



21 December 2022

Anna Collyer
Chair
Energy Security Board

Submitted by email: info@esb.org.au

Dear Ms Collyer,

Transmission access reform – Directions Paper

Origin Energy Limited (Origin) welcomes the opportunity to provide comments on the Energy Security Board's (ESB) transmission access reform Directions Paper. A summary of our position on key aspects of this submission is provided below, with further details outlined in Attachment 1.

Origin continues to support evolving the regulatory framework to underpin timely and efficient transmission augmentation and generation investment as the energy sector transitions. Reforms such as renewable energy zones (REZs) and policies aimed at improving social licence directly support the transition in the short to medium term.

The hybrid model proposed by the ESB, including the congestion relief market (CRM), still requires significant work before it can be comprehensively assessed. At this stage, there is some indication that the CRM will be operationally complex and costly to implement.

If the CRM is progressed, it should remain voluntary and more information on how it would work in practice, along with the cost-benefit analysis, should be provided so that stakeholders can assess the proposal in detail prior to the ESB making any recommendations.

In investment timeframes, is it not clear that the two options proposed would provide additionality considering the work being undertaken by the states on REZs and on broader shared network augmentation. These jurisdictional initiatives allow for the coordination of transmission upgrades and send strong locational signals to generators.

If the ESB proceeds with an investment timeframe model, our preference would be to further develop congestion fees rather than priority access. Conceptually, priority access only provides potential efficiency gains through the CRM, while congestion fees would more directly impact locational signals, consistent with the purpose of the reform.

Congestion relief market

The Directions Paper highlight the complexity of implementing the CRM, including some unintended consequences which the ESB should consider further:

- **Addressing arbitrage opportunities:** The paper discusses arbitrage opportunities between the energy market and the CRM, some of which may create disorderly bidding incentives. It would not be appropriate for the introduction of bidding restrictions to be a pre-condition for implementing the CRM and it is unclear what the materiality of the incentives described in the paper would be in practice. It would also not be appropriate to introduce stricter restrictions for storage units – they should be treated the same as generators.
- **Calculation of regional reference price (RRP):** The ESB should first identify if the issue of RRP not converging in the CRM and energy market is material. In addition, setting prices based on the marginal generator in the CRM could require re-opening some contracts and introduce risk for participants who have opted out, to the extent the new RRP differs from the status quo.
- **Settlement of metered output:** Option 1 (settling metered output on RRP) could be more appropriate as generators who have opted out of the CRM should not face local price risk. Option 2 (settling

metered output on locational marginal prices) may lead to unintended consequences, including the need to re-open some contracts due to the change in the settlement formula.

- Rounding of coefficients: This issue should be examined as a separate work program as the problem it aims to solve, winner takes all outcomes resulting from how generators are dispatched when their constraint coefficients are similar, is distinct from core access issues.

Priority access

If the ESB proceeds with priority access, a tiered approach to the queue right would be preferable to unique numbers, particularly if paired with an auction process. Queue rights should be set for the life of the asset and all incumbents should be treated equally and grandfathered fully.

Congestion fees

Generally, the fees should only apply in congested locations, while areas with spare capacity (including those nearing full capacity since it would still be efficient to connect in those areas) and REZs should be exempt. A targeted approach could limit the modelling complexity required to estimate the fee.

The ESB should consider the following if it develops this option further:

- Methodology: Any modelling option chosen is likely to be complex and subject to the inputs and assumptions used. Some flexibility in the methodology would be appropriate as long as this is transparent. The methodology should also capture congestion benefits where these arise.
- Process and timing: The ESB could consider providing a fee range for a particular location that investors could use as a guide, particularly if the enhanced provision reforms are implemented. However, further modelling would be required for each project during the connection process to forecast a more accurate congestion cost and allow for remediation options to be incorporated.
- Use of the fees: The ESB could consider a framework for the fees to be used for upgrading the shared network, either by fully funding the augmentation where practicable or as co-contributions under the existing regulated process. Consumers would benefit through reduced congestion costs while generators would face lower curtailment risks. Existing generators should not be required to pay fees but could opt in to fund an upgrade to reduce any existing curtailment.

Enhanced information provision

We generally support this proposal as additional congestion management information would be useful to investors, though it will be important for any limitations to be clearly set out and understood by all parties. We also support using existing interactive mapping tools as a basis for developing a NEM-wide central portal of information for investors.

If you wish to discuss any aspect of this submission further, please contact Sarah-Jane Derby at Sarah-Jane.Derby@originenergy.com.au or by phone, on (02) 8345 5101.

Yours Sincerely,



Steve Reid
General Manager, Regulatory Policy

Transmission access reform and the hybrid model

Origin continues to support a holistic approach to evolving the transmission framework to meet the changing needs of the market and support decarbonisation of the electricity grid consistent with government policy. The immediate focus should be on ensuring the regulatory framework does not hinder timely and efficient transmission augmentation and generation investment that support the transition. There are several work programs under way to ensure the transmission framework remains fit for purpose, including:

- **Renewable energy zones:** The NSW Government's Electricity Infrastructure Investment Roadmap (NSW Roadmap) implements renewable energy zones (REZs), which coordinates renewable generation investment with network upgrades. Victoria and Queensland are also implementing REZs in their respective regions, and we understand that Tasmania is considering a similar policy. These jurisdictional initiatives allow for the coordination of transmission upgrades and send strong locational signals to generators.
- **Efficient shared network augmentation:** The NSW Roadmap also recognises the need to efficiently upgrade parts of the shared network to support the delivery of renewable generation to NSW consumers and several augmentation projects have been identified. Queensland has also announced similar upgrades to the broader shared network, while AEMO's Integrated System Plan identifies strategic network projects that are optimal to the system.
- **Social licence and benefit sharing:** The AEMC has recommended that the AER should provide additional guidance to clarify the arrangements that support TNSPs in carrying out activities that build and maintain community acceptance of major transmission projects. The NSW Government has also recently introduced a Strategic Benefit Payments Scheme to landowners affected by transmission build over their properties. Improving how the regulatory framework manages social licence is critical to ensure that transmission projects proceed in a timely manner.
- **Economic assessment process:** The AEMC is currently examining potential changes to the regulatory investment test for transmission (RIT-T) to support timely and efficient transmission investment. Origin considers there is scope for changes that could appropriately balance timeliness and rigour of the RIT-T and supports exploring these further.

The policies and programmes above will have a positive impact on supporting the transition in the short to medium term as they directly address the critical issues facing the energy sector with respect to efficient and timely investment in transmission.

Any access reform model will take time to design, test and implement. In particular, Origin is concerned that the operational timeframe model, the congestion relief market (CRM), still requires significant design and testing before it can be appropriately assessed. There is some indication at this stage that the CRM may be complex to implement. The intricacies of introducing an additional market to manage congestion would create significant changes to existing arrangements that will need to be understood. It is difficult to understand the quantum of costs associated with this reform, including system changes, without the benefit of having examined the cost-benefit analysis, which we understand is underway.

If the CRM is progressed, it should remain voluntary. As a general principle, this means that generators who do not opt into CRM should not be exposed to system change requirements, locational marginal pricing or other types of basis risk compared to the status quo. In addition, the cost-benefit analysis should be published so that stakeholders can assess the proposal in detail. Prior to finalising any decisions or recommendations on progressing the CRM further, the ESB should:

- Provide a detailed overview of how the CRM would work in practice, including all the dispatch engine and other technical changes that would be required to implement it. This should help to determine

whether the CRM can work alongside the energy market co-optimised with frequency control ancillary services (FCAS) and other potential markets such as the operational security mechanism (OSM).

- Include, through its public consultation processes, worked examples of how the energy market and CRM would clear when:
 - market participants opt out either entirely or in some dispatch intervals, including at different levels of participation;
 - there are generators behind a constraint but there are no storage units or load to alleviate the constraint;
 - there are incentives for unconstrained generators to participate in the CRM (and set out what those benefits are); and
 - there is interconnection in the NEM, including potentially looped interconnection.

As for the investment timeframe aspects of access reform, is it not clear that they would have any additionality considering the work being undertaken by the states on both REZs and in some regions, on broader shared network augmentation as well, which send strong locational signals to generators. Even in the absence of these REZs, generators face strong financial incentives to not locate in congested areas as curtailment would make their projects uneconomic.

If the ESB proceeds with a model, our preference would be for further developing the congestion fee proposal rather than priority access. Conceptually, priority access would make dispatch less efficient and only provides potential efficiency gains through the CRM, while congestion fees would more directly impact locational signals, consistent with the purpose of the reform. As with the CRM, more detailed information and further design of the ESB’s preferred investment timeframe model are needed before any recommendations for implementation can be made.

The remainder of this submission provides further detail on Origin’s preliminary views on each component of the hybrid model.

Congestion relief market (CRM)

We are concerned that the early stages of designing the CRM have revealed some unintended consequences and implementation complexity as raised in Table 1 below for the ESB’s consideration.

Table 1: Origin’s comments on CRM design options

Design option	Preliminary OE views
<p>Alternative distributions of congestion risk in the energy market</p> <p>What is your preferred option and why?</p>	<p>Origin understands that the key issue being addressed through rounding is ‘winner takes all’ outcomes, which the ESB considers to be inefficient.</p> <p>Origin does not have a firm view on the options as it is not clear:</p> <ul style="list-style-type: none"> ▪ How significant this issue is, both in terms of wealth transfers and impact on inefficient investment or operational decisions. ▪ What the rationale is for rounding and whether doing so to 1 or 2 d.p. addresses winner takes all without any unintended impact on the intent of the coefficient themselves, i.e., could rounding lead to less inefficient outcomes if generators with higher coefficients (before rounding) are dispatched too often. <p>Origin re-iterates that the ESB should, if the issue is material, examine options to address ‘winner takes all’ outcomes as a separate work</p>

	<p>program. It is a distinct, niche issue with how the dispatch engine works and could be assessed separately from core access issues.</p>
<p>Arbitrage opportunities between the energy market and CRM for out-of-merit generators</p> <p>Treatment of storage acting as a generator and as a load</p> <p>Do you have a preferred design choice (either standalone, or combination of options) and what is your rationale?</p>	<p>Option 3 for out-of-merit generators (exclude if CRM bid > regional reference price (RRP)) would represent a significant change to market participants bid. Similarly, Option 2 would introduce bidding restrictions through AER guidelines.</p> <p>It would not be appropriate for the introduction of bidding restrictions to be a pre-condition for implementing the CRM:</p> <ul style="list-style-type: none"> ▪ This design option is being examined to address a potential issue with the proposed market design change, not an existing problem with access, adding to the complexity of this model. ▪ The magnitude of the bidding incentives described in the paper is not clear. The ESB should set out how significant they expect these incentives to be in practice. <p>In addition, the paper proposes additional restrictions for storage units (e.g. Option 2 for storage acting as a generator involves excluding bids if energy bids > assigned strike price). Storage should be treated the same as generators without any distinct or additional obligations, consistent with a technological neutral approach.</p>
<p>Calculation of RRP</p> <p>Do you have a preferred calculation for RRP and why?</p> <p>If the technical implementation plan requires that we adopt your non-preferred calculation of RRP and FCAS prices, what are the risks?</p>	<p>Origin understands that there is no core or revenue adequacy issue with using RRP_{NEM}. However, this could lead to basis risk for some generators if the RRP_s in the CRM and energy market do not converge despite arbitrage opportunities.</p> <p>More information is needed to assess the options; but Origin notes the following:</p> <ul style="list-style-type: none"> ▪ It is not clear if this issue is material. The ESB should provide more information on the likelihood of the RRP_s converging. ▪ RRP_{CRM} may lead to the need to re-open contracts. While contracts are based on RRP_s, it is under the understanding that these would be set in the energy market, not a CRM. This could trigger re-opening clauses for some contracts especially if the RRP_s diverge. ▪ RRP_{NEM} would maintain the status quo of with respect to how energy is priced and would make it easier for all generators to avoid basis risk. RRP_{CRM} on the other hand would mean that generators who opt out would face price separation risk when the RRP_s diverge which is inconsistent with the purpose of making the CRM voluntary. <p>Origin is also concerned by the question on the risks participants would face if the choice of RRP is made based on a technical requirement. While we understand this may sometimes be required (e.g., to ensure secure dispatch when co-optimising energy and CRM with FCAS), the ESB should then assess whether the CRM is still effective if too many design choices need to be made for technical rather than efficiency reasons.</p>

<p>Settlement of metered output</p> <p>Do you have a preferred settlement formula and why?</p>	<p>As noted, generators who opt out of the CRM should not face LMP risk, even on differences between metered output and G_{NEM} (dispatch targets). The purpose of a voluntary mechanism is to give participants the choice of fully opting in or out of this risk. This suggests Option 1 (settle metered output based on RRP) is more appropriate.</p> <p>We understand that the financial risk itself may be relatively small as it would be limited to the deviation amount when $G_{metered} >$ dispatch targets rather than the entire quantity dispatched. However, despite this, settling metered output at LMP could require some financial contracts to be re-opened if settlement formulas used to calculate generator revenue are changed to LMP. This would be a sub-optimal outcome – contracts should not need to be re-opened due to a change in settlement formulas or to settle dispatch deviations when the concept of RRP is being preserved in the energy market particularly for generators who have opted out of the CRM.</p> <p>In addition, settling metered output at LMP (Option 2) when $G_{metered} <$ G_{NEM} could have peculiar outcomes in some circumstances. For example, if $G_{metered} <$ G_{NEM} due to auxiliary load, a generator would be paid $(RRP - LMP) \times (G_{NEM} - G_{metered})$ for consuming its own load, which is inconsistent with the auxiliary load concept. It is also not clear how this additional revenue would be funded. The ESB should set out more detailed information on how settlement would work so that stakeholders can provide more informed feedback.</p>
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Priority access

Priority access as a standalone proposal appears to undermine a core access reform objective – dispatch efficiency. Without the CRM, priority access would arguably make dispatch less efficient and disconnected from generator cost. Priority access appears to only provide potential efficiency gains through the CRM, not the investment timeframe model itself. In addition, despite being an investment timeframe model, the signal itself would only come into effect in real time, making it a less effective siting incentive than a more direct signal in investment timeframes. It would also create additional complexity in dispatch given the additional NEMDE changes required.

Notwithstanding our views above, we make the following comments on some of the design options:

- Form of the queue right: A tiered approach is preferable. It is likely to be easier to implement than unique numbers and would still confer a level of curtailment certainty, if that is the aim of this proposal.
- Allocation mechanism: First come, first served appears to be inefficient and may lead to a rush of projects trying to connect first, which could create issues for connections. Auctions would be preferable.
- Duration of rights: Queue positions should be set for the life of the participant's asset.
- Treatment of incumbents: Incumbents should be grandfathered for locational decisions they have made and cannot change. Origin is concerned with the proposal in the Directions Paper that some existing generators (e.g., fossil fuel generators) would not receive grandfathered rights and would instead need to purchase them in an auction; and would be placed at the back of the queue if they

are outbid. It is not clear what the rationale for this proposal is or whether there would be unintended consequences, such as if a coal plant with minimum generation requirements is constrained off due to an unfavourable queue number. All existing generators should be treated equally and not be required to purchase queue rights.

Congestion fees

Origin prefers further development of the congestion fees proposal over priority access if the ESB proceeds with an investment timeframe model. Congestion fees are a more direct method of strengthening locational signals and may be designed to target problem areas only. The fee should only apply in areas with the greatest congestion concerns (i.e., already congested areas), while areas with spare capacity or nearing full capacity should not face any fees since it would still be efficient for generators to connect in these locations. There should be no fees when connecting to a REZ, including to existing network infrastructure within the geographical boundary of the zone.

While congestion fees are simple conceptually, the design choices that will underpin the model are complex and require additional development. In doing so, the ESB should consider our comments on the options set out in Table 2.

Table 2: Origin’s views on design options for congestion fees

Design option	Preliminary OE views
<p>Method used to calculate fees</p> <p>Which of the proposed metrics do stakeholders consider should be used as the basis for calculating congestion fees? Are there alternative metrics the ESB should consider?</p>	<p>The first two metrics appear most appropriate, while long-run incremental cost may be too burdensome to implement. We make the following comments on the first two options:</p> <ul style="list-style-type: none"> ▪ Option 1: The paper notes that LMP would be based on a cost-reflective dispatch model. It is not clear how RRP would be forecast. In any case, the inputs and assumptions that underpin the forecasts could significantly affect the size of the fee and lead to peculiar outcomes at times due to modelling quirks. Cost-reflective bidding would also not fully replicate actual bidding behaviour and the complexities of managing portfolios, which would limit the accuracy of the fee. However, this would need to be balanced against the additional modelling burden that would be required to model strategic bidding, which may not be appropriate for setting congestion fees. ▪ Option 2: This relies heavily on the Integrated System Plan (ISP) as a central planner, with fees not applying if a generator is deemed to connect consistent with the plan. The ISP is a planning document used for guidance and is not intended to have “teeth” if private investors do not follow it. It is not clear if this option would require a re-design of the purpose of ISP. And as with Option 1, the inputs and assumptions will be a limitation on the outcomes of the modelling. <p>Given this, some flexibility in the methodology may be appropriate as long as this is transparent, to ensure the fees are set in accordance with their intent (efficient locational decisions).</p> <p>The methodology should also capture the benefits of market participants who alleviate constraints or propose remediation options as part of their projects, such as through storage/hybrid systems.</p>

<p>Fee calculation process Noting the trade-off between investor clarity and accuracy, do stakeholders have feedback on how bespoke the modelling should be?</p> <p>Timing At what time within the connection process should the queue position or congestion fee be locked in?</p>	<p>Bespoke modelling may be necessary to determine how each project contributes to congestion. We acknowledge that this is likely to be burdensome and this should be considered when assessing the net benefits of this proposal.</p> <p>To provide investor clarity, the ESB could consider a process where a relevant fee setting body provides a range for the congestion fee at particular locations as a guide. This could build on the enhanced information provision limb of the reform.</p> <p>However, each proponent would then negotiate and finalise the fee with the local transmission network service provider (TNSP) at connection time. At connection application, the proponent may enter into discussions with the TNSP to better understand where in the range the project would sit, with the fee finalised before the connection agreement is signed based on bespoke constraint coefficient modelling and any negotiations made with the TNSP, such as for remediation options.</p>
<p>Options to reduce congestion impact</p> <p>Should the ESB develop proposals to give generators options to reduce their congestion impact (in return for a lower fee) as part of its congestion management reform package? If so, what options should be included?</p>	<p>We support the development of proposals that give generators options to reduce their congestion impact, including through adding storage to their project or to fund incremental investment in the shared transmission network.</p> <p>The ESB should consider the following options:</p> <ul style="list-style-type: none"> ▪ In principle, the congestion fees could be pooled, including if batching of generators is implemented, to fully fund network upgrades in some instances. However, noting that upgrades are often lumpy and full funding may not be practicable, the fees could also be used as a generator co-contribution to the network upgrade through a regulated process (i.e., whereby consumers only pay for part of the upgrades and generators fund the rest through a RIT-T with net benefits). Origin understands this is currently possible under existing rules but is often difficult to achieve without the coordination of generators. ▪ There may be a role for AEMO or the TNSP to play in coordinating generator fees for upgrades, including existing constrained generators that may wish to opt in to reduce any current curtailment level through network augmentation. This would be on a voluntary basis only as incumbents should be grandfathered in full. Generators would benefit from improved access while consumers would gain from lower congestion costs.
<p>Governance</p> <p>Do stakeholders support the proposed governance arrangements for providing locational signals?</p>	<p>The governance approach whereby AEMO sets out the forecast methodology and each TNSP calculates it for proponents connecting to their network is appropriate.</p> <p>The local TNSP is best placed to assess the congestion impact of projects, any remediation options and potential for network upgrades on its network.</p>

Enhanced information provision

Additional congestion management information would be useful to investors, though it will be important for any limitations to be clearly set out and understood by all parties. For example, it would be appropriate to only include thermal constraints in the hosting capacity assessment given that access reform relates to congestion. In practice however, both thermal and other (e.g., stability) constraints lead to curtailment. To be comprehensive and practical, it may be appropriate to provide hosting capacity values with and without non-thermal constraints.

Similarly, it may be useful to report hosting capacity using committed and existing transmission projects only, and also inclusive of anticipated transmission projects. Developers may then choose to make their own investment decisions based on their risk assessment of whether anticipated transmission projects will proceed, as they currently do under the status quo.

We also support using existing interactive mapping tools as a basis for developing a NEM-wide central portal of information for investors.