Therese Grace
Project Leader
Australian Energy Market Commission
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Coordination of generation transmission and investment

19 September 2017

Dear Ms Grace,

Aurizon is a major Queensland energy consumer that operates a 2,000+ km heavy haulage electric traction rail network. Electricity is supplied predominantly via transmission connections although it also connects to the distribution network. The electric traction network represents a significant proportion of Queensland's total load, as well as the regional load. It provides a critical supply chain link for coal exports from Queensland. This supply chain link must be efficient, reliable and resilient to meet the requirements of coal producers competing in highly competitive global markets. Therefore, any consequences resulting from transmission and generation investment coordination will not only impact Aurizon, but also affect the minerals industry and state government export royalty revenue.

While the network has similar characteristics to a large transmission/distribution network, there are a number of commercial and technical characteristics unique to electric rail. Aurizon is aware of a large number of new generation projects under construction or proposed in regional Queensland. Powerlink is also currently examining the feasibility of a regional energy hub to support significant additional renewable energy investment.

Aurizon supports the objective of the National Electricity Law quoted in the Approach Paper, noting that the objective specifically refers to promoting "efficient investment in, and efficient operation and use of, electricity services". We suggest that this objective should be achieved, to the greatest extent possible, by policy settings that allow businesses investing in both electricity generation and transmission to respond to market signals.

As a major energy consumer, Aurizon notes that the total cost of energy (representing energy, network, and any reliability or security costs) reflects the true cost to consumers. Effective, and efficient coordination of generation and transmission investment has the potential to reduce network and wholesale electricity costs when this is the result of market participants responding to adequate market signals. However, uncoordinated investment and inadequate price signals will drive suboptimal investment resulting in higher energy costs, redundant capacity and

network instability. Such an outcome would disadvantage Australian industry relative to international competitors and reduce Australian economic competitiveness. High infrastructure and wholesale energy prices have put significant pressure on the economic competitiveness of major industries. The impact on energy consumers should be the fundamental priority when determining investment appropriateness.

This submission outlines a number of factors for consideration by the AEMC. We recognise that some of the principles identified may align with the existing regulatory framework and welcome the opportunity to further engage as part of this process.

Response to Approach Paper

For convenience, we have framed our response consistent with the issues for consideration raised in the Approach paper.

Transmission charging arrangements in the NEM

Aurizon is supportive of the AEMC examining the potential for suboptimal investment resulting from limited locational price signals for generators. This is particularly the case in Queensland where vast distances and long transmission grids have been designed in the context of most consumers and generation historically being located in southern Queensland.

A substantial proportion of new generation across Australia, and in Queensland is planned for regional areas due to renewable resource availability. Because generators currently pay shallow connection costs, there is a risk that consequential network investment will be required to transport energy from new regional generators. A mismatch between pricing incentives for generators and existing transmission network operators could result in significantly higher 'true' energy costs for consumers.

For example, the Approach Paper specifically identifies that existing downstream network infrastructure in Queensland is unlikely to support proposed new generation. It states:

"Queensland has nearly 2,500 MW of proposed renewable energy projects in the north of the state. If all of these are built, significant congestion will be faced by these generators, unless the network is augmented in order to reliably supply consumers"

The 2017 Powerlink Transmission and Planning Report (TAPR) shows no load growth in the far north, Ross or Northern regions to support a concentrated level of investment in renewable generation within those regions. The TAPR also flags that the Central West and Gladstone regions are becoming increasingly congested and that additional generation would likely constrain dispatch. Given any excess generation in north Queensland has to flow through the Central West and Gladstone regions, this would require network investment, inefficient dispatch or exit of dispatchable generation from the market. Alternatively, if transmission investment is not sized to reduce congestion at peak times, generators are likely to price in a dispatch risk that could increase the wholesale energy cost and impact consumer prices.

If this is the case, under existing arrangements new generators (and potentially storage) are unlikely to bear the cost of deeper network connection costs. Consequently, higher infrastructure costs will be passed on to energy consumers increasing their cost of energy.

Recommendation: *Transmission charging should consider the direct and indirect costs and benefits associated with new generation and transmission investment. If the total cost of energy*

(representing energy, transmission and security/reliability costs) would increase, then pricing should incentivise more efficient investment.

The options identified by the AEMC are focused on TUOS charges. These charges provide some locational pricing incentives although generators are currently exempt. Consideration should be given to more direct locational price signals to incentivise coordination between generation, transmission and network demand. Many new generators and storage technologies have very different operational characteristics to traditional generators. This has consequences for network design and integration into existing grids that were not originally designed to support significant penetration of intermittent generation. For example, large scale deployment of solar PV in north Queensland may result in seasonal, (and time of day) congestion. Current charging arrangements do not properly capture these impacts or reflect how to optimise transmission investment in the interest of consumers. Consideration should be given to charges that reflect locational characteristics and the timing of network impacts. Such an approach could potentially reduce the total cost of investment (and energy).

Recommendation: *When considering charging arrangements to better coordinate generation and transmission investment, consideration should be given to developing arrangements that reflect the benefits and costs associated with different generator (and storage) technologies. Such an approach may result in more direct geographical price signals, or better reflect the actual (not theoretical) capabilities of transmission, generation and storage technologies.*

The impact on energy consumers should be the fundamental priority when determining investment. High infrastructure and wholesale energy prices have put significant pressure on the economic competitiveness of major regional industries.

Recommendation: *The full cost impact of maintaining a reliable supply to energy consumers should be a fundamental consideration when developing charging arrangements.*

Transmission planning arrangements in the NEM

As technologies and markets change, consideration should be given to ensuring there are adequate market signals to ensure an alignment between transmission and generation investment with *demand*. Three way information flow will allow the improved coordination and efficiency of investment and decision making. New technologies mean generators are more geographically diverse. Consequently, least cost generation and transmission investment is increasingly difficult to test and achieve.

Renewable energy hubs present a range of opportunities to coordinate investment. However, they are also generally facilitated by government intervention. Care should be taken to ensure the intervention does not distort investment and that reliability, security and the true cost of energy are key considerations. Further, network planning should consider future technology flexibility, the generation mix at hubs and the consequential transmission network impacts. Such an approach will help to ensure network capacity is not oversized at particular times due to generator 'peaking' and to minimise costs.

Recommendation: *Network planning should be approached holistically and consider the broader impacts on cost, reliability and security across the network.*

Consideration should be given to more effectively integrating major energy consumers in planning, whether they are current market participants or not. Information exchange may enable

utilisation of sunk consumer infrastructure (or new investment) on the demand side resulting in least cost combination of generation and transmission investment.

Thought should be given to prioritising projects that can benefit from sunk infrastructure where it can provide multiple value streams such as reducing costs, supporting generator investment, increasing network stability, reducing constraints and supporting demand.

Recommendation: *Incorporate existing infrastructure and major consumers into network planning where possible.*

Access arrangements in the NEM

As noted in the Approach Paper, access arrangements are inherently connected to planning and charging arrangements. Due to the geographic diversity of new generators, existing access arrangements can result in deep connection costs that are not borne by generators, but are ultimately paid by consumers.

The AEMC has raised a number of options for consideration. Aurizon notes that many provide investment certainty for new generators, but may not result in least cost outcomes for consumers. When determining the most appropriate future transmission access arrangements, consideration should be given to promoting long term least cost coordinated transmission and generation investment. Lessons should also be sought from international markets where different access arrangements have been used. For example, in Europe firmer access has resulted in preferential dispatch and mismatch between generation cost, and energy + transmission cost which are ultimately passed on to end consumers.

Ensuring future energy reliability and quality

The AEMC is currently undertaking a range of reviews regarding reform to the National Electricity Market. There are also existing and anticipated rule change requests that could result in significant change to the operation of the NEM. It is not clear how this Approach Paper will integrate with those processes.

Recommendation: *When considering how best to coordinate transmission and generation investment, consideration should be given to broader energy market reform.*

Network reliability is a critical issue for Aurizon. Many new generators have different operational characteristics to conventional generators. Significant changes to the electricity generation mix and impact on supply security are currently a priority of the AEMC. The 2017 Electricity Statement of Opportunities released by AEMO highlights the risks to system security and reliability where there is insufficient dispatchable generation (or reserve). This is a critical issue and should be considered as part of optimising investment. We note that investment in new projects should be evaluated on the basis of the total cost to end consumers in a way that specifically considers energy security and reliability. This should include any infrastructure or operational costs associated with network security, reliability and generator dispatchability.

Recommendation: *Cost effective maintenance of network reliability and security should be a key component of transmission and generation investment.*

Conclusion

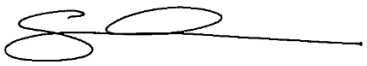
The Australian energy market is rapidly transforming. An aging thermal generation fleet together with new, more geographically diverse generators are changing the market. In planning for the future, care should be taken to ensure that new generation and transmission investment does not distort the market and that reliability, security and the true cost of energy are key considerations. Further, network planning should consider future technology flexibility, the generation mix and downstream transmission network impacts to manage transmission capacity at particular generation times.

Consideration should be given to integrating major regional energy consumers in planning and optimisation of generation and transmission planning. Information exchange may enable utilisation of sunk consumer infrastructure (or new investment) on the demand side resulting in least cost combination of generation and transmission investment.

Achieving the objective of the National Electricity Law to promote efficient investment, operation and use of electricity services will require carefully developed policy settings. We suggest that should be achieved, to the greatest extent possible, by policy settings that allow businesses investing in both electricity generation and transmission to respond to appropriate market signals.

We welcome the opportunity to engage further.

Kind regards,



Steve Straughan
Head of Commercial, Aurizon Network