



26 May 2023

Anna Collyer
Chair
Energy Security Board

Submitted by email: info@esb.org.au

Dear Ms Collyer,

Transmission access reform – Consultation Paper

Origin Energy Limited (Origin) welcomes the opportunity to provide comments on the Energy Security Board's (ESB) transmission access reform Consultation 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 reforms aimed at evolving the transmission framework to assist the transition. There is already work under way to address the critical and immediate challenges, such as implementing renewable energy zones (REZs), improving the connections process, and managing social licence issues. These work programs should remain a priority. Enhanced information provision should also be progressed as a matter of priority. More granular information on congestion will be a useful additional tool for investors as they make locational decisions.

The latest access reform proposal has some advantages over previous iterations, such as design decisions around grandfathering for priority access and the voluntary nature of the congestion relief market (CRM). However, the hybrid model remains operationally complex and technically challenging. It is unclear if the model can be introduced without significant complexity and implementation costs or without making difficult trade-offs that undermine the access objectives. In short:

- Priority access fundamentally changes how the energy market is dispatched. In doing so, it introduces dispatch inefficiency and then relies on the CRM to minimise this sub-optimal outcome. In our view, this complexity is not proportionate to the model's aim of incrementally changing investment signals, nor is it necessary given other work under way, such as REZs and enhanced information provision. Origin does not support the priority access model.
- With respect to the CRM, we remain concerned about the operational and technical complexity of the model, and the proposal to introduce bidding restrictions. These issues will need to be addressed before a final decision is made.

Priority access

In addition to our comments above, Origin has several concerns with the model which we consider could undermine its effectiveness, create new risks that offset the hedge provided by the dispatch priority level and dampen investment signals:

- Priority access would create dispatch inefficiency and is dependent on the CRM to unwind this. It is not clear how liquid the CRM would need to be to ensure efficient outcomes can be achieved. There is a risk that the model could reduce efficiency at certain levels of CRM participation.
- The objective of priority access to improve investment efficiency and provide a hedge against cannibalisation risk will likely only be achieved through harder or firmer access. However, this would result in dispatch inefficiency and could lead to unintended consequences, such as insecure dispatch or changes to the regional reference price (RRP). To address this, a softer approach may be needed, implying less firm access and a return of dispatch priority towards the status quo. This would defeat the purpose of introducing the model. It is unclear if these trade-offs can be resolved.
- Currently, investors incorporate future congestion risk when making siting decisions. While priority access aims to help manage this risk, it also introduces new uncertainties, such as the need to

project CRM outcomes before making an investment decision. New entrants would also need to incorporate the risk or expectation of lack of liquidity in the CRM, which could be particularly problematic for those that rely on it for firmer access.

- Priority access may also be technically challenging to implement. For example, it remains unclear what the impact on the dispatch engine and on RRP's would be of introducing different market floor prices for priority access, including when paired with the CRM.

If the proposal is progressed as a recommended option, the ESB should clarify the interdependence between the CRM and priority access and what it means for the model's effectiveness and for the access objectives. The model's design should include grandfathering for the life of the asset since legacy participants cannot relocate. To promote investment, it should ensure access is on the firmer end of the spectrum and that priority levels are allocated for the life of the asset for new entrants.

Congestion relief market

If the CRM is progressed, it should remain voluntary so that generators can manage risk and make commercial decisions around participation. We therefore support the design choices that are consistent with this principle, such as retaining the RRP as set in the energy market. We support exploring options that support greater participation in the CRM with the ability to manage exposure such as the proposed buy-sell spread. However, these should be balanced against system change costs if new bidding structures are introduced.

We remain concerned about some aspects of the design options and on implementation issues:

- We re-iterate that that it would not be appropriate for the introduction of bidding restrictions to be a pre-condition for implementing the CRM.
- More information is needed on how the CRM will work with priority access and how the dispatch engine will handle solving for ancillary services, particularly with global settlement in place. Given the additional complexity involved, it is unclear if the dispatch engine would solve in time.

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

Yours sincerely,



Sarah-Jane Derby
Energy Regulation Manager

Priority transmission challenges

Origin continues to support evolving the transmission planning and investment framework to meet the changing needs of the market and support decarbonisation of the electricity grid consistent with government policy. The immediate focus should remain on removing barriers to timely and efficient transmission and generation investment.

Transmission project delays caused by global supply chain challenges and social licence issues; delays in the connections process; and the ongoing tension in coordinating generation investment with efficient augmentation remain immediate concerns. Reforms aimed at addressing these issues should continue to be prioritised by all market bodies, including:

- Jurisdictional policies such as the NSW Government's Electricity Infrastructure Investment Roadmap (NSW Roadmap) which implements renewable energy zones (REZs), or programs aimed at identifying broader efficient shared network augmentation.
- The connections reform initiative, aimed at improving the processes used by generators when connecting to grid to support timely investment.
- The AEMC's transmission planning and investment review, which recommends a raft of incremental changes to facilitate timely transmission build and address social licence challenges.
- Recognising the risks of transmission project delays in planning timeframes, such as through including lead time delays in the Integrated System Plan (ISP).

The ESB is also, separately, working on enhancing congestion information available to the market when making investment decisions ("enhanced information provision"). As noted in our December 2022 submission, we support this proposal as it would provide investors with better information to help manage congestion risks, particularly as variable renewable energy (VRE) penetration increases. Enhanced information, particularly more granular information on transmission capacity, line flows and constraints, would help generators make better locational decisions through improved modelling capability. These changes could be implemented relatively quickly and should be progressed as a matter of priority.

Transmission access reform – the hybrid model

The ESB's broader transmission access reform work program focuses on managing congestion risks and costs in investment and operational timeframes. The Consultation Paper recognises that access reform, including the proposed hybrid model, is likely to take many years to implement, and as such is not an immediate or short-term solution.

The hybrid model proposed in the Consultation Paper has some advantages over previous iterations:

- It includes grandfathering, which is appropriate for any major regulatory change that affect decisions that cannot be changed (such as where to locate); and
- All participants will have the option to manage their exposure to locational marginal pricing given that the congestion relief market (CRM) is voluntary.

However, there are indications that the hybrid model will be operationally complex and technically challenging. We note that the AEMC recently changed direction on the proposed Operational Security Mechanism, concluding that it would be costly and complex to implement.¹ It remains unclear whether

¹ AEMC, Update on the direction for the Operational Security Mechanism rule change, <https://aemc.gov.au/sites/default/files/2023-05/Forward%20direction%20note.pdf>

the hybrid model can be implemented without significant costs, or the need to make trade-offs that would undermine the ESB's access objectives.

Specifically, Origin does not support priority access:

- The primary rationale for priority access is to improve locational signals. At a high level, we remain of the view that the NEM has strong locational signals supported by jurisdictional REZs. Investment signals will be further improved once enhanced information on congestion is available. We do not consider that priority access is necessary given other work under way to bolster investment signals.
- Priority access would allocate a priority level at connection, effectively locking in a generator's access at that point in time. This access right would then be given effect in real time when bids are tied at the floor price, by dispatching the energy market based on priority levels. This introduces inefficiency as dispatch will be based on when a generator connected, rather than the physical attributes of the system (e.g., constraint coefficients, which dispatch generators based on their contribution to the constraint). This then necessitates trading in the CRM to unwind this effect so that the access objectives can be met. In our view, such a significant change to the access regime and to how the market clears is not proportionate to the model's aim of incrementally changing locational signals to improve investment efficiency.

With respect to the CRM, we remain concerned about the operational complexity and technical challenges of the model, which will need to be resolved before any implementation decision is made.

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

Priority access – model overview

Origin has several concerns with the proposed priority access model which it considers could undermine the model's effectiveness, create new risks that offset the hedge provided by the dispatch priority level and dampen investment signals above and beyond that intended by the proposal.

The implications of the interdependence between priority access and the CRM are not clear

The Consultation Paper acknowledges that priority access would lead to a rise in dispatch inefficiency compared to the status quo if it is not paired with the CRM. As noted above, this occurs because, when prices are tied at the floor, dispatch would be based on an arbitrary measure (when a generator connected) rather than an efficient one (such as a constraint coefficient). CRM trading undoes this as priority levels would not apply in that market and it would also settle at the local price, unlike in the energy market.

However, the interdependence between priority access and the CRM is not explored in the Consultation Paper in detail. Specifically, it is not clear how liquid the CRM would need to be to ensure efficient outcomes can be achieved. Given that the CRM is voluntary, it might be difficult to project what participation levels will be if it is implemented. As a result, it is not clear how the ESB will be satisfied, if priority access is recommended, that it will not worsen dispatch efficiency overall.

It is unclear how firm the dispatch priority level will be in practice

The Consultation Paper notes that "hard" priority, whereby the dispatch priority level always takes precedence over constraint coefficients when bids are price-tied at the floor, is not possible in practice. It instead proposes a spectrum between "hard" and "soft" priority, which involve some difficult trade-offs:

- Harder priority would mean firmer access, which is consistent with the intent of the proposal in terms of providing a congestion risk hedge. However:

- It is likely that priority on the harder side of the spectrum would lead to sub-optimal dispatch outcomes. Because constraint coefficients would be bypassed, in general, lower output would be dispatched from behind constraints compared to the status quo. The drop in output would need to be met by other generators in the NEM. The implications of this are not clear but there could be unintended consequences as acknowledged in the Consultation Paper. For example, hard priority could at times lead to higher regional reference prices (RRPs) if met by a higher-cost generator in the bid stack, or at other times, dispatch may not be secure if energy cannot be met elsewhere.
- Harder priority would also mean heavily relying on the CRM to achieve dispatch efficiency – as noted above, it is unclear how high participation levels in the CRM would need to be for this objective to be satisfied.
- Softer priority would address the unintended consequences noted above and minimise the dispatch inefficiency introduced by the priority levels without heavy reliance on the CRM. In doing so, however, it would provide less firm access and revert priority levels back towards the status quo.

Given the potential consequences of a harder approach, such as the need for more output to be generated elsewhere in the NEM, the potential impact on the RRP and on the security of dispatch, there is some indication that a softer approach may need to be chosen for practical and technical, rather than policy reasons, which would erode firmness of the dispatch priority level and the purpose of the model.

This would be a sub-optimal outcome. The model aims to provide more efficient investment signals by locking in cannibalisation risk. The dispatch priority level therefore needs to be firm/hard, i.e., the intent of the model itself is to provide firmer priority. Any dilution of the firmness of the priority level towards a softer approach will have implications for existing generators and investors alike. If access is not firm, the value provided will be eroded, leading to less effective grandfathering in practice. The same rationale applies to new entrants. New generators in effect have their access 'grandfathered' when they connect in relation to future entrants. If dispatch priority is not firm, the value provided by the hedge will be eroded.

In fact, it would not make sense to introduce the model at all if priority levels are on the softer end of the spectrum since it would be similar to retaining the status quo but at a huge implementation cost. At the same time, harder priority, necessary for firm access, would lead to reliance on the CRM for efficiency and other unintended consequences. It is unclear if these trade-offs can be resolved.

Priority access would introduce new uncertainty for investors

Under the open access regime, investors make commercial decisions on where to locate based on several factors, including by projecting future access/cannibalisation risk. The Consultation Paper notes that the model would help investors manage this risk by locking in access. However, the solution itself introduces other types of risk which may offset this.

In effect, priority access may be replacing one risk with another. Instead of projecting future congestion risk, investors would need to incorporate likely future CRM participation levels and trading outcomes, which would be difficult to forecast, adding to the uncertainty of making investment decisions. One option to manage this risk would be to only make investment decisions based on the energy market (i.e., choosing to opt out of the CRM). However, this would be a sub-optimal outcome from an access objective point of view since the proposal relies on CRM participation to improve dispatch efficiency. It is also unlikely, from a commercial perspective, that an investor would ignore the potential trades from the CRM.

Under the hybrid model, some generators with poor access in the energy market could improve their curtailment risk and therefore financial outcomes in the CRM. In many locations where there are good

wind and solar resources, new entrants may need to rely on the CRM for access since efficient oversubscription (congestion) is likely to be a feature of the market in those areas. In other words, access may be poor in the energy market but could be high enough through CRM trading to justify the investment. There is additional risk for those generators if the CRM is not liquid as they would experience poor access. In some instances, it may lead to inefficient investment signals because of an expectation of illiquid trading or uncertainty about the outcomes of the CRM.

Priority access may be technically challenging to implement

The ESB proposes to give effect to priority access through different market floor prices (MFP) for each dispatch priority level. It is unclear what the impact on the computational requirements and time to clear the market would be at this stage. It is also unclear what the impact on the RRP would be, e.g., if a node with a lower MFP is marginal. For example, it is not clear if the RRP would be set by the original/true price (-\$1,000/MWh) or the allocated MFP, or if an additional override would be needed to reflect the original/true price. These issues further highlight the complexity of the model.

Priority access – design options

If priority access is progressed as a recommended option, the concerns above will need to be addressed. In that case, the ESB should be clearer on the interdependence between the CRM and priority access, and set out the implications of this for the design choices and the effectiveness of the hybrid model. As an example, the ESB should be satisfied that priority access can meet the access objectives at all levels of CRM participation.

We also provide comments in Table 1 below on the design options set out in the Consultation Paper for the ESB’s consideration.

Table 1: Design options for priority access

Design option	Preliminary OE views
Allocating priority access (queues or tiers)	Origin does not have a strong preference for either option. As with many design features of this model, the choice may be made based on trade-offs between technical considerations, efficiency, and simplicity. For example, individual queue numbers may not be practical for NEMDE, as noted in the Consultation Paper, but are simpler as a concept.
Degree of priority (hard or soft priority)	The objective of priority access to improve investment efficiency and provide a hedge against cannibalisation risk will likely only be achieved through firmer access, and hard priority is our preference in principle. However, this would result in dispatch inefficiency and could lead to unintended consequences, as noted in the previous section. In our view, if softer priority needs to be chosen for system security reasons or to avoid unintended consequences such as dispatch inefficiency or higher price outcomes, then it is not clear what the rationale for introducing priority access would be since it would just replicate the status quo.
Treatment of legacy generators and storage (grandfathering)	Grandfathering should be a pre-condition for the introduction of priority access as existing plant cannot relocate and have already taken advantage of existing locational signals and connected accordingly under open access. Grandfathering should be for the life of the asset and should be technologically neutral.
Duration of priority level	Priority level should reflect the life of the asset, similar to the grandfathering approach. Without this and firm access, investment

	hurdles may not be met. Long-lived access rights have precedent in the NEM, with the NSW approach offering 20-year rights under its access schemes.
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Congestion relief market (CRM)

Origin re-iterates that if the CRM is progressed, either as a standalone option or as part of the hybrid model, it should remain voluntary so that participants can manage their exposure, as the CRM involves a level of basis risk due to being settled at the local price. 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. To that end:

- We welcome the design choices made since the Directions Paper was published in relation to how the RRP is calculated and how metered output is settled. These choices are consistent with the intent for the model to allow generators to voluntarily choose their level of exposure to the CRM.
- We support the option for generators that have opted into the CRM to further manage their exposure by “opting out” of certain dispatch intervals consistent with their risk strategies. We support exploring additional options for generators to further participate in the CRM while managing risk exposure such as the proposed buy-sell spread. However, this will need to be balanced against system change/implementation costs if new bidding structures are introduced.

We remain concerned about some aspects of the CRM design and implementation challenges. We set out these concerns below for the ESB to consider.

Arbitrage opportunities between the energy market and CRM for out-of-merit generators.

We welcome the decision to treat storage the same as generators for this design feature. However, we re-iterate that it would not be appropriate for the introduction of bidding restrictions to be a pre-condition for implementing the CRM. 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. We re-iterate that the ESB should set out how significant they expect these incentives to be in practice before any decision is made on restricting bidding.

Operational complexity and implementation challenges

It remains unclear how the CRM would work with priority access and how the dispatch engine would handle solving for frequency control ancillary services (FCAS) in both markets, with global settlements in place and in time for every five-minute interval.

Generally, there are still significant implementation or detailed design features to be worked through – it is not yet clear if the CRM alone or with priority access can be implemented from a purely practical perspective, and if so, at what cost. These issues will need to be worked through before any final decision on implementation is made.