

6 May 2021

Electricity Authority  
By email to [battery@ea.govt.nz](mailto:battery@ea.govt.nz)

Dear Authority

**Consultation Paper - Battery energy storage systems offering instantaneous reserve**

1. This is a submission by the Major Electricity Users' Group (MEUG) on the Electricity Authority (EA) consultation paper "Battery energy storage systems offering instantaneous reserve" (BESS offering IR) with appendices A and B published 8<sup>th</sup> April 2021.<sup>1</sup> MEUG members have been consulted in the preparation of this submission. This submission is not confidential. Some members may make separate submissions.

2. This submission has three themes:

a) First MEUG notes BESS can when charging physically provide IR by reducing power used for charging and therefore being equivalent to how an end consumer can reduce load to provide Interruptible load (IL). BESS therefore should be treated as load and the benefits and costs that accrue to load in terms of:

- The benefits of being able to offer IL.
- The costs of TPM benefit-based and share of residual charges.
- The obligation on North Island load to participate in the AUFLS regime.

MEUG raises this theme because we have seen a concerted effort by suppliers in the Transpower TPM implementation process to have grid scale batteries exempt from paying a share of TPM residual charges. The EA needs to be wary of investors in BESS wanting to "cherry pick" only the benefits of being load and avoid the costs and obligations that accrue to load. A scenario that allowed BESS to cherry pick only the benefits would create an incentive to retrofit batteries to existing loads to avoid load obligations and costs.

Batteries are just one type of energy storage device. MEUG recommends the Code and Procurement Plan amendments also cover other energy storage systems, such as capacitors that could provide IL.

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<sup>1</sup> Zipped document URL <https://www.ea.govt.nz/zipcontroller/download/4b74fa25c50fe48f3fa1467caf71f302>

- b) The South Australian Virtual Power Plant (VPP) using aggregated residential batteries (54 MWh of storage) has already proven large batteries downstream of the grid are feasible. That technology could be deployed in New Zealand sooner rather than later if the Code and Procurement Plan were agnostic to VPP.

It has been shown that there should be a super-fast reserves market because BESS can respond faster than PLSR and TWDR. Thereby a smaller capacity can halt a frequency drop more effectively. Below is the UK FS market design that allows wind turbines with inverter control to act as Virtual Synchronous Machines (VSM) not just batteries.

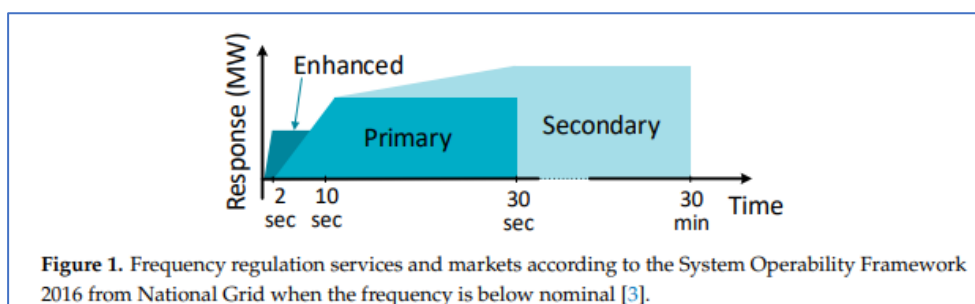


Figure 1. Frequency regulation services and markets according to the System Operability Framework 2016 from National Grid when the frequency is below nominal [3].

The proposed code amendment does not have a generalised and open definition of reserves as highlighted in the text with yellow background below. Instead PLSR, TWDR and BESS only are defined. This is contrary to the explanation text in the consultation paper at the top of the snapshot below with a tan colour background.

The following definition is generalised to refer to all types of reserve. The performance requirements for the sub-categories of reserve are included in the procurement plan.

**fast instantaneous reserve** means—

- (a) for providers of ~~partly loaded spinning reserve and tail water depressed reserve~~, the additional capacity—the increase in generation or reduction in load (in MW) provided by **instantaneous reserve** no later than 6 seconds after the start of a “Contingent Event” (as defined in the **policy statement**) and that is sustained until at least 60 seconds after the start of the “Contingent Event” for a period of at least 60 seconds; and
- (b) for providers of **interruptible load**, the drop in load (in MW) that occurs within 1 second of the grid system frequency falling to or below 49.2 Hertz that is sustained for a period of at least 60 seconds

**generation reserve** means a form of **instantaneous reserve** (including **partly loaded spinning reserve, tail water depressed reserve** and that provided by **battery energy storage systems**) which comprises generating capacity that is able to provide **fast instantaneous reserve** or **sustained instantaneous reserve** in accordance with the **procurement plan**

The above definition should be removed, and a more generalised definition used to allow VPP, VSS, capacitors (from paragraph 2 a) above) and other technologies that can provide IR.

In the UK and South Australia, a more generalised term “Energy Storage System” (ESS) is used.

c) MEUG is not convinced we need to rush to make the proposed changes. The primary reason other feasible alternatives were set aside was the perceived need of last year to accommodate an early closure of the Rio Tinto smelter as discussed in paragraphs [2.27] to [2.31] to accommodate a potential 100 MW BESS in the North Island to provide IR cover for higher HVDC flows. The risk of early closure no longer exists. We have more time to get Code and Procurement Plan changes to apply in a more holistic, generic and technology agnostic manner. Now is the time to reassess the three of the options in the paper that were set aside on the now known to be incorrect assumption of early closure of the Rio Tinto smelter:

- “more complex changes to market systems to co-optimize a wider range of dispatch outcomes”, paragraph [3.29 a)]
- “Changing the core specification of FIR and SIR to an option like an ‘area under the curve’ approach”, paragraph [3.29 c)]
- “Widening the solution to better accommodate distributed batteries”, paragraph [3.29 d)]

3. Responses to questions in the consultation paper follow:

Question	MEUG comment
1. Do you agree the issue identified by the Authority are worthy of attention?	Yes.
2. Do you agree with the objectives of the proposed amendment? If not, why not?	Yes, agree with the objectives.
3. Do you agree the benefits of the proposed amendment outweigh its costs?	Agree the benefits are likely to exceed the costs though greater net benefits may be possible as explained in the answer to Qu. 4 below.
4. Do you agree the proposed amendment is preferable to the other options? 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.	MEUG is not convinced the proposal is the best option. As discussed in: <ul style="list-style-type: none"> <li>• Paragraph 2 b) above, a more generic approach that future-proofs the definition of Energy Storage Systems to be technology agnostic may be better and should be considered in more detail.</li> <li>• Paragraph 2 c) above, MEUG has not discounted the options set aside in the consultation paper because the perceived need for urgency no longer exists.</li> </ul>
5. Do you agree the Authority’s proposed amendment complies with section 32(1) of the Act?	See answer to Qu. 4 above.

Question	MEUG comment
6. Do you have any comments on the drafting of the proposed Code amendment?	See answer to Qu. 4 above and paragraph 2 b) of this submission.
7. Do you have any comments on the drafting of the proposed procurement plan amendment?	No comments.

4. MEUG looks forward to the EA considering this submission.

Yours sincerely



Ralph Matthes  
Executive Director