7 May 2020

John Pierce
Chairman
Australian Energy Market Commission

Lodged online: www.aemc.gov.au

Dear Mr Pierce

AEMC: SYSTEM STRENGTH FRAMEWORK DISCSUSSION PAPER

Origin Energy Limited (Origin) welcomes the opportunity to provide comments on the investigation into system strength frameworks discussion paper.

Origin notes that the issues discussed under this review are also being considered under the Energy Security Board's (ESB) NEM 2025 work program. Origin suggests that the AEMC work with the ESB to develop a consolidated approach in addressing issues relating to system security services more broadly.

We do not consider that the existing frameworks are providing efficient outcomes for new entrant generators or consumers. Requiring connecting generators to "do no harm" for system strength has inadvertently increased barriers for new entrants. Additionally, the current requirement for networks to resolve system strength issues once identified by AEMO places cost recovery on consumers, with less oversight on the investment than construction of other network assets.

As such, Origin supports further investigation of a centrally coordinated approach in the identification of system strength requirements. We examine these issues in greater detail below.

The current framework is inefficient and costly

The current framework is based on two elements; the do no harm provision for new generators and a requirement on networks to resolve low system strength issues identified by AEMO. We consider that these two elements are not effectively providing for the provision of system strength in the NEM.

Do no harm framework
The do no harm framework requires new entrant generators to ensure that they do not lead to the worsening of system strength through their connection. In practice, this has mostly resulted in these generators individually constructing synchronous condensers. There is minimal coordination between the new entrants resulting in piecemeal solutions which do not effectively meet the needs of the power system.

Additionally, power systems are complex and multiple new connections interact in ways not covered by any modelling for an individual plant. Even where each generator meets the do no harm requirements, there can still be low system strength caused by the interaction of multiple generators in locations with high renewable penetration.

Identification of low system-strength
Where low system strength is identified by AEMO, it is the responsibility of the network business to resolve. The network business does not need to follow the full RIT-T for this expenditure and could have an incentive to undertake capital work that will increase its regulatory asset base, rather than fully examine non-network solutions.

Origin Energy Limited ABN 30 000 051 696; Level 32, Tower 1, 100 Barangaroo Avenue, Barangaroo, Sydney NSW 2000;
GPO Box 5376, Sydney NSW 2001 • Telephone (02) 8345 5000 • Facsimile (02) 9252 9244 • www.originenergy.com.au

Consideration of options presented in the Discussion Paper

In examining various options for procurement, the AEMC should remain mindful of some of the key characteristics of system strength:

- Provision of system strength is through lumpy investments. This involves the investment in large pieces of new infrastructure, like a synchronous condenser, or the maintenance of an existing asset like a synchronous generator.
- System strength is location specific
- Many of the technologies that supply local system strength, also supply inertia that can be of use globally. The requirements for system strength and inertia should be considered together.

With the above in mind, we discuss the various options below.

Centrally coordinated approach should be further considered
Origin welcomes further consideration of a centrally coordinated approach (such as model 1 outlined by the AEMC) for the provision of system strength. Under this approach a central body such as AEMO could be responsible for identifying areas with potential low system strength which aligns with AEMO's responsibilities under the ISP. AEMO could use the ISP to identify areas where system strength issues are likely to arise given changes in network topography, or the construction of REZs.

A key issue with the existing framework is the lack of visibility that investors have of system strength issues. Without complex modelling, it is difficult for participants to see where system strength issues are likely to arise. Information on the need for system strength across the NEM would influence decisions such as the location of new asynchronous generators.

While the identification of system strength needs could be centralised, clear checks and balances should be in place to ensure the most efficient investment decision is made to resolve any identified system strength requirements.

The provision of system strength to make up a potential shortfall should be open to any participant. There should also be independent verification that the most efficient choice to resolve an identified lack of system strength is being made. We note that in some circumstances the use of existing synchronous generators may be the most efficient way of providing system strength at a location, compared to the construction of new assets such as synchronous condensers.

Providing price signals through dispatch would be difficult
Origin considers that it will be difficult to price system strength into the dispatch system (as described in model 2) in a way that provides for a clear investment signal. One issue with implementing dispatch of system strength is that NEMDE price signals are region dependant (such as an energy price) or NEM wide (such as FCAS). With system strength being locational specific care will need to be taken to ensure that any dispatch price signal matches the need of the system.

Generators should not have additional system strength requirements in their performance standards
Origin does not support the introduction of an active system strength requirement on generators (model 3). We consider that that many of the issues that have occurred under the do no harm framework would eventuate under this approach.

Origin Energy Limited ABN 30 000 051 696; Level 32, Tower 1, 100 Barangaroo Avenue, Barangaroo, Sydney NSW 2000;
GPO Box 5376, Sydney NSW 2001 • Telephone (02) 8345 5000 • Facsimile (02) 9252 9244 • www.originenergy.com.au

Renewable Energy Zones could offer opportunity to trial operation at lower system strength
In the long term an electricity system that operates with lower levels of system strength (as set out in model 4) may be possible.

It may be useful to consider a trial of low system strength operation at remote locations in the NEM. Such a trial would require a regulatory sandbox in a REZ with the following features:

- New entrant asynchronous generators designed to operate with low system strength.
- The generators connected through new network assets constructed with lower fault current requirements.
- Trial to be in a remote physical location, so low system strength does not affect existing assets.

Should you have any questions or wish to discuss this submission further, please contact Alex Fattal via email alex.fattal@originenergy.com.au or phone, on (02) 9375 5640.

Yours sincerely

Steve Reid
Group Manager, Regulatory Policy

Origin Energy Limited ABN 30 000 051 696; Level 32, Tower 1, 100 Barangaroo Avenue, Barangaroo, Sydney NSW 2000;
GPO Box 5376, Sydney NSW 2001 • Telephone (02) 8345 5000 • Facsimile (02) 9252 9244 • www.originenergy.com.au