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Mr John Pierce Chair Australian Energy Market Commission PO Box A2449 Sydney NSW 1235

Lodged online via: www.aemc.gov.au

Dear John,

Coordination of generation and transmission investment implementation – access and charging – consultation paper

TransGrid welcomes the opportunity to respond to the Australian Energy Market Commission's (AEMC) coordination of generation and transmission investment implementation – access and charging consultation paper.

TransGrid is the operator and manager of the high voltage transmission network connecting electricity generators, distributors and major end users in New South Wales and the Australian Capital Territory. TransGrid's network is also interconnected to Queensland and Victoria, and is instrumental to an electricity system that allows for interstate energy trading.

TransGrid is supportive that the AEMC is exploring ways to address issues in the current design of the National Electricity Market and we agree that there is an increasing need to invest in the transmission network to facilitate the energy market transition. We urge the AEMC and other policymakers to work together to implement the changes needed to provide a stable policy and regulatory environment that encourages the required investment.

An integral part of the solution for the AEMC's work is actioning the Integrated System Plan (ISP). TransGrid considers the effective actioning of the Australian Energy Market Operator's (AEMO) ISP will increase capacity on the network and it will address many of the issues that the AEMC has raised. We are open to changes to the current access arrangements which would facilitate the development of Renewable Energy Zones and unlock new connections to the network.

We appreciate the opportunity to comment on this consultation paper and look forward to engaging with the AEMC and other stakeholders further on this important project. If you would like to discuss this submission, please contact Caroline Taylor, Head of Public Policy on 02 9284 3715.

Yours faithfully

Tony Meehan

Executive Manager, Policy & Corporate Affairs

Coordination of generation and transmission investment implementation



Submission to AEMC consultation paper on access and charging

1. Summary

TransGrid welcomes the opportunity to respond to the Australian Energy Market Commission's (AEMC) coordination of generation and transmission investment (COGATI) implementation – access and charging consultation paper. We agree that there is an increasing need to invest in the transmission network to facilitate the energy market transition and urge policymakers to work together to implement the changes needed to provide a stable policy and regulatory environment that encourages the required investment.

TransGrid is the operator and manager of the high voltage transmission network connecting electricity generators, distributors and major end users in New South Wales and the Australian Capital Territory. TransGrid's network is also interconnected to Queensland and Victoria, and is instrumental to an electricity system that allows for interstate energy trading.

Australia is in the midst of an energy transformation. This is primarily driven by changing community expectations and choices, advances in renewable energy technologies, retirement of existing generation, and the adjustments required in Australia's economy to meet our international climate change commitments. These changes raise complex issues in relation to the design of the National Electricity Market (NEM) which must adapt to these changes and provide the basis for low emissions, reliable supply at the lowest cost to consumers over the long run.

TransGrid understands that the AEMC's consultation paper follows and builds on the AEMC's inaugural COGATI review where the AEMC set out a plan to implement access and charging reforms in stages over the next five years. The AEMC also published a supplementary information paper on 4 April 2019 to provide further information and context to stakeholders about the need for access and charging reforms.

The AEMC has concluded that there are limited locational signals for generators and increasing congestion on the network is resulting in disorderly bidding by generators. Following on from this, the AEMC notes there is an increasing need to invest in the transmission network and considers that generators should pay for transmission that is built for their benefit.

To address this concern, the AEMC proposes fundamental changes to the current access regime through a three phased approach:

- 1. Introduce dynamic regional pricing.
- 2. Use information from dynamic regional pricing to improve transmission planning.
- 3. Give generators the ability to fund transmission investment.

TransGrid agrees that there is congestion on the network and that there is an increasing need to invest in the transmission network to facilitate the energy market transition to a lower carbon generation mix.

An integral part of the solution for the AEMC's work is actioning the Integrated System Plan (ISP). TransGrid considers the effective actioning of the Australian Energy Market Operator's (AEMO) ISP, including a fund to underwrite any network expenditure required before regulatory approval, will increase capacity on the network and it will address many of the issues that the AEMC has raised. We are open to changes to the current access arrangements to facilitate the development of Renewable Energy Zones (REZs) and unlock new connections to the network.

We note that, while there is not enough information to comment on the AEMC's proposals in detail at this stage (for example, it is not clear if the AEMC is considering a model relating to financial trading rights or physical trading rights), the AEMC's proposed reforms would represent a fundamental change to the existing access arrangements with significant flow on effects. TransGrid is concerned that the scale and nature of the AEMC's proposed reforms could create policy uncertainty which would slow down or defer time critical and efficient transmission and generation investment including that identified in an ISP. It is critical that this does not occur.



In addition to its proposed solution, TransGrid recommends the AEMC consider other ways of addressing the issues it has raised. All options for access reform should be explored, complete with an appropriate cost-benefit analysis which includes impacts of potential increases in competition. There will be a lot of work to do in delivering any reform – the challenges in resolving the issues should not be underestimated. In addition, any reform should be thoroughly tested before implementation to ensure there is a clear benefit for consumers.

As set out in our submissions to the AEMC's COGATI review last year, TransGrid considers the most effective way to achieve scale efficient generator connections in REZs is for connection assets to be initially funded as a prescribed service until generators pay to connect. We also note the Energy Security Board's (ESB) recommendation for it to examine the possibility of a fund to extend transmission assets to connect REZs with the cost of this transmission progressively recovered from consumers if and when utilisation increases. We would like to explore these options further with the AEMC including how any risks of asset stranding faced by consumers could be addressed.

The AEMC is also considering whether the current approach to inter regional transmission charging is appropriate as part of this review. TransGrid supports consideration of changes to charging for interregional transmission investment which may better allocate the costs of this investment to those consumers which benefit from it. This may involve a more holistic review of the current arrangements rather than considering incremental changes.

Related to this AEMC review, we understand the ESB is undertaking a review considering what the electricity market arrangements should look like post-2025. We note that AEMC is aware that there is an overlap between the ESB's post-2025 work and the access reform proposed in COGATI. We seek further clarity about the link between the AEMC's review of access reforms and the ESB's work and how this will be managed. We also seek further clarity around how the AEMC's work links with the ESB's work on actioning the ISP and its examination of a fund to extend transmission assets to REZs as discussed above. We support the ongoing involvement of the ESB in coordinating transmission related reviews.

This submission sets out TransGrid's views on the issues canvassed by the AEMC, in particular:

- > Chapter 2 sets out our views on the problem being considered by the AEMC.
- > Chapter 3 discusses principles to guide any reform to the current access arrangements in the NEM.
- > Chapter 4 sets out the role of the ISP in solving the issues identified by the AEMC.
- > Chapter 5 sets out our views on the AEMC's proposed reforms to access.
- > Chapter 6 sets out potential alternative solutions that the AEMC should consider in relation to access.
- > Chapter 7 sets out our views on the issues raised by the AEMC in relation to transmission charging.

We have provided our response to the specific questions in the AEMC's consultation paper in Appendix A.

2. The problem of congestion and disorderly bidding

The AEMC has raised a number of other issues that it considers are being experienced as a result of how generators access the network.¹

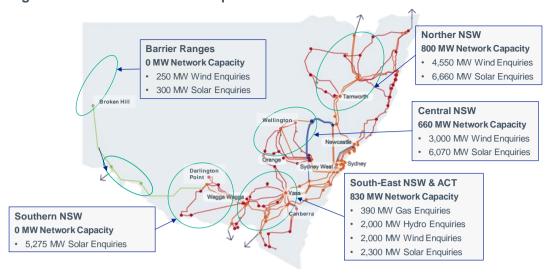
TransGrid agrees that there is currently increasing congestion on the network as the market continues its transformation to a lower carbon generation mix. In the last year, TransGrid connected record levels of renewable generation to the transmission network in NSW, and the level of interest in connecting to the network shows no signs of abating. TransGrid currently has an unprecedented volume of generation connection enquiries, with over 45 GW of potential solar, wind and hydro projects at various stages of development within our network. This growth in generator connections is leading to increasing levels of congestion in parts of the NSW transmission network - most regions with strong renewable resources are already facing network congestion, with new and existing renewable generators at risk of constraints. Similar issues are being seen across the NEM. A summary of connection enquiries to TransGrid by region as at March 2019 is shown in Figure 1.

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¹ AEMC, COGAT/implementation – access and charging, Consultation paper, 1 March 2019, pp. 9-12.

Figure 1 Current connection enquiries to TransGrid network



Congestion on the network generally arises in two ways:

- Solution of the mand of the network reaching its limit of how much power it can transport. This is traditionally how congestion has arisen and, as demand changes are usually incremental, this has been managed through planned prescribed network augmentations.
- » Connection of new generators in a part of the network that has historically been used only for connection of loads. This is the type of congestion that TransGrid is now experiencing.

Current options for the Transmission Network Service Provider (TNSP) to address congestion arising from the connection of new generators are to request the connection proponent to either:

- » Reconsider the size of generation to be connected to be more consistent with the available capacity of the network to which it is connecting, or
- » Consider funding a network augmentation to relieve the network constraint.

As recognised by the AEMC, while there is scope within the NER for generators to fund network augmentation, there is no obligation on the connection proponent to fund augmentation and little incentive for them to do so.² Under the open access regime, no individual generator has preferential access to a shared network asset, even if the generator underwrites the transmission investment. This creates a free-rider problem: each individual generator would prefer for other generators to underwrite transmission investment, to avoid the cost of doing so while enjoying the benefits that the transmission infrastructure provides to all generators. As a consequence of this free-rider problem, shared network assets are typically funded by consumers through transmission use of system (TUOS) charges rather than being funded by a connecting generator.

TransGrid agrees with the AEMC that network congestion could result in disorderly bidding by generators. While we are not aware of disorderly bidding occurring in practice, we note that disorderly bidding could lead to inefficient dispatch costs, which could ultimately result in higher prices for consumers. We therefore support consideration of this issue by the AEMC.

3. Principles for reform

As set out by the AEMC, there is an increasing need to invest in and build transmission as the energy market transitions. It is therefore appropriate to consider the existing NEM frameworks to facilitate improved coordination of generation and transmission investment at this current time.

TransGrid is open to exploring changes to the current access arrangements to facilitate the development of REZs and unlock new connections to the network. Introducing generator firm access could deliver better coordination of generation and transmission investment, ultimately to the benefit of consumers. However,

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AEMC, COGATI implementation – access and charging, Consultation paper, 1 March 2019, p. 11.

there is a need for caution and careful consideration of such a major reform. There are practical limitations of providing firm access on a shared network which will need to be carefully considered and the challenge of resolving the issues should not be under estimated.

In considering any reform to the access arrangements, the AEMC should think about what the market and regulatory arrangements should look like in 10 to 15 years. Critically, any reform should facilitate improved outcomes for consumers consistent with the National Electricity Objective.

We also propose the following principles for any reform to the access arrangements:

- 1. The benefits of any reform must outweigh the costs.
- 2. Any reform must unlock new connections and increase competition in the wholesale market.
- 3. The arrangements should encourage the efficient use of network capacity as a way to reduce overall system costs during the energy transformation.
- 4. Reforms should provide policy certainty to facilitate efficient investment and be supported by generators. It should not slow down the energy transition and deter the current pipeline of generation and transmission investment.
- 5. Reforms should take into account a diverse group of market participants transitional arrangements will need to ensure that stakeholders are treated equitably.
- 6. Adequate time should be allowed to develop, test and implement the reforms.

4. An actioned ISP may remove the need for access reform

We agree that there is an increasing need to invest in the transmission network to support the energy transition. An integral part of the solution is the effective actioning of AEMO's ISP. We expect that an effectively actioned ISP would go some way to addressing the problem identified by the AEMC as it will increase the capacity of the transmission network. We therefore encourage policymakers to work together to deliver on the ESB's ISP Action Plan.

TransGrid considers the ISP can most effectively be achieved by adopting an approach whereby:

- The ISP identifies priority projects across the NEM in accordance with an assessment framework that is least regrets and benefits maximising for customers.
- » The ISP provides an agreed set of inputs, assumptions and scenarios as well as precise and actionable recommendations that can be used by a TNSP.
- The TNSP adopts the inputs, assumptions, scenarios and future NEM pathway in the ISP to undertake more detailed assessments of priority projects identified in the ISP.

We understand that the ESB is to provide to the COAG Energy Council this year any changes required to the National Electricity Law and Rules to embed the ISP into the regulatory framework. We will engage closely with the ESB and other stakeholders in the development of these changes.

5. The AEMC's proposed reforms to access arrangements

The AEMC's consultation paper sets out proposed changes to the current access arrangements in three phases:

- 1. Introduce dynamic regional pricing.
- 2. Use information from dynamic regional pricing to improve transmission planning.
- 3. Give generators the ability to fund transmission investment.

While we are open to exploring changes to the current access arrangements to facilitate REZs and unlock new connections to the network, we are concerned about the scale and nature of the AEMC's proposed reforms. The reforms would represent a fundamental change to the existing open access regime in the NEM which could result in policy uncertainty and slow down or deter the current pipeline of transmission and generation investment.

This section comments on each of the three phases of the AEMC's proposed approach. We consider the phasing of the AEMC's proposed approach to be broadly appropriate. However, the final phase of introducing



generator firm access is by far the most significant and challenging element. The extent of these challenges is not evident from the consultation paper.

Dynamic regional pricing

Disorderly bidding is an outcome that arises as a result of congestion. We consider that disorderly bidding may lead to inefficient dispatch costs, which would ultimately be paid for by consumers. We therefore support the consideration of solutions such as dynamic regional pricing to drive cost reflective bidding and reduce dispatch costs to the benefit of consumers. However, it is difficult to comment on this proposal without further detail on what dynamic regional pricing would mean in practice. It would be helpful if the AEMC could provide an example in another market where this reform has been implemented and has been successful in addressing disorderly bidding.

Dynamic regional pricing may improve locational signals for generation and storage devices, and discourage disorderly bidding. However, it will be important to demonstrate how dynamic regional pricing works in practice, particularly so that market participants have an opportunity to understand the implications of the new arrangements and any unintended consequences can be addressed prior to implementation. For example, it is unclear how constraints beyond simple thermal capacity constraints, such as those related to system security considerations, will be handled within the dynamic regional pricing framework.

We note that dynamic regional pricing does not have a direct price impact on consumers as load customers would still pay the regional reference price.

As set out in Chapter 6, it is important that the AEMC considers other options for addressing the problems it has identified including national locational marginal pricing (or nodal pricing). The AEMC should also consider a model for pricing whereby new connecting generators that cause congestion pay more for congestion than existing generators who have not caused the congestion.

Use information from dynamic regional pricing to improve transmission planning

In addition to addressing disorderly bidding, the AEMC suggests that dynamic regional pricing will promote better transmission planning and investment. We consider dynamic regional pricing may assist transmission planning as an indicator of congestion. However, it is doubtful whether this pricing information will have any impact on the economic assessment of transmission investment options, which is provided by the RIT-T. In particular, the RIT-T considers forward-looking congestion costs in its assessment of the costs and benefits of alternative credible options. As such, historical price information does not have a direct role to play in the RIT-T analysis. TransGrid does not consider dynamic regional pricing will result in significant benefits.

Give generators the ability to fund transmission investment

The final phase of introducing generator firm access is by far the most significant and challenging element.

There is important information missing in the AEMC's proposals to comment on them in detail at this stage. For example, it is not clear whether the AEMC's proposals require transmission networks to provide physical firm access to the network or whether access would be a financial right to the regional reference node price. It is also not clear if the provision of firm access would be a prescribed service or not.

As a starting point, we recommend the following principles for developing an approach which allows for generators to fund transmission investment:

- 1. TNSPs must be remunerated for the provision of firm access, including the risk of financial penalties if service performance falls short of their contractual obligations.
- 2. The transmission charging arrangements for generator firm access must ensure that access is priced appropriately and disputes are avoided by providing a transparent methodology in the Rules for valuing firm access.

Our experience in the Optional Firm Access review conducted by the AEMC indicates that there will be a lot of work to do to implement generator firm access, particularly to allocate risks appropriately and avoid any unintended consequences. We would support a trial or sandboxing approach to limit market impacts and ensure there is a clear benefit to consumers of any change.



6. There are other potential solutions that should be explored

Before embarking on a particular reform pathway, the AEMC should thoroughly consider the full range of options for addressing the problem including:

- » Retain the existing open access arrangements but effectively action the ISP and make changes to marginal loss factors (MLFs) so that they provide an improved locational signal.
- Open access with dynamic regional pricing that is, phases one and two of the AEMC's proposed approach, but not phase three.
- » A model for pricing whereby new connecting generators that cause congestion pay more for congestion than existing generators who have not caused the congestion.
- Senerator reliability standards. TNSPs would have to meet minimum reliability standards for generator use of the transmission network, in a similar way to existing load reliability standards. This would give generators increased transparency and certainty about their level of access to transmission, for which they would pay a charge. The standards would be independently set, with accompanying financial incentives on TNSPs. This would be accompanied by requiring generators to pay a transmission use of system charge.
- » Locational marginal pricing (or nodal pricing). This would be the most significant departure from current NEM arrangements and draws from, but adapts, experience in other international energy markets. Under this model generators would purchase firm transmission rights at auction from a transmission business. Different models of nodal pricing have been used in other countries to price transmission congestion costs (for example, New Zealand and PJM in the United States). We note that the AEMC has expressed concern about nodal pricing splitting liquidity in the contract market. It would be helpful to better understand the AEMC's concerns on this alternative approach.
- » Firm access but without dynamic regional pricing. That is, phases three of the AEMC's proposed approach, but not phase one or two.

As set out in our submissions to the AEMC's COGATI last year, TransGrid considers the most effective way to achieve scale efficient generator connections in REZs is for connection assets to be initially funded as a prescribed service until generators pay to connect. We also note the ESB's recommendation for it to examine the possibility of a fund to extend transmission assets to connect REZs with the cost of this transmission progressively recovered from consumers if and when utilisation increases. We would like to explore these options further with the AEMC including how any risks of asset stranding faced by consumers could be addressed.

7. The AEMC's consideration of changes to charging arrangements

The AEMC states that while the existing inter-regional TUOS (IR-TUOS) arrangements should, over time, adequately ensure that those who benefit from an interconnector pay for that interconnector, given the large amount of interconnectors currently being considered for construction, it is timely to review the IR-TUOS arrangements.

TransGrid considers the AEMC should consider inter-regional TUOS holistically to ensure that customers who pay for interregional transmission investment are those that benefit from it, rather than focusing on incremental changes to the current arrangements.

We support reform of the TUOS arrangements to the extent it is necessary to complement the AEMC's access reforms and the introduction of any new NEM registration category for storage. Whilst we recognise that the current pricing arrangements could be improved, we favour a targeted approach to address specific issues of concern rather than a broader review of the transmission and distribution pricing principles. The timeframes suggested by the AEMC for TUOS reforms are ambitious.



Appendix A – Table of responses to questions posed by the AEMC

Questions posed by the AEMC	TransGrid response
 QUESTION 1: PHASING OF ACCESS REFORMS Is our proposed approach to phasing access reforms appropriate? Are the number and nature of the phases appropriate? How might access reform be phased differently? What interactions with other market design reforms throughout the sector, and the energy transformation more generally, should be considered when developing and assessing transmission access reforms? What should be taken into account when considering how to transition to these new arrangements? 	The final phase of introducing generator firm access is by far the most significant and challenging element. The extent of these challenges including the work required to deliver this reform should not be underestimated. The AEMC's proposed approach would represent a fundamental change to the NEM. It would impact on how transmission networks recover revenue and the way that they plan their network. Depending on the final market design, the introduction of dynamic regional pricing could have a significant impact on existing and future generators. Transitional arrangements should be carefully thought through to ensure a fair and equitable transition for all market participants (current and future) to any new arrangements.
 QUESTION 2: PHASE 1: DYNAMIC REGIONAL PRICING What is the nature of the risk on generators from being settled at the dynamic regional price in the event of congestion? To what extent is this risk different from (and greater or less than) the current risk to generators of being constrained off/down in the event of congestion? What impact may these changing risks have on the contract market, both in terms of products, liquidity, and risks businesses are exposed to? Is generator capacity an appropriate metric on which to allocate the settlement residue which arises from dynamic regional pricing? If not, what alternative metric should be used? Which particular measure of capacity should be used (e.g. nameplate capacity, maximum output in previous X years)? How might the use of capacity or another metric create distorted incentives for generators and/or storage devices? 	It is difficult to comment on this proposal without further detail on what dynamic regional pricing would mean in practice. Dynamic regional pricing may improve locational signals for generation and storage devices, and discourage disorderly bidding. However, it will be important to demonstrate how dynamic regional pricing works in practice, particularly so that market participants have an opportunity to understand the implications of the new arrangements and any unintended consequences can be addressed prior to implementation. For example, it is unclear how constraints beyond simple thermal capacity constraints, such as those related to system security considerations, will be handled within the dynamic regional pricing framework. It is also not clear how generators will bid in this market. The AEMC should also note that the dynamic price could be distorted as it will include the cost of renewable energy certificates for example.
3. Should storage, when importing from the grid, be settled at the dynamic regional price? What might the effects of this be?4. What issues or unintended consequences might arise?	We note that dynamic regional pricing would not have a direct price impact on consumers as load customers would still pay the regional reference price.



5. What are the nature and extent of implementation costs, such as system changes (e.g. settlement reallocations), that would be required to implement phase 1?	
 QUESTION 3: INFORMATION FROM DYNAMIC REGIONAL PRICING What information is likely to be revealed through dynamic regional pricing? How valuable is the information from dynamic regional pricing likely to be in the various transmission planning processes? Will it have other uses? How should the information revealed by dynamic regional pricing be revealed to the market? How might AEMO, TNSPs and the AER integrate the information into their processes? Should the rules be modified to require these parties to take this information into account, and if so, how? 	Dynamic regional pricing may improve locational signals for generation and storage devices, and discourage disorderly bidding. However, it will be important to demonstrate how dynamic regional pricing works in practice, particularly so that market participants have an opportunity to understand the implications of the new arrangements and any unintended consequences can be addressed prior to implementation. For example, it is unclear how constraints beyond simple thermal capacity constraints, such as those related to system security considerations, will be handled within the dynamic regional pricing framework.
QUESTION 4: GENERATORS FUND TRANSMISSION INVESTMENT 1. What issues and considerations should the AEMC take into account when developing and assessing phase 3?	The final phase of introducing generator firm access is by far the most significant and challenging element. The AEMC's proposed approach would represent a fundamental change to the NEM.
	There is important information missing in the AEMC's proposals to comment on them in detail at this stage. For example, it is not clear whether the AEMC's proposals require transmission networks to provide physical firm access to the network or whether access would be a financial right to the regional reference node price. It is also not clear if the provision of firm access would be a prescribed service or not.
	As a starting point, we recommend the following principles for developing an approach which allows for generators to fund transmission investment:
	 TNSPs must be remunerated for the provision of firm access, including the risk of financial penalties if service performance falls short of their contractual obligations. The transmission charging arrangements for generator firm access must ensure that access is priced appropriately and disputes are avoided by providing a transparent methodology in the Rules for valuing firm access.
QUESTION 5: ACCESS REFORM TIMEFRAMES	Our experience in the Optional Firm Access review conducted by the AEMC indicates that there is a lot of work to do and that testing is required to implement



generator firm access, particularly to allocate risks appropriate and avoid any unintended consequences.	
The timeframes suggested for access reforms by the AEMC are ambitious and there is a lot of work to do. We therefore would support a trial or sandboxing approach to test and limit market impacts and ensure there is a clear benefit to consumers of any change before it is implemented.	
TransGrid considers the AEMC should consider inter-regional TUOS holistically to ensure that customers who pay for interregional transmission investment are those that benefit from it, rather than focusing on incremental changes to the current arrangements.	
	We support reform of the TUOS arrangements to the extent it is necessary to complement the AEMC's access reforms and the introduction of any new NEM registration category for storage. We would recommend a targeted approach to address specific issues of concern rather than a broader review of the transmission and distribution pricing principles.

