

18 May 2018

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Australian Energy Market Commission  
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Attention: Therese Grace

## Coordination of generation and transmission investment – Discussion Paper (PR0052)

Energy Networks Australia welcomes the opportunity to lodge this submission in response to the AEMC’s Discussion Paper on its Coordination of generation and transmission investment review<sup>1</sup>.

The Finkel review identified the coordination of generation and transmission as an issue that required particular attention, given the unprecedented transformational changes taking place in the energy sector. In this context, Energy Networks Australia considers that the identification of potential renewable energy zones (REZs)<sup>2</sup> and AEMO’s Integrated System Plan (ISP) are important developments that can improve the coordination of generation and transmission.

Energy Networks Australia notes that while the Discussion Paper is focused on transmission, distribution networks also play a significant role in system security and meeting emissions targets. For example, Energy Queensland currently has 23 committed large-scale solar and wind generators at 1200 MW total connecting to the distribution network, from 7MW to 100MW each, with another dozen currently in serious assessment phases.

Energy Networks Australia’s overriding goal is to ensure that the NEM and its supporting regulatory and planning frameworks are equipped to deliver the best whole-of-system value for consumers, including distributed solutions.

Overall, Energy Networks Australia is concerned that the Discussion Paper does not reason from a viewpoint of the significant changes in energy sourcing in the NEM that are occurring and accordingly understates the extent of the challenges ahead and the need for focused and timely change. Historical congestion analysis, for example, is

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<sup>1</sup> AEMC, Coordination of generation and transmission investment – Discussion Paper, 13 April 2018.

<sup>2</sup> “Renewable energy zones” are defined on page 29 of AEMO’s December 2017 Integrated System Plan Consultation as “areas in the NEM where clusters of large-scale renewable energy can be developed to promote economies of scale in high-resource areas, and capture geographic and technological diversity in renewable resources”.

not a good indicator of these imminent challenges. Our members consider that there is an urgent need for action to ensure that customers continue to receive a reliable electricity supply and that the most efficient whole of system energy solutions are delivered in this rapidly changing environment.

### **Renewable Energy Zones**

The AEMC has indicated a preference for market-based solutions over centrally planned or mandated ones. The Discussion Paper proposes a range of REZ options that sit along this spectrum.

Energy Networks Australia agrees that market-based solutions can deliver innovation and efficiency benefits to consumers if they are underpinned by effective competition. However, as we can see all too readily at present in Australian energy markets, ineffective competition leads to poor consumer outcomes. It is essential that policy-makers focus on likely real-world outcomes for consumers, not theoretical ones.

Using the current arrangements, TNSPs could facilitate all the options canvassed by the AEMC. However, an incremental approach to facilitating renewables is less suited to the current circumstances of transformational change in the energy market. The regulatory framework must therefore support a planned infrastructure development pathway, to operate in parallel with, and to assist in facilitating market-led investments. The type of investments which might be required will be flagged through the ISP which should include robust whole of system technical and economic analysis and identify the least cost outcomes for customers.

Implementation may then be achieved through application of the RIT-T using the assumptions and scenarios contained in the ISP or through other existing or future options identified. It would support effective integrated planning by AEMO and retain the TNSPs' commercial responsibility for network investment and accountability for shared network outcomes.

For many projects, however, the RIT-T will not be well-equipped to respond to these new challenges in a timely manner, nor will it necessarily capture the economy-wide benefits that may be driving the proposed project. These observations point to the need for an alternative cost benefit test to the RIT-T in some circumstances, which may also consider whether alternative mechanisms for charging should apply. In this regard, the regulatory framework should enable governments to facilitate specific transmission investments, as required by the Finkel Panel's recommendation 5.2.

Energy Networks Australia notes, there can be a deep reluctance amongst generators to collaborate on their investment needs. Real experience of the SENE Rule change illustrates this. To promote market-led solutions, the AEMC should consider alternative arrangements for the management of commercially confidential information to promote scale efficient generation and transmission development.

### **ESB Coordination Role**

Energy Networks Australia notes that the COAG Energy Council has very recently (16 April) agreed that the Energy Security Board (ESB) take responsibility for coordinating the work of the energy market bodies on planning and regulation of the

transmission system and interconnection. As the Discussion Paper preceded this decision, the ESB's role and input will be an important consideration as the AEMC moves forward with the present review.

In addition, AEMO's initial ISP will be released in June 2018. The ISP will be informative as to the future generation profile and the associated optimal transmission system development needs. This forward-looking approach will provide the insights needed to confirm the efficient and timely transmission development options to be progressed under the regulatory framework. Energy Networks Australia recommends that the AEMC examines the key messages from the ISP, and implications for the transmission development framework, before determining its findings and directions from this current phase of the review.

If your staff would like to discuss any points raised in this submission, please contact Verity Watson on (02) 6272 1555 or via email at [vwatson@energynetworks.com.au](mailto:vwatson@energynetworks.com.au)

Yours sincerely



Andrew Dillon

Chief Executive Officer

# Energy Networks Australia's submission - Coordination of generation and transmission investment – Discussion Paper

## 1. Introduction

This submission addresses the key issues in the Discussion Paper. It follows the structure of the Discussion Paper, as follows:

- » Section 2 comments on the congestion in the NEM.
- » Section 3 discusses the treatment of storage.
- » Section 4 comments on the options canvassed in relation to Renewable Energy Zones (REZs).

## 2. Congestion

The AEMC's Discussion Paper presents analysis that provides an estimate of the incidence and cost of network congestion that currently exists in the NEM. The purpose of the AEMC's analysis is to estimate the scale of the congestion problem, thereby informing the assessment of regulatory reforms that may be required.

The AEMC concludes that there is currently limited congestion in the NEM. The AEMC notes that to the extent there is congestion, the congestion analysis shows that it is largely limited to interconnectors. The AEMC's analysis is based on modelling by Ernst & Young, which makes a number of simplifying assumptions. In aggregate, Ernst & Young calculates that the costs of congestion were only \$17 million in 2016/17, which is immaterial compared to the total generation costs.

Energy Networks Australia notes that Ernst & Young's analysis is primarily focused on thermal constraints and omits system security and timing considerations with regard to augmentation and replacement expenditure decisions. Furthermore, the extent of sub-regional constraints in some parts of the NEM in NSW, Victoria and north western Tasmania are downplayed. For example, in some regions of New South Wales with high quality renewable resources, TransGrid's network is already 'full' with no spare capacity to connect additional generators. This lack of capacity is resulting in generation projects not being progressed in those areas.

Furthermore, Ernst & Young reports on congestion in 2016/17, rather than assessing future congestion costs. Energy Networks Australia does not support a backward-looking approach. As the network challenges lie ahead, the congestion analysis should also be forward-looking.

Energy Networks Australia considers that a robust analysis of future network congestion should consider:

- » committed and likely future generation developments;
- » TNSPs' asset renewal plans, which are driven by the need to undertake remediation action to address deteriorating asset condition and reliability issues;

- » stability and resilience issues, which have the potential to materialise as constraints and ultimately become a form of congestion; and
- » TNSPs' future responsibility for maintaining system strength, and the implications this may have for thermal constraints.

AEMO has indicated that it will undertake modelling to identify future congestion patterns in the final ISP. Energy Networks Australia supports this further analysis, which will inform the planning process for generators and networks.

It is important to recognise, however, that the challenges facing the electricity sector are much broader than congestion. In NSW, for example, approximately 80% of baseload generation is due to retire in the next 20 years and significant new generation will need to be connected to replace it. An analysis of congestion costs will not capture these issues. Similarly, network issues, such as system strength and resilience, which have been key concerns in South Australia, are not captured in congestion analysis.

In summary, while Ernst & Young's analysis of the historic costs of congestion is interesting, it should not be the only thing considered in any changes needed in the regulatory framework eg. to facilitate REZs. Energy Networks Australia does not regard the historic costs of congestion as providing an indication of the current and future challenges.

### 3. Treatment of Storage

Energy storage is of growing importance in the electricity sector. For example, the Energy Storage for Commercial Renewable Integration (ESCRI) project in South Australia provides market and network-facing benefits, which is an important development in the application of large scale storage. In this context, it is important that the regulatory arrangements regarding storage are properly understood and clarified.

Under the interim AEMO 'Guide to Generator Exemptions and Classification of Generating Units' reissued on 7 July 2017, a grid scale battery, for example, will be required to be registered as a market generator/ scheduled generator and a market customer/ scheduled load in relation to the battery and the associated transmission network connection point.

Essentially, transmission connected storage devices either serve the same function as generators or provide them with auxiliary support. AEMO's dispatch and scheduling arrangements ensure that grid scale storage is centrally dispatched for both generation and charging to ensure that the system operator has appropriate oversight and control of these devices. Under these arrangements, charging of grid scale storage should neither drive augmentation nor adversely affect the provision of exit services to bona fide end use customers.

Energy Networks Australia considers that, under the current transmission pricing arrangements, if transmission connected scale batteries are centrally dispatched and

cannot drive transmission network augmentation, transmission use of system charges should not be levied when the batteries are charging. As the transmission service would fall within the definition of a negotiated transmission service, this outcome could be accommodated by the current Rules<sup>3</sup>.

The above approach recognises that grid scale energy storage load is essentially auxiliary to generation. Therefore, grid scale energy storage should be treated in the same way as a generator, rather than being treated as a load. This outcome is already seen in relation to pumped storage, where the load is auxiliary to hydro generation, as it is wholly dependent on the generation activity. Energy Networks Australia's proposed approach therefore recognises that the primary purpose of the grid-connected energy storage device is to produce rather than to consume energy.

In circumstances where a battery is ancillary to an industrial customer's load, the customer should continue to be charged as a load. In this case, the primary purpose of the battery is to offset the customer's load, rather than to act as a market generator. If used appropriately, the battery will likely reduce the customer's network charges.

While the above arrangements provide a way forward under the current Rules, Energy Networks Australia recognises that charging arrangements for generators may be revised in future – in which case, the charging arrangements for grid scale storage would also need to change. More immediately, however, the registration categories under the Rules should be updated to:

- » provide a new generator auxiliary load category, for example, that is not a transmission customer or network user; and
- » enable a grid scale storage device to be registered as both generator and auxiliary load with both the generator and the load being required to be scheduled.

Energy Networks Australia notes that the updating of registration categories along these lines was flagged in the AEMC's integration of energy storage review and that AEMO is currently reviewing the registration categories to ensure they are fit for purpose in consultation with the AEMC.

The above comments relate specifically to transmission connected storage. Energy Networks Australia makes the following observations with regard to distribution connected storage:

- » A distributor will levy connection charges and use of system charges relating to an energy storage connection on the distribution network in accordance with their approved pricing arrangements.

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<sup>3</sup> Specifically, paragraph (a)(2) of the definition of negotiated transmission service in Chapter 10 of the Rules includes a shared transmission service that exceeds or does not meet the network performance requirements set out in schedule 5.1a or 5.1 as to quality or quantity, which include power transfer capability. This reflects the principle that the charging of a grid connected battery should not drive augmentation of the network, but would be controlled by AEMO through dispatch instructions to manage power flows within the limitations of the network.

- » If energy storage is embedded in the distribution network, it will appear as load at a transmission connection point. It is appropriate that transmission use of system charges should be levied at that connection point in accordance with each TNSP's pricing methodology. The manner in which these transmission charges are recovered by distribution networks in their network tariffs, and ultimately passed on by retailers, is a matter for those businesses.

In the future, it is conceivable that distribution embedded storage may respond to external dispatch instructions and thus exhibit the same properties of transmission connected storage as discussed above. The arrangements for distribution connected storage may need to be reviewed should this eventuate.

## 4. Renewable Energy Zones

Energy Networks Australia is focused on solutions that deliver the best outcome for customers, in accordance with the National Electricity Objective. Our members are acutely aware of the need to ensure that any network investment paid for by end-consumers is prudent and efficient. Equally, the unprecedented transformational changes that are currently underway expose customers to significant risks, if the industry and the regulatory framework do not respond quickly to the challenges ahead.

The need for change is illustrated most clearly by the significant numbers of connection requests for renewable generation and the limited availability of transmission capacity. The Finkel review highlighted that the current arrangements may not be equipped to deal with the pace of change that the industry is experiencing. The system stability issues experienced in South Australia provide further evidence that network issues, including system strength and resilience, are real and immediate.

In light of these challenges, Energy Networks Australia supports active consideration of the development of REZs and AEMO's ISP. Specifically, Energy Networks Australia supports the strategically planned development of large scale energy zones, supported by greater interconnection, where it provides consumers with the lowest priced energy and system security as ageing coal power stations retire from the market.

In its submission to AEMO's ISP consultation paper, Energy Networks Australia highlighted members' concerns that the RIT-T may not be the appropriate test to apply to regulated network investments that may be required as part of the transformation. Energy Networks Australia reiterates these concerns here, as our members want to ensure the timely delivery of efficient network investment that benefits customers.

Specifically, it is important to recognise that the RIT-T was developed for a different set of circumstances, in which incremental transmission investments to meet load growth were subject to a highly prescriptive test and consultation process. In contrast, future transmission investment may be driven by changes in generation,

which are unprecedented in their scale and pace. For many projects, the RIT-T will not be well-equipped to respond to these new challenges in a timely manner, nor will it necessarily capture the economy-wide benefits that may be driving the proposed project.

These observations highlight the potential need to consider development of an alternative cost benefit test to the RIT-T. In cases where the RIT-T can be applied, it should be streamlined and integrated with AEMO's findings in the ISP. However, it must be recognised that a different test may be warranted for some transmission projects to support the transformation to the lower carbon and largely non synchronous generation change.

A key question is how the RIT-T framework and the ISP, including REZs, will operate together. This will involve clarification and coordination of how AEMO's work on the ISP, AER's work on the RIT Guidelines and AEMC's work on this review will be considered together. The attachment to this submission sets out a suggested approach for integration of the RIT-T and ISP. In relation to the co-ordination of the various work streams currently underway, Energy Networks Australia notes that the ESB has a key role to play, as recently indicated by the COAG Energy Council.

In terms of the ISP the broad scenarios used in the ISP are likely to be relevant for subsequent RIT-T applications to regulated investments identified in the ISP. However, specific RIT-Ts may need to include additional scenarios or variants on these scenarios, where relevant for those specific circumstances. Finally, the overall 'strategic development plan' set out in the ISP should inform the base case for subsequent RIT-T assessments of individual components of that plan. Energy Networks Australia understands that AEMO currently envisages that its ISP will identify a common set of developments across scenarios in the 'near term', with developments further into the future varying across the different ISP scenarios.

In relation to the REZ development options canvassed by the Discussion Paper, Energy Networks Australia notes that they cover a spectrum from 'market-based' to 'planned/regulated' network investments. The AEMC has indicated a preference for market-based solutions over centrally planned/regulated or mandated ones. Energy Networks Australia considers that these different types of solutions can be pursued in parallel by ensuring that each is supported by a workable framework that is capable of driving scale efficient and prudent investment decisions. In this sense, it is not necessary nor appropriate to treat the options as mutually exclusive.

Nevertheless, Energy Networks Australia considers that there are important impediments to some of the options canvassed by the AEMC. For example, options that rely on generation coordination are unlikely to lead to significant improvements in terms of timely and scale efficient network investment. This is because generators have strong commercial drivers not to coordinate with prospective rivals and the current confidentiality provisions regarding connections are too limiting for TNSPs to initiate and drive coordination.

The AEMC's Discussion Paper identifies a potential additional solution, which is referred to as a "clustering approach". Under this model, rather than considering



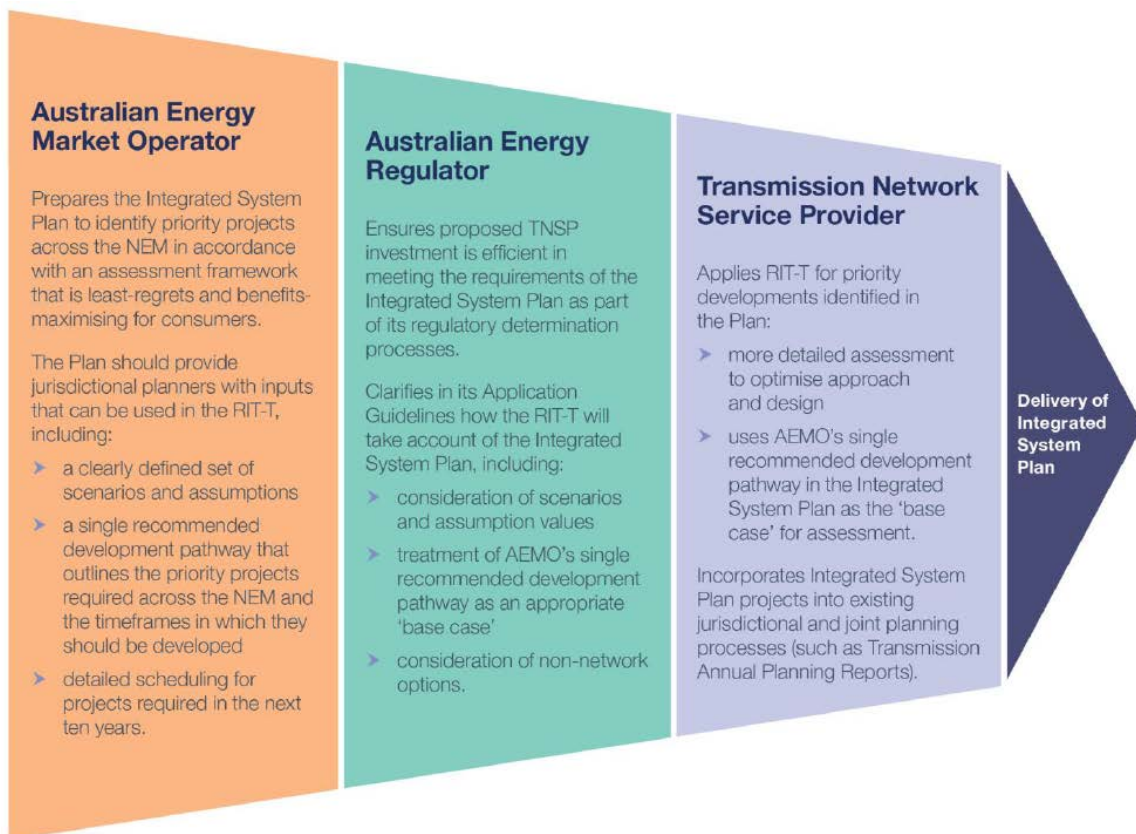
generator connection applications on an ad-hoc basis, TNSPs would coordinate connections, over a defined period, to optimise efficient investment in transmission infrastructure.

Energy Networks Australia does not regard this approach as a stand-alone alternative to the strategic development of REZs. Instead, it is best viewed as an adjunct to existing arrangements that may add value in the connection assessment process. Recent experience shows that non-synchronous generation connections, even in geographically diverse areas, can have system-wide effects. The current sequential approach to processing connection applications under the Rules does not adequately allow for assessment of the impact that multiple large connections can have on each other and other network users.

Accordingly, Energy Networks Australia considers that there would be efficiency benefits if TNSPs were able to co-ordinate and process many connection applications at once, to optimise efficient investment in transmission infrastructure. We acknowledge that there could be further issues to work through with this approach, such as information sharing and application timing windows, but we would support further investigation. More generally, arrangements that allow information to be shared amongst generators may facilitate better coordination, notwithstanding the commercial drivers that tend to undermine scale efficient network investment.

**ATTACHMENT:**

As explained in the covering submission, for transmission projects where the RIT-T can be applied, it should be streamlined and integrated with AEMO’s findings in the ISP. In these cases, the diagram below illustrates how the ISP and the RIT-T would work together to enable the delivery of priority projects that are identified in the ISP as being required to facilitate REZ development.



The above approach was developed by TransGrid and submitted in response to the Australian Energy Regulator’s regulatory investment test application guidelines review issues paper. As noted in Energy Networks Australia’s submission to AEMO on its ISP consultation, changes would need to be made to the RIT-T and / or the RIT-T application guidelines to explicitly recognise that the information contained in the ISP can be adopted directly by the TNSP as input to the RIT-T.