AEMC

INFORMATION

Coordination of generation and transmission investment

Stage 2 discussion paper published

The COAG Energy Council requested the Commission undertake a biennial reporting regime on a set of drivers that could impact on future transmission and generation investment. As part of this reporting, the Commission has published a discussion paper that presents the Commission's initial views on three key developments that may necessitate changes to the current transmission framework: likely future congestion on transmission networks as more generators connect to the grid; new types of generation capability – such as large-scale battery storage – connecting directly to the transmission network; and more lower emissions generation such as wind and solar farms entering the market, which may need to locate in areas that are at the edges of the existing network, in new renewable energy zones (REZs).

Current transmission frameworks

The current transmission framework can be broadly described as having the following key features:

- Parties have a right to negotiate a connection to the transmission network, but no right to earn revenue in the wholesale market i.e. there is an open access framework for generators.
- Transmission network service providers (TNSPs) have to meet jurisdictionally-set reliability standards that reflect a trade-off between the cost of building and maintaining the networks and the value placed on reliability by customers, which are defined in terms of serving customer load
- End-use consumers pay for costs incurred by the TNSPs in providing shared transmission services from which they benefit, including the investment and operational costs which are reflected in a TNSP's revenue that is recovered from consumers (known as "transmission use of system charges", or TUOS charges") and which are regulated by the Australian Energy Regulator (AER).
- Generators only pay for the costs of the services provided to them by the TNSPs to facilitate their connection to the transmission network.
- The TNSPs plan the network, which assist s in identifying the solutions to network issues in a timely manner. The Australian Energy Market Operator (AEMO), as national transmission planner, provides an independent, strategic view of the efficient development of the transmission grid.
- Augmentation and replacement decisions relating to the network are subject to cost-benefit tests (regulatory investment tests) to assess whether the investment or replacement will create a net market benefit for consumers.

Coordinating generation and transmission investment

The discussion paper presents the Commission's initial views on three potential areas of current transmission frameworks that may impact on the coordination of generation and transmission investment, congestion, the treatment of storage and renewable energy zones.

Congestion in the NEM

The issue of congestion management has been the subject of ongoing debate since the NEM was established. As there are no firm access rights for generators in the NEM, there is no guarantee that they can export all of their output to the system at a given time.

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There are a number of different design options for renewable energy zones. Each option has different implications for consumers and the regulatory framework.

Quantitative analysis conducted as part of this review has found that there is a limited amount of congestion in the NEM at the moment within regions. Congestion largely occurs. between regions. There is over 45,000MW of proposed generation that has expressed an interest in connecting across the NEM. While all of this generation may not eventuate, to the extent that it does, there could potentially be issues related to congestion in the future. We are interested in stakeholder views on the analysis about the current state of congestion in the NEM, how this might change as the energy transformation occurs, and the potential ways in which this could be addressed.

Treatment of storage

Large-scale storage facilities are already connecting to the NEM. However, there may be some aspects of the current regulatory framework that may need to be harmonised to better facilitate the connection of large amounts of grid-scale storage facilities.

The paper seeks stakeholder feedback on:

- Whether or not storage devices need to pay for use of the transmission network
- How hybrid facilities that combine storage with another generation source are treated for the purposes of registration

Making renewable energy zones work

The Finkel Review examined ways to address the challenge of coordinating transmission planning and renewable generation investment. The Finkel Panel recommended that consideration be given to the development of new renewable energy zones to facilitate the connection of new renewable generators to the transmission network.

As part of this recommendation, AEMO has commenced the development of the Integrated System Plan that it states will deliver a strategic infrastructure development plan that can facilitate an orderly energy system transition under a range of scenarios, including REZs.

It is not immediately obvious what a REZ is, or should be defined as. The Commission considers that there are a number of definitions of REZs, and that these can sit on a spectrum.

The Commission has developed four definitions or types of REZ, which it considers is indicative of a range of options that would sit along this spectrum as summarised in table 1.

The stage 2 discussion paper explores these options in further detail.

Table 1: Range of options for REZs

Option	Option 1: Enhanced information provision	Option 2: Generator coordination	Option 3: TNSP speculation	Option 4: TNSP prescribed service
Features	Enhanced AEMO and TNSP coordinated planning to signal (i.e provide information to market participants) on potential REZs for development by the market	Generators connecting in the same area work together to coordinate the connection process (similar to the SENE process)	TNSPs undertake speculative investment to build the REZ i.e. the investment is not undertake as a prescribed service	TNSPs build infrastructure in anticipation of generators connecting to a REZ, with this being constructed as a prescribed service

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The Commission welcomes stakeholder views on the analysis presented in this report. Submissions are due on 18 May 2018.

Option	Option 1: Enhanced information provision	Option 2: Generator coordination	Option 3: TNSP speculation	Option 4: TNSP prescribed service
Who pays?	Same as now (generators if these are connection services; consumers via TNSPs if the REZ can be justified as a prescribed service)	Generators	TNSPs. If generators connect to these assets in the future then TNSPs would be allowed to roll the infrastructure into the RAB and so consumers would pay for this.	Since these are constructed as a prescribed service, consumers pay for this infrastructure
Who bears the risk?	Same as now (generators and consumers as per the above)	Generators	TNSPs. TNSPs would be rewarded for their increased risk if generators connect to these assets in future.	Consumers - including facing the stranded asset risk
Implications for changes required to the existing framework	Minimal	Minimal - but larger coordination issues exist	Moderate	Substantial

Next steps and timing

The Commission welcomes stakeholder feedback on the analysis presented in this discussion paper. In particular the Commission would like to hear stakeholder views on the potential design options of renewable energy zones and the implications these design options may have on costs, risk allocation and the regulatory framework in the NEM.

The deadline for submissions is **18 May 2018.**

Stakeholder submissions will be a key input into the final report, to be published in mid-2018. The final report will provide more detail on the Commission's views on changes to the regulatory framework that would improve the coordination of generation and transmission investment.

Background

In February 2016, the COAG Energy Council requested that the AEMC implement a biennial regime to report on a series of drivers that could impact future transmission and generation investment, in accordance with a terms of reference and under section 41 of the National Electricity Law.

The terms of reference set out that the AEMC will undertake a two-stage approach to the reporting of conditions that influence transmission and generation investment.

Stage 1 of this review concluded in July 2017 and the Commission recommended that the review progress to stage 2.Three decision criteria were met in making this recommendation. The decision criteria are:

- the drivers of transmission and generation investment have significantly changed since July 2015
- there is expected to be large amounts of transmission and generation investment

- the expected future investment is uncertain in its location and technology.

The drivers of transmission and generation investment have changed significantly since the AEMC was issued with its terms of reference. There is increased uncertainty regarding government emissions reduction policy, this is having ramifications for investor confidence. There is an observed trend of thermal generation exiting the market and being replaced by renewable generation. The take-up of distributed energy resources is expected to continue, with new business models entering the market seeking to maximise the benefits from these resources.

It is expected that there will be significant transmission and generation investment in the future. Increased low emission generation will be needed to reduce the emissions intensity of the generation sector. Renewable generation may potentially locate in areas that are a distance from existing transmission infrastructure. It is therefore likely that the shape of the transmission network will need to change in response to reliably supply consumers.

The location and technology of new investment is uncertain. This is because of uncertainty regarding future emissions reduction policy, the changing generation mix, changing relative technology costs and the potential for new investments to maintain system security.

In August 2017 the Commission published an approach paper that outlined our approach to the second stage of this review. The submissions received in response to the approach paper have been a key input into the stage 2 discussion paper.

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