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Via electronic lodgement

Dear John

**Discussion Paper: Coordination of generation and transmission Investment (Ref
EPR0052)**

AusNet Services welcomes the opportunity to make this submission to the Commission's Discussion Paper for its review into the Coordination of Generation and Transmission Investment.

AusNet Services is the owner and operator of the Declared Transmission system in Victoria. Victorian planning arrangements differ from the rest of the NEM in that AEMO is the planner and procurer of shared transmission services and the coordinating TNSP. This separation of planning from ownership and operation results in generation connections in Victoria requiring tripartite arrangements between the proponent, AEMO and AusNet Services. We provide regulated services at the Declared Transmission system interface, and our contestable energy services business provides a range of transmission services.

The electricity sector is facing transformation across all parts of the supply chain. New renewable sources of generation are displacing traditional fossil fuelled generation. How this transformation is managed will have a huge impact on the quality and price customers experience. The Finkel Review found that a more strategic approach is required for the coordination of generation and transmission investment in the NEM, and to ensure security and reliability are maintained. The review identified that planning frameworks need to be capable of facilitating the efficient development and connection of new Renewable Energy Zones (REZs). The conclusion arises from recognising that customers would benefit in two key ways from this coordination:

- Firstly, from more efficient and timely investment in transmission capacity arising from the coordination relative to piecemeal and duplicated capacity created by its lack thereof; and
- Secondly, from the more timely facilitation of increased generation competition and system wide security benefits.

This is an important insight, as the second benefit is potentially far more important to the prices and customers will experience under the transformation underway.

The Commission's review was initiated on the basis of the Commission separately identifying the need for improvement in the coordination of generation and transmission investment. The Discussion Paper recognises the work and recommendations of the Finkel Review and explores options for how investment in relation to Renewable Energy Zones may be treated in the regulatory framework.

AusNet Services presently has approximately 98 generator connections to the Victorian network in negotiation, 64 of which are at the connection enquiry phase and 23 at the application phase, with 11 committed. Our experience from this activity is that transmission limitations are becoming a significant barrier to new generation progressing in prime renewable energy resource areas. The experience is also that competing generators do not collaborate to resolve connection and access deficiencies to meet their joint need, as they have individual and competing commercial interests.

The Finkel Review recommendations for prioritisation of infrastructure development to enable efficient development of REZs across the NEM, based on a NEM-wide integrated grid plan (which AEMO calls an Integrated System Plan - ISP), provide a solution to these issues while avoiding the prospect of over investment in network assets.

The REZ concept is directly associated with the energy source transformation that has commenced. Ultimately, it can be anticipated that new generation proposals will return to demand driven investment economics. In that future environment the REZ would be unlikely to have a major role, and all new investment would be market led. Our conclusion, therefore, is that the regulatory framework should accommodate both market led and system needs led approaches to provide essential infrastructure.

The remainder of our submission supports this approach to overcoming the shortcomings of the current regulatory framework to foster coordinated generation and transmission investment.

1. The Concept of Renewable Energy Zones

In the Consultation Paper, the Commission notes (page 30) that it is focussed on considering the concept of Renewable Energy Zones (REZs) over other options presented when the review commenced, in 2017. AusNet Services agrees with the Commission, that the concept of the REZ should be the priority approach explored and developed to improve investment coordination.

The Consultation Paper explores the definitional aspects of the REZ. It notes that the AEMC does not consider it immediately obvious what a REZ is, or should be defined as (page 53). The term is new, and does need a common understanding of its meaning, to be the subject of framework development discussions. The term appears first in the Finkel Review, and its use and context in the final report from that review serve as the reference point in setting down a meaning.

AEMO, in progressing development of the Integrated System Plan (ISP) has given meaning to this term, and has set this out in its ISP Consultation Paper (Dec 2017). The meaning ascribed by AEMO is helpful in defining a REZ to distinguish this for the purposes of the regulatory framework. We support the meaning for the term REZ set out by AEMO, as consistent with its use in the Finkel Panel final report, and we are not aware that any stakeholders expressed a differing view in response to AEMO's consultation.

AEMO identifies the REZ 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.

An efficiently located REZ can be identified by considering a range of factors, primarily:

- *The quality of its renewable resources (wind or sun).*
- *The cost of developing or augmenting transmission connections to transport the renewable generation produced in the REZ to consumers. (page 5)*

There are a number of aspects of the definition that create challenges that must be treated by the regulatory framework to ensure the most efficient and effective investment. These are:

- Clusters – the energy resource can be geographically identified, and particularly in relation to its proximity to the transmission network.
- Economies of scale, high-resource areas – the focus is on the value of the energy resource to achieve power system objectives, rather than point in time actual development proposals.
- Large-scale renewable energy – the zone incorporates multiple generating farms. Our experience is of multiple generator proponents competing. The scenario is very different to development of a traditional fossil fuel power station, where a single proponent could build an incremental 2000MW power station. A REZ may contain twenty individual farms (at 100MW average) to achieve the same capacity.

Firms compete not just in the energy dispatch process, but in a broad range of areas, such as for incentives (e.g. VRET), prime locations, project finance, first mover use of available network capacity, amongst many factors. In the market environment individual generators cannot be expected to collaborate at the prospect stage when they are competing for energy contracts, access to land and easements, and limited non-firm transmission capacity often concurrently. Market led collaboration also requires aligned timing amongst projects and the firms being sufficiently sophisticated in their understanding of network matters. Even if collaboration did occur, its scope would be commercially limited could not be assumed to be principally focused on facilitating strategic system goals. Again, in our experience, where limited collaboration has occurred in practice, it has been initiated and led by the TNSPs despite there being no formal coordination role.

The Consultation Paper explores various ways in which the REZ concept could be accommodated in the regulatory framework. These can be categorised into 'market led' investment options, and 'system needs led' investment options.

We have previously commented on these two broad approaches, in our submission on the Commission's Approach Paper, observing that a market led approach cannot be effective in the rapidly developing circumstances of energy source transformation, where obtaining scale efficiency in transmission infrastructure is critical to future energy prices for customers. In that submission we observed:

We acknowledge the view expressed by the Commission that it prefers market based solutions to centrally planned or mandated ones, as the alternative risks trade-offs being made between different objectives by governments on behalf of customers (page 13 of the Approach Paper). However, the market led approach is not effective in the circumstances of transition to renewables. The market cannot coordinate to achieve the necessary scale efficient augmentations necessary to connect significant new generation, and in a timely manner. The Finkel Panel recognised this issue, and the quote attributed to the panel in the Approach Paper (page 23) observes that there may be a future role for governments in facilitating considered and targeted investments in network infrastructure to enable the efficient development of renewable energy resources. A key reason for this proposition is the scale and speed of change that is occurring, driven by government policy announcements accelerating the transition to renewable energy sources.

These alternate views need to be reconciled in the Commission's considerations. We can appreciate the arguments associated with both points of view, however it is incumbent on the Commission to develop a framework which, one way or the other, is able to implement large scale investment that will support government transformational policy in the most efficient way, consistent with recommendation 5.1 of the Finkel Panel final report.

The REZ concept is directly associated with the energy source transformation that has commenced. It can be anticipated that new generation proposals will return to demand driven investment economics, and in that future environment the REZ would be unlikely to have a major role, and all new investment would be market led. Our conclusion therefore is that the regulatory framework should accommodate both market led and system needs led approaches to provide essential infrastructure.

The Consultation Paper also discusses the concept and role of energy hubs, and potentially interchangeably with the term REZ. It is therefore worth considering the relationship between the two terms further. This could be clarified in the next phase of the review.

We interpret the hub to be a facility, comprising those assets that provide connection to the shared transmission network at a common location, for multiple renewable energy farms. The assets include Identified User Shared Network Assets.

Whereas the Transmission Connections and Planning Arrangements rule change process considered how sequential development at or behind a connection point would be treated, the hub concept would enable the TNSP to group the connection enquiries where a common connection location would be most efficient. The concept has been the subject of a feasibility study conducted by TransGrid, supported by funding from ARENA and the NSW Government. TransGrid published a knowledge sharing report in June 2016.

In contrast to the energy hub, the infrastructure under consideration for development of the REZ would enable the REZ resource potential to be transported to market, i.e. to access the regional node.

2. Role of the Integrated System Plan

The Finkel Panel's recommendation 5.1 places the Integrated Grid (System) Plan (ISP) at the centre in the Panel's vision for coordination of generation and transmission, in relation to REZs. For completeness we restate the Panel's recommendation:

"By mid-2018, the Australian Energy Market Operator, supported by transmission network service providers and relevant stakeholders, should develop an integrated grid plan to facilitate the efficient development and connection of renewable energy zones across the National Electricity Market". (Recommendation 5.1).

The recommendation has widespread support, including from policy makers. A coordination approach founded on this recommendation is necessary to deliver the most efficient and timely infrastructure to achieve energy sector transformation objectives. As the ISP should therefore become a key facilitator of efficient coordinated investment, it is important that the Commission's review incorporate its role in the regulatory framework.

Currently the ISP has no status in the framework. It performs a different function to the National Transmission Network Development Plan (NTNDP). Specifically, as identified in the Finkel Panel recommendation, its objective is to facilitate the efficient development and connection of REZs. This is not included in the scope of the NTNDP.

The Finkel Panel's final report stated that '*...Planning, particularly for transmission lines, is needed to recognise and respond to emerging trends, provide a clear direction for the system as a whole ...*'.(page 122). Recommendation 5.1 follows from this discussion.

Accordingly, we envisage a regulatory pathway relating to the development of REZs, incorporating the ISP as follows:

- The ISP modelling process identifies REZs, and their likely development based on scenario analysis, and accounting for policy commitments. This would identify network augmentation requirements for generator dispatch.
- The ISP facilitates REZ development based on achieving NEM wide reliability and system security outcomes in the most economically efficient manner. This will take into account the diversity of energy sources and locality, and interconnector augmentation needs and costs for the various options. Government commitments for renewable energy development could also be accounted for in this phase.
- The outcome of this analysis is the most economically efficient, extensively integrated system plan, delivering the lowest cost to consumers for electricity services. It would identify priority infrastructure required to enable REZs which are integral to the plan to flourish.
- Timeliness of investment is crucial to provide market confidence and ensure reliability and security are maintained through orderly mechanisms. These factors all contribute to the most efficient outcome. Accordingly the robust economic analysis and assessment for priority REZ driven infrastructure development must be contained within the ISP analysis.

The alternative of maintaining a separate economic test such as the Regulatory Investment Test for Transmission (RIT-T) would be duplicative for the purpose of REZ developments and this would impact the clarity of investment decision-making and timeliness of investment. In addition, there is concern that as currently scoped in the regulatory framework, the RIT-T may not capture the full range of benefits to consumers from scale efficient augmentation to integrate REZs, and therefore may not replicate the ISP assessment. This prospect would be counter-productive.

3. The Commission's REZ Options

The Commission identifies four regulatory options to improve coordination of generation and transmission, varying aligned to the REZ concept. Option 4, the 'TNSP prescribed service' option, aligns most clearly with the approach we have discussed above.

Options 1 and 2 – market led options

The market led options, Option 1 (enhanced information provision) and Option 2 (Generator Coordination), have merit, in that they place the accountability for location of generation, utilisation of infrastructure, and commercial risk with the proponent. However, both are characterised by focusing on incremental expansion of the REZ to meet the needs of a group of proponents, rather than looking strategically at integrating the energy resource capability of the REZ effectively. This will inevitably lead to loss of scale efficiencies, and result in higher costs for customers through costs on future generators contributing to REZ development.

As discussed in Section 1, there are a number of factors that work against collaboration amongst competing proponents. Our experience is that though it may appear that collaboration on necessary infrastructure to serve their access needs would be in their interest, the evidence is that this is contrary to their individual commercial interests. It cannot be assumed that proponents would cooperate, and especially at the prospect stage, in facilitating the development of scale efficient transmission augmentation to meet the collective needs. Even if those proponents with aligned project timings did collaborate, the outcome would be limited to that group's interests rather than a strategic view to facilitate efficient and effective exploiting of the region's energy resources.

Our conclusion is that the options would not effectively support the need for strategic REZ infrastructure development that would support the transformational change that is required to achieve policy objectives for the future power system.

However, the options have application in a more stable energy environment, for other than strategic REZ development, and they could support the connection needs of generator proponents having aligned project timeframes, i.e., where TNSPs could coordinate connection development applying the energy hub concept (refer section 1).

Option 3 – speculative TNSP investment option

This option depends upon the TNSP investing in an augmentation based on its own assessment of generator uptake. The option does not recognise the work of the ISP in identifying REZs, and prioritised, staged projects that will assure the most efficient infrastructure development across the NEM. The approach is an opportunity driven approach, which may not contribute to the most efficient overall development of the grid.

Such a NEM wide planned approach is necessary for the strategic purpose of REZ development.

Option 4 – ‘System needs’ led augmentation

The Consultation Paper devotes considerable discussion to Option 4, where investment would arise from an efficient power system development plan. As noted above, this is most aligned to the concept of REZ and role of the ISP envisaged by AusNet Services.

This is the only option available that takes a strategic view of the transmission grid’s future needs, where national coordination can be applied to ensure overall network investment efficiency, and which will facilitate energy market efficiency.

We note that it is possible to also consider this option as speculative, since the approach does not have a commercial foundation. However it features a robust whole of system planning approach with the objective of delivering lowest long term electricity prices for consumers in the circumstances of the energy sector transformation.

The discussion in the Consultation Paper raises a number of matters that would need to be explored in detail and in conjunction with the ISP, to manage the risk of stranded assets. They include prioritisation and sequencing of REZs, staging of augmentation, and foundation generator commitment. These are practical risk mitigants that can be explored.

However, the generator connection enquiry activity is unprecedented and potential connection of new renewable resources is severely impacted by network limitations. As discussed earlier, AusNet Services has one hundred connection enquiries in various stages of commitment.

With a robustly developed and critiqued ISP guiding REZ integration into the power system, whatever residual stranded asset risk persists must be considered alongside the considerable benefit of efficient energy supply chain transformation.

The option would not displace other approaches, and the current framework approach, which have application in other circumstances. Accordingly mechanisms would be required in the framework to trigger this option for specific priority infrastructure developments. At its simplest, this could be specified in the ISP, alternatively authorisation via the Energy Security Board could be sought by TNSPs. The key consideration for a trigger is that the investment is deemed to be in the long term interests of consumers.

AusNet Services would welcome further consideration of a project triggering approach options via the next phase of the Commission’s review.

Clustering approach

The Consultation Paper also explores a clustering approach. Our understanding of this approach is that it seeks to join potential proponents into a TNSP led investment assessment. A significant drawback, as for Options 1 and 2, is that it focuses on the needs of a group of proponents, rather than looking strategically at integrating the energy resource capability of the REZ.

4. Analysis of NEM Congestion

The Consultation Paper explores the extent of congestion in the NEM. It concludes that there is limited congestion, and that it is largely limited to inter-regional power flow. Notwithstanding this analysis, the evidence from our generation connections processes shows that significant new renewable generation could not be dispatched to capacity in the north western Victorian REZ.

AEMO, in its role as Victorian transmission network planner, is conducting a RIT-T on the basis of network limitations to support additional renewables generation in this region.

Observed congestion levels would be more relevant to investment signalling for incremental new generation decisions. For consideration of a transformational change in energy sourcing however, the prospective congestion constraining the exploitation of the REZ is the relevant indicator of the need for augmentation.

5. Treatment of Storage

Energy storage systems connected to the transmission system are likely to become an important element in the energy supply chain. The services storage can provide include frequency regulation, reserve capacity, load levelling and peak shaving. The capability of storage systems will become increasingly important as the percentage of intermittent generation on the power system grows.

Performing these energy supply support functions on the power system, storage systems should not attract TUOS charges. We note that these connections can be distinguished from loads, including scheduled loads, as follows:

- they are negotiated transmission services, and the pricing arrangements under Part J of Chapter 6A of the National Electricity Rules (the Rules) would not apply; and
- their services are primarily energy supply chain services provided for the benefit of energy consumers, and are subject to AEMO dispatch control.

Categorisation for provision of energy storage capability services should be applicable equally for standalone storage assets and assets built in conjunction with an intermittent generation project. From a registration perspective, we understand that AEMO is working toward a rule change proposal to clarify the framework for registration of storage under the NER. When a rule change request is submitted, this would provide a good basis for detailed examination and clarification of registration issues.

We note that the arrangements for access and connection charging of batteries established in distribution systems will be separately considered in the Commission's *2018 Electricity Network Economic Regulatory Framework Review* (identified in the Commission's Final Report on the Distribution Market Model, page 62, 22 Aug 2017). We also note that batteries located in the distribution system are currently typically treated as loads, even if they are primarily providing a supply chain function.

6. Concluding Comments

Reform of the regulatory framework is now urgent to facilitate the transformation to renewable energy sources. The Finkel Panel has set out key steps to achieve a coordinated planning and investment approach to facilitate the most efficient and timely outcomes. The Commission's direction for the review should seek to achieve these objectives. Differentiation between this need and mechanisms suited to the more traditional incremental generation new developments appears necessary.

Please contact Kelvin Gebert, our Manager Regulatory Frameworks, if we can assist with any queries in relation to this submission. We look forward to opportunities to provide further input into the AEMC's considerations as the review progresses.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Tom Hallam', written in a cursive style.

Tom Hallam
General Manager Regulation and Network Strategy