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6/05/2021

Committee Chair
Mr Ted O'Brien MP
House of Representatives Standing Committee on the Environment and Energy
GPO Box 6021
Canberra, ACT, 2600

Lodged online: www.aph.gov.au/environment

Dear Mr O'Brien MP,

Inquiry into dispatchable energy generation and storage capability in Australia

We are pleased to make a submission on the Standing Committee on Environment and Energy's (**the Committee**) inquiry into dispatchable energy generation and storage capability in Australia.

TransGrid is the operator and manager of the high voltage transmission network connecting electricity generators, distributors and major end users in New South Wales (NSW) and the Australian Capital Territory. Our network is also interconnected to Queensland and Victoria, and is instrumental to an electricity system that allows for interstate energy trading. Our responsibility is to operate and manage the transmission network safely, securely and efficiently in the long-term interests of consumers.

We support the Committee's inquiry to consider the current circumstances, and the future need and potential for dispatchable energy generation and storage capability in Australia. The focus on ensuring there is enough dispatchable energy is important due to increasing intermittent renewable generation in the energy system and the retirement of coal fired power stations that is occurring.

With over 60 years of experience in managing the transmission system in NSW and the ACT, we are keen to assist the Committee in exploring this issue and identifying potential solutions. In this context, this submission sets out our views on key changes to the energy system that we consider are required to provide for a low emissions, low cost and reliable electricity supply that is fit-for-purpose in the changing energy environment.

New transmission investment is required to connect regions and open up large scale renewable energy zones

New transmission investment connecting regions in the National Electricity Market (**NEM**) and opening up large scale renewable energy zones (**REZ**) has a critical role to play in providing a fit for purpose energy system for the future.

In New South Wales alone, over 30 percent of the coal fired generation capacity is expected to retire over the next decade alone. Significant volumes of new generation will be required to maintain energy security during this transition and large scale renewables represent the lowest cost replacement technology. In some regions with strong renewable resources the transmission network is already congested, with new and existing renewable generators at risk of constraints. Additional network capacity will be needed to facilitate the next wave of generation development.

The strategically planned connection of large scale energy zones, supported by greater interconnection will provide consumers with the lowest priced energy and system security.

The benefits include:

- Connection of the lowest-cost generation in regions with the best quality renewable resources. These large scale generators can operate at higher capacity factors and are able to supply electricity to consumers at lower unit costs than generation in lower quality renewable resource areas.
- Efficient transmission connection through economies of scale.
- Geographic diversity of renewables across the National Electricity Market (**NEM**) to provide lowest cost intermittency firming.
- Sharing of energy and ancillary services across regions to provide system security and resilience.

The transmission network provides a platform for the lowest cost electricity generation to be connected and dispatched, enhancing energy market competition.

With this in mind, we commend the work of the Energy Security Board (**ESB**) in delivering rules to action the Integrated System Plan (**ISP**). The ISP, developed by the Australian Energy Market Operator (**AEMO**) is an optimised whole of system plan to provide for the efficient development of the NEM, including interconnectors and REZs in the next 20 years.

In its 2020 ISP, AEMO states:[1]

> *"The transmission grid itself requires targeted augmentation to support the change in generation mix. As long as augmentation costs are kept to an efficient level, strategically placed interconnectors and REZs, coupled with energy storage, will be the most cost-effective way to add capacity and balance variable resources across the whole NEM…*
>
> *If fully implemented with the necessary market reforms, these* [the ISP] *investments will create a modern and efficient energy system that meets the system's reliability and security needs through its transition, and meets existing competition, affordability and emission policies."*

The ISP projects in NSW include Project EnergyConnect (**PEC**), HumeLink and an upgrade to the Victoria New South Wales Interconnector (**VNI**). The delivery of the ISP projects will require an unprecedented level of capital investment and the correct policy and regulatory settings are needed to ensure the private sector can make these investments for the benefit of consumers.

In addition to the ISP projects, we are also working closely with the NSW Government to deliver the Central West Orana REZ as part of the NSW Government's Electricity Infrastructure Roadmap. The Central West Orana REZ is one of a number of REZs to be developed under the NSW Government's Roadmap. These REZs will have a critical role in providing for a low emissions, low cost and reliable electricity supply and we are keen to work with the NSW Government to help it deliver on its objectives.

Grid-scale battery storage is a key part of the solution

Our view is that the roll-out of grid-scale batteries will be an essential means of providing dispatchable energy to consumers as the energy market transitions to cleaner forms of energy.

With the unprecedented levels of renewable generation that will be facilitated in the coming years, there will be consequential system impacts that will need to be carefully planned for and managed. One example will be needing to replace the inertia provided by coal fired power generation but not provided by renewable generation.

In addition to storing and dispatching electricity, storage technology can also efficiently provide energy services required to support the electricity system such as system strength, voltage control and inertia. The required system services solutions resulting from increased intermittent renewable

[1] AEMO, 2020 ISP, July 2020, pp. 13 & 18.

generation should be planned and co-ordinated on a system wide basis to ensure the least possible cost to consumers.

Our view is that system services are most efficiently provided when considered on a whole of network basis due to the highly complex and interdependent nature of the network. The primary transmission network service provider in each NEM region can, and should, provide this service to ensure the security and reliability of the electricity system is maintained.

In support of this approach, the Australian Energy Market Commission (**AEMC**) has recently made a draft rule determination in support of our request to change the National Electricity Rules to provide a whole of network approach to system strength services in the national electricity market (**NEM**). The current generator 'do no harm' approach to system strength has led to high costs and problematic system strength technology such as small synchronous condensers being built.

Innovation and active consideration of new technologies is required to provide more efficient outcomes for consumers

TransGrid actively seeks to apply innovation and new technologies to solve emerging energy system challenges where they represent superior value to consumers. By way of example, we will soon deploy Australia's first Tesla mega pack big battery at Wallgrove in NSW. This project will provide significant insight into how energy storage is able to provide the energy services of the future on a large scale.

We appreciate the opportunity to make this submission. If you would like to discuss this submission, please contact me or [redacted].

Yours sincerely

Eva Hanly
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