedented growth in New Zealand. Infratec developed and commissioned Rotohiko, NZ's first utility scale 35 MWh battery energy storage system (BESS) facility at Huntly, connected to WEL Networks' distribution assets. By way of context for this submission, NEL is the owner, operator and trader of generation assets including the Rotohiko BESS, which operates within both Network and Grid compliance modes, and so can offer a range of network, transmission, and energy market services within NZEM's wholesale market dispatch compliance rules. This BESS is already contracted to the System Operator as an ancillary service agent for instantaneous reserves.

Infratec has also constructed and commissioned approximately 118 MW of utility-scale solar farms connected to distribution networks across New Zealand for both NEL and customers, with an additional 80 MW currently under construction.

Key points in our submission

In summary:

1. In NewPower's prior submission to the Authority's voltage variability consultation in June 2024, NewPower had the following key points, and we would like to highlight them again:
 - NewPower was against Option 1 and Option 2 as so far as these options were implemented to allow the System Operator to utilise distributed generation to control the voltage and reactive power flows on the transmission network. Our view is that Distributors should control voltage and reactive power flows on the **distribution** network. We note the Authority is not implementing changes related to Option 2 at this time and is investigating further, which we believe further consultation on this is essential.
 - NewPower raised that it had experienced restrictive voltage limits for distributed generation being enforced by Distributors, which limited energy production from these distributed generation sites. There is no guidance in the code or technical guidelines that specifies how Distributors should determine voltage limits for distributed generation. NewPower suggests that if this is not already in scope for the EEA's review on Distributors connection standards it should be. This is particularly relevant given the Government's decision to expand the regulatory voltage limits on LV networks to +/- 10% to enable more LV distributed generation. We recommend that the Authority puts consideration into what the voltage limits should be on Distributor's MV networks (i.e. 11 kV and 33 kV) with the aim of unlocking more distributed generation.
2. NewPower is supportive of this alternative solution proposed by the Authority: "Establish a new ancillary service contract for reactive power management". NewPower's view is this ancillary service market will definitely be required in the long term. Especially the creation of a dynamic voltage support product, NewPower has highlighted that Inverter Based Resources (IBR) can act like a STATCOM and would be able to provide this service at a fraction of the cost of installing a STATCOM on the transmission grid. Having this robust dynamic voltage support product will help to prevent large scale outages with a better economic outcome.

NewPower have completed a brief analysis on comparing the cost of a STATCOM providing dynamic voltage support against the cost of a BESS providing dynamic voltage support. Our analysis indicates that BESS providing dynamic voltage support will be significantly more economic than dedicated dynamic voltage support devices (i.e. STATCOMs). The reason for this is that BESS can offer multiple services (i.e. energy, peak reductions, frequency regulation, reserves, etc) on top of dynamic voltage support.
3. NewPower is supportive of legacy clause(s) in the proposed Code changes. This will avoid or defer costly upgrades to generation that was built without compliance to the new Code changes factored into the design.
4. NewPower notes that the Authority has not specified a voltage range for which distributed generation must supply the required reactive power over in the proposed code changes. This means that distributed generation technically must provide the required reactive power for

all voltages at the point of connection. NewPower notes that for grid connected generation there are specified voltage ranges for the reactive power requirements in clause 8.23.

5. NewPower believes the definition of maximum export power should be modified to state “(b) the power export limit *which applies to at least a full trading period imposed by an active power export control device under normal system conditions*”. This ensures that generators with a standard rating below the threshold with a short-term overload rating over the threshold are encouraged to use this overload capability to support the system without incurring additional onerous requirements (i.e. frequency management and voltage management).
6. Regarding clause 8.25B, NewPower recommends changing 8.25B(3) to the following: “Subclause (2) does not apply to an *intermittent generating station* if there has been a reduction in the intermittent ~~wind~~ power source during the 6 seconds following the commencement of the fault. “. This clause should be for all intermittent generators and not just wind, otherwise it would have the unintended consequence of requiring batteries to be installed on other types of intermittent generation.
7. NewPower would like to re-iterate that these proposed code changes will result in generators incurring additional costs. Generators will need to recover these costs through other market products like energy and reserves (likely pushing the price of these products up to compensate).
8. NewPower would like to encourage the Authority to investigate grid forming IBR and its role in maintaining system strength / inertia. Having grid forming inverters will increase the amount of IBR that can run at any given time while keeping the power system stable. Implementing grid forming inverters will come at additional cost for generators, and therefore NewPower believes there should be financial incentives for generators to implement grid forming inverters for IBR to cover the additional costs.
9. In the past the Authority has provided robust net benefit calculations for code changes, however we note the absence of a net benefit calculation for these proposed code changes. The Authority has stated the “**cost of proposed Code amendments are relatively significant**”. If this is the case, NewPower believes the Authority should provide the net benefit calculation to support the proposed changes.

NewPower welcomes discussion with the Authority on any points in our submission that the Authority would like further clarification or information for.

Yours Sincerely,



David Barnett
CEO
NewPower Energy Services Ltd

Appendix 1: NewPower's response to the consultation questions

Questions	Comments
Q1. Do you agree the issues identified by the Authority are worthy of attention?	Yes.
Q2. Do you agree with the objective of the proposed amendment? If not, why not?	Partially. The objective should state that the Authority aims to achieve the objective in the most economical way for consumers.
Q3. Do you agree we have correctly identified the benefits and costs of the proposed amendment?	<p>No.</p> <p>NewPower notes that there are no calculated benefit values for:</p> <ul style="list-style-type: none"> • A more secure and resilient power system • Reduced losses on the power system • Supporting the quality of electricity supply to consumers <p>NewPower notes that there are no calculated cost values for the following:</p> <ul style="list-style-type: none"> • Costs associated with increasing active power output export capability • Energy losses associated with providing reactive power. <p>NewPower believes that the Authority should provide cost / benefit values for the items listed above.</p> <p>The proposed code amendments do not eliminate the need for dynamic voltage support (i.e. installation of STATCOMs). These dynamic voltage support devices are required in areas where the power system is weak. NewPower does not think that the Authority should use avoided costs for all potential future STATCOMs or SVCs as a benefit. It is not obvious that generation providing voltage support is going to materially defer the costs of providing transmission scale dynamic voltage support equipment.</p> <p>An additional benefit of the proposed code changes is that it will have the effect of encouraging modular power device to be compliant with the voltage and ride through regulations. For example, a 50 MW plant may be made up of one hundred and seventy 300 kW string inverters. The inverters would be identical to the units used on a 1 MW installation, so capable of the same voltage regulation and fault ride through. This is something that should be considered as an advantage.</p>

<p>Q4. Do you agree the benefits of the proposed amendment outweigh its costs?</p>	<p>No, NewPower does not believe that the Authority has provided a sufficient evaluation of the costs and benefits. There is no estimated total cost vs benefit analysis (i.e. demonstrating a net positive benefit). The Authority states “Having evaluated the Code amendment proposal’s benefits and costs, the Authority considers the proposal has a net benefit.” But doesn’t provide any quantifiable evidence of this.</p> <p>The Authority has stated that the cost of proposed Code amendments is relatively significant. If this is the case, NewPower believes the Authority should provide a the net benefit calculation to support proposed code changes.</p> <p>It has not been demonstrated that mandating default reactive power requirements of 33% of the maximum continuous MW output power of the generating station is optimal for voltage management on distribution networks, or whether IBR should be treated differently due to its characteristics.</p>
<p>Q5. Do you agree the proposed amendment is preferable to other options?</p> <p>If you disagree, please explain your preferred option in terms consistent with the Authority’s statutory objective in section 15 of the Electricity Industry Act 2010.</p>	<p>No. Especially not in the long term. In NewPower’s view these changes won’t make much difference from the status quo as embedded generation already perform voltage control as enforced in the connection agreement by Distributors. Also, IBR (particularly grid forming) has a good ride through capability provided the network is strong enough.</p> <p>It is hard to decide if the proposed option is preferable to the other options as there is no net benefit calculation for any of the options.</p> <p>The proposed changes don’t cover fast acting dynamic voltage support. The proposed changes may help dynamic voltage issues slightly, but they do not remove the need for fast acting dynamic voltage regulation and short circuit current. NewPower suggests that the Authority develops an ancillary service product for dynamic voltage support that IBR can provide at a lesser cost than building new transmission or distribution STATCOMs.</p> <p>A possible additional option is to procure additional instantaneous reserves to cover the lack of ride-through capability of generation plant. With a code amendment to make the “non-compliant” generation pay the additional costs of reserves.</p>

<p>Q6. Do you agree the proposed amendment complies with sections 17(1) and 32(1) of the Act?</p>	<p>No, NewPower does not believe that the Authority has provided a sufficient evaluation of the costs and benefits. There is no estimated total cost vs benefit analysis (i.e. demonstrating a net positive benefit). The Authority states “Having evaluated the Code amendment proposal’s benefits and costs, the Authority considers the proposal has a net benefit.” But doesn’t provide any quantifiable evidence of this.</p>
<p>Q7. Do you have any comments on the drafting of the proposed amendment?</p>	<p>NewPower assumes that the issues that applied for the definition of maximum export power in the frequency related code amendment also apply to the voltage related code amendment so repeats its submission for the frequency related Code amendment.</p> <p>The maximum export definition refers to generating plant, yet the AOPOs refers to the maximum export of a generation station. NewPower suggests that these definitions are aligned or linked.</p> <p>For avoidance of doubt, there should be clarity around how the maximum export power for generation stations with multiple generation plant should be calculated. It is not simply the summation of all nameplate ratings as there can be material losses between the generating plant and the point of connection. We would also like to highlight that the “nameplate” rating of intermittent generation is subjective.</p> <p>We suggest the following changes to the definition of “maximum export power” to cover the issues raised above and ensuring that generators with a standard rating below the threshold with a short-term overload rating over the threshold are encouraged to use this overload capability to support the system without incurring additional onerous requirements (i.e. frequency management and voltage management).:</p> <p><i>“maximum export power means, in respect of a generating plant, the lesser of— (a) the design maximum power that can be exported at the point of connection; or (b) the power export limit which applies to at least a full trading period imposed by an active power export control device under normal system conditions.”</i></p> <p>Regarding clause 8.25B, NewPower recommends changing 8.25B(3): “Subclause (2) does not apply to a wind generating station if there has been a reduction in the intermittent wind power source during the 6 seconds following the commencement of the fault. “. This clause should be for all intermittent</p>

	<p>generators and not just wind, otherwise it would have the unintended consequence of requiring batteries to be installed on other types of intermittent generation.</p> <p>NewPower notes that the Authority has not specified a voltage range which distributed generation must supply the required reactive power. This means that distributed generation must provide the required reactive power for all voltages at the point of connection. NewPower notes that for grid connected generation there are specified voltage ranges for the reactive power requirements in clause 8.23.</p>
Unintended consequences	<p>NewPower notes that a question on unintended consequences was not included in the Authority's consultation, we have added a section for this as it is generally included for consultations.</p> <p>Some unintended consequences of the proposed changes include:</p> <ul style="list-style-type: none"> • Higher costs of generation plant, which will likely lead to higher energy prices and potential for delays in generation build due to higher capital expenditure deterring some investors. • Dis incentivisation of non-wires solutions, due to increasing the costs and complexity of IBR generation • Will likely prevent building of IBR in low strength network areas due to fault ride through requirements. <ul style="list-style-type: none"> ○ The Authority should estimate the potential loss of generation projects due to this. • Requiring distributed generation to provide the required reactive power across all voltages at the point of connection is not feasible. This needs to be modified in the proposed code changes to specify a voltage range over which the distributed generation needs to be compliant.