Powerlink Queensland

Summary of Project Assessment Draft Report

24 October 2022

Managing voltages in South East Queensland

Summary

An increase in the uptake of roof top solar systems and more efficient energy devices within South East Queensland requires Powerlink to take action

Declining minimum flows and an increasing capacitive contribution from more energy efficient appliances and roof top solar systems in the South East Queensland (SEQ) area are increasing the likelihood of non-compliant over-voltage events. The current strategy of switching out selected feeders to ensure ongoing compliance with the National Electricity Rules (the Rules) "voltage of supply at a connection point"[1] requirements, is at the limit of its technical effectiveness. Continued reliance on increasingly onerous reconfigurations of the network will result in higher market costs, reduced system resilience and compromised system security, hence this is not an effective and sustainable strategy.

Consequently, there is an identified need for reliability corrective action that Powerlink must address to ensure operational safety, reliability and that service standards continue to be met.

On 17 December 2021, AEMO declared a Network Support and Control Ancillary Services (NSCAS) gap in southern Queensland. Powerlink issued an Expression of Interest (EOI) on 19 May 2022 requesting additional system security services to address this gap prior to 2023. This RIT-T is looking at longer-term solutions that can be delivered to ensure compliance with voltage management obligations going forward, while minimising costs incurred from addressing the identified need.

Developments since the start of this RIT-T have changed the timing and extent of investment needed and provide more scope for non-network options

This Project Assessment Draft Report (PADR) reflects the second step in the RIT-T process, and follows the publication of the Project Specification Consultation Report (PSCR) on 30 July 2021.

At the time of publishing the PSCR, Powerlink had intended to adopt the expedited process for this RIT-T, which allow for exemption from the PADR stage. However, there have been a number of developments since the PSCR was published, which impact both the extent and timing of the voltage management issues which form the identified need for this RIT-T, as well as the potential solutions to addressing the identified need. In particular:

- a 200MW Battery Energy Storage System (BESS) at Greenbank approaching committed project status and an early works agreement with the 1,026MW MacIntyre Wind Precinct – the presence of each of these projects will provide reactive support which will assist with voltage management in the SEQ area;
- a change in the Rules that will require all generators and BESS to provide reactive power services as part of the automatic access standards from June 2024; and
- various market-led connection enquires for BESS in the SEQ area over the medium to longer term.

Overall these developments change the timing and extent of the identified need for investment in the SEQ network, and also provide potential proponents for network support arrangements that may prove a more flexible and fit-for-purpose solution than additional network investment. Consequently, Powerlink is publishing this PADR to update stakeholders on the identified need for this investment and to facilitate further engagement with prospective proponents of non-network options (NNO).

Two submissions for non-network solutions were received in response to the PSCR

One confidential submission was received to the PSCR that closed on 29 October 2021. However, this submission was later withdrawn by the proponent. The remaining submission was received from CleanCo Queensland, the details of which are confidential and under discussion at the time of PADR publication.

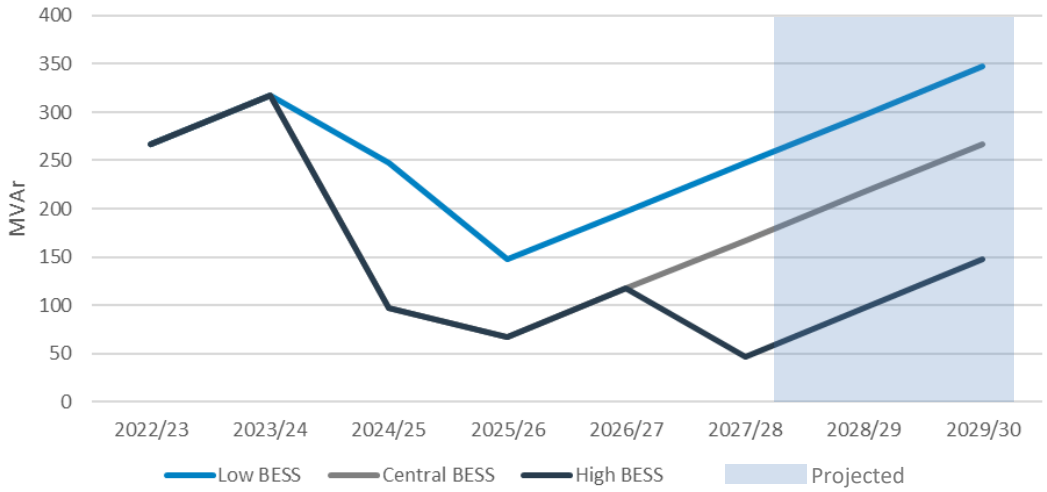
Three options have been considered under three scenarios for future market-led BESS development

[1] [1] NER, Version 188, 29 September 2022, Schedule 5.1a.4 Power frequency voltage

In order to reflect uncertainty around future market-led BESS development, Powerlink has developed scenarios reflecting different levels and timing for future BESS developments.

Figure 1 shows the forecast shortfall in reactive power absorption capability in the SEQ area, under these three scenarios. Under a High BESS scenario, more BESS units are assumed to provide reactive power absorption to the network as part of the Rules automatic access standard requirements. Conversely, the Low BESS scenario assumes only committed and advanced projects eventuate, limiting reactive power absorption from future BESS projects.

Figure 1 Forecast shortfall in reactive power absorption in SEQ



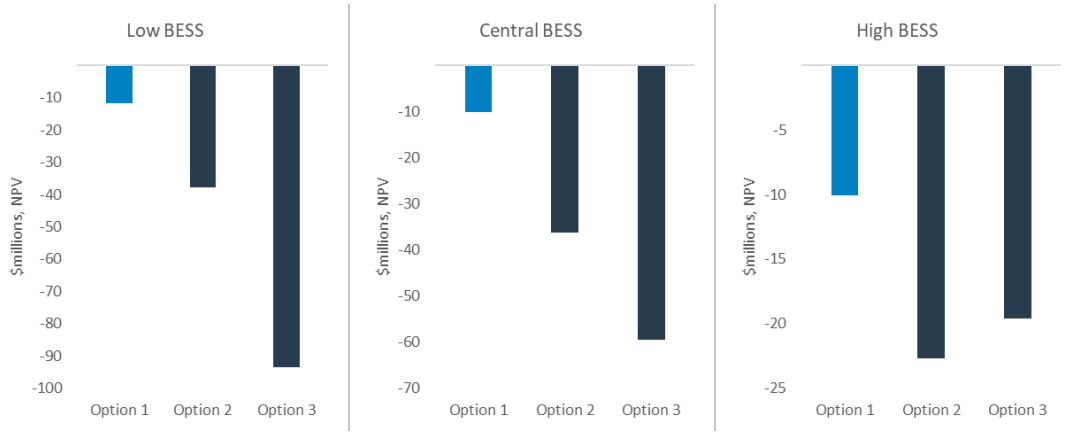
Projected future BESS projects have also allowed consideration of an option that utilises non-network solutions. Powerlink has considered three options in this PADR that all involve a 120MVAr reactor at Belmont to meet the immediate need from 2023/24 onwards, but then approach the identified need with different solutions as voltage issues and reactive power absorption shortfalls evolve.

- Option 1 continues to utilise network support services to address shortfalls capacity for reactive power absorption from either the NSCAS gap network support arrangements and/or BESS units as required.
- Option 2 reflects investment in additional 120MVAr bus reactors in Powerlink's transmission network as required.
- Option 3 involves installing 30MVAr bus reactors in Energex's distribution network as required.

Option 1 has been identified as the preferred network option

Evaluating these options, Option 1 is found to have materially smaller net costs than the other two options under each of the three scenarios and in the weighted scenario relative to the base case. Option 1 minimises costs as it only incurs capital and operating costs for the 120MVAr bus reactor at Belmont and a small amount of fuel costs under the Low BESS scenario for a non-network proponent to provide network support services. Because this option draws on BESS which are expected to enter on a market-led basis, and does not affect the operation of those BESS, there are no additional costs imposed on the market from utilising these non-network solutions. In contrast, Options 2 and 3 involve materially higher capital costs relating to additional reactors, which also attract operating costs.

Figure 2 Net costs under each BESS scenario



Option 1 has therefore been identified as the preferred option. Option 1 involves the installation and commissioning of a 120MVAr bus reactor at Powerlink's Belmont substation for 2023/24, with a capital cost of $13.3 million in 2022/23 prices.

Subsequent to 2023/24, Powerlink would seek to establish network support agreements with non-network option proponents in the SEQ area to meet projected shortfalls in reactive power absorption capability.

Powerlink welcomes submissions to the PADR

Powerlink welcomes submissions from interested stakeholders, including prospective proponents who consider they could offer a non-network solution as part of Option 1.

Lodging a submission with Powerlink

Powerlink is seeking written submissions on this PADR on or before Friday, 9 December 2022.

Please address submissions to:

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