Submission to the Electricity Authority

on the

Battery energy storage systems offering instantaneous reserve

Consultation Paper

6 May 2021

Contents

Introduction

1. Electra Limited (Electra) welcomes the opportunity to submit on the Electricity Authority's, *Battery energy storage systems offering instantaneous reserve,* Consultation Paper, 8 April 2021 (the EA's Consultation Paper). Nothing in this submission is confidential.
2. Overall, we agree with the intent of the EA's Consultation Paper. Amending the Code to allow grid-scale battery energy storage systems (BESS) to provide instantaneous reserve in the wholesale market is appropriate.
3. However, we ask the EA to consider the following recommendations when making its final decision:
   (i) define the term 'grid-scale' BESS, and
   (ii) give more time to the consultation on the aggregation of small, distributed BESS than it has this consultation.
4. Included in Appendix A are our answers to the EA's Consultation Paper questions in the EAs preferred format.
5. The primary contact for this submission is—

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Define the term grid-scale BESS

6. The term 'grid-scale' is not defined in the EA's Consultation Paper. There are several generalised statements, including—

> 'A grid-scale battery energy storage system (BESS) consists of large batteries connected to transmission or distribution networks through inverters and transformers.'[1]

And

> 'While we use the term "grid-scale" to refer to the size of batteries focussed on in this consultation paper, the size and location of BESSs across the network will become increasingly blurred.'[2]

7. Defining the term grid-scale would add clarity and reduce the blurriness of the participation of BESS in the instantaneous reserves market.
8. As we understand it, grid-scale BESS consists of a series of banked batteries (i.e., linked in a series) connected to the electrical power grid at a single point.
9. We believe that it is reasonable that grid-scale BESS has an export capacity of 1MW or more at a single injection point.
10. Accordingly, we recommend that the EA specify that BESS participating in the instantaneous reserve market must be grid-scale and define grid-scale as having an export capacity of 1MW or more at a single injection point.

[1] Electricity Authority's, Battery energy storage systems offering instantaneous reserve, Consultation Paper, 8 April 2021 (the EA's Consultation Paper), Executive summary, the top of page iii.
[2] Supra n1, Executive summary, the bottom of page iii.

Give more time to the consultation on the aggregation of small, distributed BESS

11. There are several statements made in the EA's Consultation Paper that the proposal is an intermediate step to enabling the aggregation of small, distributed BESS, including—

> '…the Code amendment proposed in this consultation paper seeks only to enable BESSs to act as an additional type of fast or sustained instantaneous reserve, with minimal complexity. A subsequent, wider review will investigate the future needs of the system in relation to system stability and how these needs could be met by the full range of services provided by technologies such as BESS.'[3]
>
> 'We expect that BESSs will rapidly find valuable application at all levels in the power system, from the grid to distribution networks, and embedded within consumer premises.'[4]
>
> 'We are actively engaged with the system operator to scope the next stage of work that will develop provisions for reliable, coordinated and secure operation of inverter-connected distributed energy resources, enabling aggregations of smaller distributed BESSs as potential providers of ancillary service.[5]

And

> 'The Code amendment proposal in this consultation paper will lay the groundwork for participation of all network-connected batteries.'[6]

And

> 'The proposal is intended to be an intermediate step towards a future more comprehensive integration of BESSs – and other inverter-connected devices – into the wholesale market, at all levels in the power system.'[7]
>
> 'The proposal lays the groundwork for the more comprehensive developments expected to come that will lead to battery resources participating in energy and ancillary service markets to their full potential.'[8]

12. We are not opposed to distributed generation connecting to our network. Small, distributed BESS, i.e., residential battery storage, is growing and is welcomed. However, we believe if small, distributed BESS is to participate effectively and appropriately in the electricity market the changes to the Code will require comprehensive deliberation.

13. We are concerned that the EA may be flagging its intention in this consultation as a means to reduce the consultation time for the amendments needed to enable small, distributed BESS participation in the instantaneous reserves market.

14. Rushed changes to the Code could have unexpected material impacts on the New Zealand electricity industry that are not in the long-term best interests of consumers.

15. Accordingly, we recommend that the EA give significantly more time to the consultation for the participation of small, distributed BESS in the instantaneous reserves market than it has this consultation of only four weeks.

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3 Supra n1, Executive summary, page iii.
4 Ibid n3
5 Ibid n3.
6 Supra n1, paragraph 2.37, page 11.
7 Supra n1, paragraph 3.3, page 13.
8 Supra n1, paragraph 3.31, page 17.

Appendix A — Submission in the EA's preferred format

Question	Comment
Q1. Do you agree the issue identified by the Authority is worthy of attention?	Yes. We are of the view that grid-scale BESS is a viable source of instantaneous reserve.
Q2. Do you agree with the objectives of the proposed Code amendment? If not, why not?	Yes, amending the Code to extend the instantaneous reserve market to include grid-scale BESS is appropriate. However, we are concerned that: (i) the term 'grid-scale' is not defined by the EA; and (ii) the proposal may be used as a sedge way to the participation of small, distributed BESS in the electricity market without allowing the appropriate time for consultation. Accordingly, we have recommended that the EA: (i) define the term 'grid-scale' BESS; and (ii) give significantly more time to the consultation around small, distributed BESS than it has this consultation of only four weeks. We have discussed our recommendations in more detail in paragraphs 6 to 15 of this submission.
Q3. Do you agree the benefit of the proposed amendment outweigh its costs?	Unsure. We neither agree nor disagree with the EA's estimate of a net present value of the proposal of $43.3 million. On the surface, the EA's analysis may have overstated the benefits and unstated the costs. The details of the analysis offered in the EA's Consultation Paper are high level, and the EA did not release its workings in any more detail. However, as we have not done a comprehensive analysis of our own, we cannot quantify our view and, as such, can only state that we are unsure that the benefits of the proposed amendment outweigh its costs.

Q4. 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.	Unsure. It would appear that changing the core specification of FIR and SIR to an option like an 'area under the curve approach'[9] would provide a superior solution to what is being proposed by the EA in this consultation. However, the EA has discounted this option based on cost vs. benefit and timeliness conclusions from its *Review of instantaneous reserve market project*, Decision Paper, 27 March 2018. The basis on which the EA has discounted the option of changing the core specification of FIR and SIR is weak. The cost/benefit analysis is six years old. Further, the option was primarily worked through with WAG and the systems operator and was not formally consulted with stakeholders.[10] Accordingly, we are unsure whether that options are preferable to the amendment being proposed by the EA in this consultation.
Q5. Do you agree the Authority's proposed amendment complies with section 32(1) of the Act?	Yes. We agree that the proposed amendment for grid-scale BESS will not materially affect the efficient operation of the electricity industry. However, we are concerned that the EA's intention to use this amendment as an intermediate step towards a future with more comprehensive integration of small, distributed BESS has the potential to materially affect the efficient operation of the electricity industry (i.e., not comply with s32(1)(c) of the Act[11]). Our concern is that the EA may be flagging its intention in this consultation as a means to reduce the consultation time for the amendments needed to enable small, distributed BESS participation in the instantaneous reserves market. The amendments to the Code to accommodate small, distributed BESS must be comprehensively considered by the EA and stakeholders. Accordingly, we recommend that the EA give significantly more time to the consultation around small, distributed BESS than it has this consultation of only four weeks. We have discussed our recommendation in more detail in paragraphs 11 to 15 of this submission.

9 Supra n1, paragraph 3.29(a), at page 16.

10 '…stakeholders were able to provide informal feedback via an industry teleconference held on 26 August 2015…'. Electricity Authority, Review of instantaneous reserve market project, Decision Paper, 27 March 2018, paragraph 3.7, at page 6.

11 Electricity Industry Act 2010.

Q6. Do you have any comments on the drafting of the proposed Code amendment?	We are concerned by the definition of generation reserve covering all forms of injectable reserve, including— 'any future form of injectable reserve not covered by (i) or (ii)'[12] While we appreciate the EA's attempt to make the Code future-looking and technology agnostic, the context of this proposal has been grid-scale BESS and not an unknown future technology. We are uncomfortable that the proposed amendment could be interpreted as our support for the participation of future technologies in the instantaneous reserves market without the EA undertaking due process through consultation at that time.
Q7. Do you have any comments on the drafting of the proposed procurement plan amendment?	We note that: • clause B32.1.2.1 excludes BESS from participating as fast instantaneous reserve, and • clause B32.1.2.2 excludes BESS from participating as sustained instantaneous reserve. The amendment appears to be at odds with the EA's observation that— 'When charging, BESSs act like load and are able to provide [interruptible load] by interrupting or reducing the power being used to charge the battery.'[13] And with the EA's intention to— 'Updating the definitions of fast instantaneous reserve and sustained instantaneous reserve: the definitions of fast instantaneous reserve and sustained instantaneous reserve would be updated to account for the changes in (a) to (c) above.'[14]

[12] Supra n1, paragraph 3.2, at page 12.
[13] Supra n1, paragraph 2.20, at page 9.
[14] Supra n1, paragraph 3.2(f), at page 12.