8 November 2019

John Pierce
Chairman
Australian Energy Market Commission

Lodged online: www.aemc.gov.au

AEMC: COORDINATION OF GENERATION AND TRANSMISSION INVESTMENT (COGATI) DISCUSSION PAPER – PROPOSED ACCESS MODEL

Origin Energy Limited (Origin) welcomes the opportunity to provide feedback to the AEMC on the COGATI discussion paper on its proposed access model.

Origin cannot support the proposed model at this stage. We are concerned that the model would add additional risk and uncertainty in the market, above and beyond existing levels. This would manifest itself in higher system costs and dampened investment signals.

Overall, we think that the design is inherently complex. Dynamic regional pricing would see participants managing investment and operational decisions based on more than 600 local nodes, compared to just five nodes at present.[1] The introduction of dynamic loss factors would see losses changing every five minutes, rather than annually.

Origin is concerned that the financial transmission rights (FTRs) proposed by the AEMC will not fully hedge against the basis risk introduced through dynamic regional pricing. We are also concerned that the proposal to introduce a volume weighted average price (VWAP) for regional prices may have significant implications for contracting and investment.

Origin does not consider that the AEMC has made the case for its access model and that it is unlikely to do so by December given the extent of work that remains to be done. Therefore, we suggest that the AEMC provides a progress update to the COAG Energy Council in December instead of a final recommendation.

The AEMC could then progress its COGATI work in 2020 including by expanding it to meaningfully examine a full suite of alternative options to address a clearly identified problem. It would give the AEMC time to undertake modelling to identify any net benefits associated with its proposed approach before making any final recommendations, consistent with good regulatory practice.

Should the AEMC recommend its proposed access model, Origin considers that it must do so with a strong implementation and grandfathering plan. The implementation date must be realistic and workable, while grandfathering arrangements must reflect existing generator access levels.

We expand on the above issues in greater detail in the attached submission.

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

[1] Based on the number of load and generation transmission node identifiers.

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Yours sincerely

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It is not clear which problem the proposed model is trying to solve

Origin agrees that the NEM is currently going through a transition. The speed at which new connections are occurring warrant examining whether the access and charging frameworks remain appropriate as we transition away from a small number of large generators to a large number of smaller, more dispersed generation.

There is no denying that the transition has been creating challenges for the grid. The AEMC has identified a number of these challenges, but it remains unclear which of the identified problems it is trying to solve. In Origin's view, the AEMC has also not clearly identified the magnitude of the problems it has raised or examined how existing reforms are likely to affect these.

The AEMC has also stated the main benefits of its proposed model relate to providing efficient locational signals, and a means for generators to manage congestion risk as well as improving dispatch efficiency. However, as shown in Table 1, it is not clear what the magnitude of these benefits are. Furthermore, the AEMC appears to have deviated from its initial objective of seeking to ensure the efficient coordination of generation and transmission investment.

Table 1: Identified issues that the proposed access model seeks to address

Issue	Context	Other work	Comment
Inefficient locational decisions	• Locational signals are implicit through constraints and marginal loss factors (MLFs). • However, some generators are locating in areas with poor transmission.	• Transparency of new projects final rule. • Type A renewable energy zones (REZs).	• The AEMC should be clearer on defining the issue. • Is it a lack of transparency? If so, to what extent would the final rule on transparency help? • Is it due to poor expectations of future MLFs and constraints? • Given that the economic implications of worsening MLFs are significant, the strength of the existing signals may not be the issue.
Bidding unavailable	• The AEMC is concerned around generators in South Australia in particular bidding unavailable during system strength events in order to be directed and receive the 90th percentile price.	• The AEMC's work on interventions (and related rule changes) and system strength. • Five-minute settlement.	• System strength issues (i.e. a lack of price signals for system strength) should be addressed directly. • The suggestion that generators bid unavailable so as to be directed is unfounded and illogical given the opportunity cost and wear tear associated with continual directions.
Race to the floor bidding	• This occurs when generators bid at -$1,000/MWh even if it is below their short run marginal cost (SRMC). • The AEMC says that it is an inefficient way to manage volume	• Five-minute settlement.	• We would welcome any evidence outlining the extent of this problem, resulting from management of congestion. • The market floor price serves a purpose in the NEM – it was designed to allow generators the ability to better manage minimum loads and stop/start decisions, for example.

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	risk due to congestion.		• Not all bidding at the floor is disorderly. It may be more appropriate to examine the appropriateness of the market floor price given the changing generation mix. • Five-minute settlement should minimise disorderly more generally.
Investment uncertainty	• There is general concern that the market is not delivering sufficient investment incentives. • Some investors are concerned around the volatility of MLFs.	• Transmission loss factors (TLF) rule change. • NEM2025.	• The AEMC is currently considering a proposal to move to a less volatile marginal loss factor (MLF) framework to provide more investment certainty. • This seems to be in contradiction with the proposal to move to more dynamic MLFs.
Coordination of generation and transmission investment	• The lack of coordination of generation and transmission investment is generally due to commercial tensions and free-rider problems.	• Type B REZ.	• While earlier version of the proposed model did address this issue, it is unclear how the latest version does. • It is also unclear how the proposal for Type B REZs in the second discussion paper published by the AEMC would interact with broader access reform.

Origin understands that the AEMC is also concerned about future intra-regional congestion. We welcome more information on the extent and likely root causes of this problem. Congestion may be caused by inefficient transmission infrastructure investment, inefficient generation locational decisions, or a combination of both, i.e. a lack of coordination of transmission and generation investment. It may be worth considering each of these causes in a targeted manner. For example, inefficient transmission investment may be best addressed through the ESB's work on Actioning the Integrated System Plan (ISP), or through an assessment of the Regulatory Investment Test for Transmission (RIT-T).

Extending the COGATI review into 2020 would also give the AEMC the opportunity to clearly identify the problem and provide evidence of its magnitude. Different problems may require different solutions, and it may be unrealistic that a single model can address all transmission related issues in the market.

For example, if the AEMC is concerned about locational signals, then it could examine options aimed directly at this issue. It should also consider the impact that recent changes would have on the materiality of the problem, e.g. the transparency of new projects final rule should improve locational signals through better information provision.

While Origin is not recommending any specific option, if concerns remain, then the AEMC could examine charging options or consider the possibility of publishing the implied nodal prices currently contained in NEMDE as additional locational information. Similarly, if it is worried about congestion in particular areas of the NEM, it may review existing zones to assess whether more modular zonal pricing may be warranted.

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While Origin also understands that there has been some consideration of other options, in our view, this process has been limited and we suggest that the AEMC should engage more broadly on a range of options.

More work needs to be done before a final recommendation can be made to COAG

Origin remains concerned that review has been rushed and that significantly more work needs to be undertaken before a firm recommendation can be made. For example, the AEMC is proposing to do detailed modelling work next year – this would occur after it is expected to make a recommendation to COAG regarding its preferred model.

We understand that the terms of reference require the AEMC to report to the COAG Energy Council by December 2019. However, given ongoing concerns regarding the suitability of the proposed model, and the rushed process to date, Origin suggests that the AEMC should only provide a progress report to the COAG EC in December, noting that additional work is required.

A final recommendation at this time is unlikely to have the support of a majority of stakeholders and would not reflect evidence-based policy making. It would also not be appropriate for the AEMC to be undertaking modelling to determine if there are any net benefits to a model that it has already recommended to the COAG EC.

Instead, Origin supports the AEMC undertaking more work in 2020 as part of the COGATI review, including carrying out the cost and benefit modelling that it suggests in its discussion paper. A final decision to the COAG EC should only be made following the conclusion of this modelling and further consultation with stakeholders.

Origin also appreciates that the AEMC's review is running on a similar timeline to the ESB's NEM2025 work. We do not believe that it is necessary to combine the two reviews particularly given the magnitude of the work that COGATI requires and the discrete nature of its scope. Instead, we consider that the AEMC and ESB should continue to coordinate their work programs accordingly.

We remind the AEMC that the introduction of such a large reform takes time. Other jurisdictions that have attempted changes from zonal to nodal pricing or that have introduced financial transmission rights (FTRs) spent years designing the appropriate solution.

In ERCOT, for example, the changes took almost a decade, and involved two rounds of cost-benefit analyses.[2] Rushing to recommend and introduce a model runs the risk of perverse outcomes for consumers, leading to higher costs.

Modelling should be carried out to demonstrate clear net benefits

Origin welcomes the AEMC's proposal to carry out modelling in 2020 to assess the costs and benefits of the proposed reform. The modelling process should be transparent and should allow for consultation to enable stakeholders to comment on the underlying assumptions and approach.

In terms of the costs and benefits, we have the following comments:

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[2] ERCOT began work on moving to a nodal market soon after the market began in 2001. Nodal pricing was introduced almost a decade later. See for example Public Utility Commission of Texas http://www.puc.texas.gov/industry/electric/reports/Default.aspx

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- Costs: The analysis should capture all the costs of the reform, including implementation and collateral costs (such as the changes to the NEM's dispatch engine (NEMDE)). Origin acknowledges that some of these costs may be difficult to quantify. For example, the proposed model would introduce significant complexity to the access framework, which comes at a cost – both system upgrade costs as well as ongoing complexity that would need to be managed on an ongoing basis.

- Benefits: It is important that the AEMC demonstrates that there are net benefits associated with changing from the current access framework. Origin understands the *theoretical* rationale for nodal pricing. However, the NEM was specifically set up with zonal pricing. Any deviations from that model would lead to significant costs, which may not outweigh the benefits of reform, *in practice*.

Modelling should ideally also incorporate the impact of planned changes, such as five-minute settlement, wholesale demand response (assuming it is introduced) and transparency changes regarding new projects. Capturing the effects of those changes is important so as not to overestimate the impact of any further market design changes.

Origin also suggests that the modelling should look to quantify the magnitude of the problems themselves. Literature reviews of congestion and disorderly bidding are limited and the current and expected future levels of congestion and disorderly bidding should be determined.

Similarly, international examples provide useful lessons and information when going through a reform process. However, caution should be taken when applying these locally, given the NEM's unique design features and physical characteristics. The fact that many US jurisdictions and New Zealand have implemented nodal pricing is not a reason, in itself, to do so in the NEM.

The proposed model may lead to unintended outcomes

Generators have historically been able to manage the risk of congestion, although we acknowledge that the ability to do so could be compromised if congestion reaches unmanageable levels in the future. However, future congestion is dependent on the location of new plant and the speed at which the transmission planning and investment framework allows for augmentations to the network. This is a central issue in the coordination of generation and transmission investment – which has largely been ignored through this review process and is not clearly addressed through the proposed model.

Similarly, investors currently make locational decisions based on existing constraints and MLFs, as well as expectations regarding the changes in these variables. At times, the expectations of investors turn out to be incorrect due to forecasting errors. It is not clear that the proposed model would address this issue as investors would still rely on modelling of future loss factors to make locational decisions. Indeed, under the AEMC's proposed approach, the modelling would also be complicated by having to estimate multiple nodal prices and make decisions around FTR purchasing and bids. The forecasting risk would remain.

Origin understands that the proposed model would effectively swap the volume risk which is currently a by-product of congestion with price risk. However, we do not consider this to be an improvement:

- If FTRs are not fully firm, both price *and* volume risk would remain – therefore increasing overall risk, leading to higher costs. We are not convinced that FTRs, as proposed, would provide a perfect hedge.
- The model could lead to conservatism in hedging positions of market participants thereby affecting contract markets (e.g. it may push up contract prices or decrease contract market liquidity).

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- The limited length of FTRs could disincentivise investment as they may not provide a long enough investment signal. However, locking in longer term FTRs increases the risk of unanticipated changes to the transmission network, diminishing the usefulness of the hedge.
- Dynamic loss factors and the introduction of a volume-weighted average price (VWAP) would likely add uncertainty in the market which would also negatively affect investment incentives and costs.
- The AEMC should explore and take into account any potential gaming that could arise from its proposed model.
- The proposed model would add significant complexity. While complexity in itself is not a reason to not pursue change, in this case, when weighed against the magnitude of the problems and the required transition, the model appears to be a disproportionate response.

In short, the proposed model would add additional risk and uncertainty in the system, above and beyond existing levels of risks and uncertainty. This would then manifest itself in higher system costs.

If the AEMC proceeds with its proposed access reform model, further work on design features must therefore address the above. Origin acknowledges that the AEMC has identified some design features that could mitigate some of the above issues – however, they come with their own issues. The next section discusses the above concerns in more detail.

Design features need further work

1. FTR design

Origin is concerned that the FTRs would not be firm/adequate enough to fully hedge market participants. This is likely to increase risk in the market. Practically, if a generator ends up in a position where it considers that it does not have enough FTRs or if it expects the payouts to be inadequate, it may run lower than its efficient capacity, which would have reliability and price implications for the market.

We understand that the AEMC has acknowledged that the FTRs may not be fully firm but has chosen specific design features to promote revenue adequacy such as:

- Moving from the regional reference price (RRP) to VWAP.
- Setting the volume of FTRs conservatively.
- Progressively releasing the volume of FTRs to be auctioned and allowing for adjustment.
- Allowing excess revenue to accumulate in a fund to address future shortfalls, with scaling of payouts occurring should the fund be depleted.

However, these additional design choices also add complexity to the process and may themselves lead to adverse outcomes if not designed properly (e.g. the price of FTRs could be very high if there are not enough provided).

The proposal to include dynamic loss factors in FTRs increases uncertainty. It is not clear to Origin how dynamic loss factors would be incorporated into FTRs. It is difficult to comment more comprehensively on this aspect of the proposal without further detail from the AEMC. However, our initial view is that dynamic losses are likely to make FTRs less firm.

Origin supports the AEMC undertaking further work to assess how firm the FTRs are likely to be and any work on how they can be firmed up further. As an example, Origin understands that in most US markets longer term auction revenue rights are sold (in addition to FTRs), typically for 10 years although they can be longer in some instances, generally to promote liquidity. In Ontario, auction revenue is used to firm up FTRs, while in New York, FTRs are firmed up by having shortfalls

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recovered from the transmission companies.[3] Origin suggests that the AEMC should reconsider its proposal to use FTR auction revenue to offset TUOS charges.

It is also worth exploring the impact of FTRs on contracting practices further as well. It is likely that due to uncertainty introduced by FTRs, market participants would re-evaluate their practices which may lead to more conservative practices.

2. VWAP

Origin understands the AEMC's rationale for moving to VWAP to ensure revenue adequacy for FTRs and settlement. Revenue adequacy is crucial for the proposed model to work; however, we are concerned about the implications of moving to VWAP.

Existing hedging contracts are based on the concept of a regional reference price. Moving to a different regional price (i.e. the VWAP) would cause disruption to existing contracts in the NEM. We urge the AEMC to consider the impact of this disruption when considering the merits of its model.

To the extent a move to VWAP has the potential to significantly alter regional prices, the AEMC should quantify what the impact is likely to be as it will need to be clearly understood by market participants. Any changes to the pricing framework that undermines the ability for marginal plants to recover fixed costs could have negative implications for investment.

Origin recognises that the alternative of retaining the RRN with local prices capped at the RRP is not an enticing option either. Capping local prices at the RRP may lead to situations where prices at the node are lower than generators' short-run marginal cost, as the local price would be set independently of the generators' bids. This would dilute the locational signal, thereby undermining one of the suggested benefits of moving to dynamic regional pricing.

3. Locational marginal pricing (LMP)

Origin suggests that the AEMC should re-examine the proposed distinction between scheduled and non-scheduled generators. If the aggregate non-scheduled generation fleet is large enough, it may be appropriate for them to face the local price.[4]

Origin understands that one of the AEMC's stated benefits from introducing locational marginal pricing would be to minimise 'race to the floor bidding'. As noted in Table 1, the market floor price (MFP) of -$1,000/MWh exists by design, to allow plant time to manage their minimum loads and start/stop decisions, for example. While this can allow for 'race to the floor bidding', it implies that instances of bidding at the MFP is not automatically evidence of gaming.

In addition to doing more work on identifying the size of the disorderly bidding problem (including incorporating behavioural changes once five-minute settlement is introduced), the AEMC should

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[3] See Climate Policy Institute, 2011, International Experiences of Nodal Pricing Implementation, available from https://climatepolicyinitiative.org/wp-content/uploads/2011/12/Nodal-Pricing-Implementation-QA-Paper.pdf & Frontier, 2008, Generator Nodal Pricing – a review of theory and practical application, available from https://www.aemc.gov.au/sites/default/files/content/8e474690-be29-408d-93a5-8d5e7b4601df/Frontier-Economics-Generator-Nodal-Pricing-Review-of-a-Report-by-Frontier-Economics.pdf
[4] Origin is, however, aware that the AEMC will be considering a rule change request to reduce the threshold of scheduled and semi-scheduled participants from 30MW to 5MW, which, if adopted, may reduce the size of non-scheduled participants. See https://www.aemc.gov.au/rule-changes/generator-registration-thresholds

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examine the impact of disincentivising MFP bidding in instances where the bids are genuinely used as intended.

4. Dynamic loss factors (DLFs)

Origin understands the rationale for dynamic loss factors, as they improve dispatch efficiency. However, the more dynamic they are, the more volatile and less certain they are likely to be. The AEMC is currently progressing a rule change request to make MLFs less volatile due to concerns that the existing MLF framework is creating uncertainty, as noted in Table 1.

While Origin does not support a move to average loss factors, and generally thinks that dispatch efficiency is important, it is not clear whether the gains in dispatch efficiency from the introduction of dynamic loss factors would outweigh the costs. DLFs are likely to add uncertainty to the investment framework, adding to the uncertainty created through dynamic regional pricing. This is likely to affect investment signals.

DLFs are also likely to affect operational decisions. Uncertainty around loss factors would likely result in conservative bidding strategies, which could increase overall system costs.

It is also unclear how dynamic loss factors will be incorporated in FTRs as noted above and how MLFs would be grandfathered. Origin welcomes more information from the AEMC on these issues.

5. Complementary changes

We also note that moving to VWAP and introducing DLFs would require changes to NEMDE's hub and spoke approach to a full network model dispatch engine. Origin welcomes more information on the likely costs and implementation timeframes of such a change.

Besides the changes to NEMDE, it is likely that other changes would be needed as part of the implementation process. The AEMC should identify these as they are likely to be significant and may be costly. For example, significant changes to forecasting (e.g. would more granular demand forecasts be required?) are likely to be required both on AEMO's side and for participants.

6. Potential for gaming

Origin welcomes more information on auction design and notes that any final design needs to minimise any potential risk of gaming by participants (e.g. by strategically purchasing FTRs to negatively affect another party's position).

The AEMC also proposes that if a generator is deemed pivotal, then market power mitigation measures such as an offer cap would apply based on wholesale conditions at the time. We consider that the introduction of market power mitigation measures of this type would be sub-optimal and could undermine the efficient functioning of the NEM. If market power is found to be a potential issue, then it would add to the perception that the benefits of the proposed model are unlikely to outweigh the costs.

Grandfathering arrangements will be crucial if the proposed reform is to be implemented

If the AEMC does proceed with the proposed model, then there would be significant wealth transfer among market participants.

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Origin reiterates our earlier comment that it is important to note existing generators decided to enter the market under vastly different transmission arrangements to what is now being contemplated. While it is unrealistic to expect the policy framework to remain static, it would not be good regulatory practice to impose such a significant change on existing plant, particularly at time when reliability and orderly generator exit are crucial given the current market transition.

Given that existing generators cannot change their location, grandfathering of access rights is required and not only to manage the implementation process or transition to a new access framework. Origin would welcome further detail from the AEMC on grandfathering once it has chosen a preferred model and notes the following principles to guide the AEMC in its thinking:

- Grandfathered FTRs should be provided free of charge to existing generators.
- Both the length of grandfathering and the amount of FTRs to be grandfathered are important in order to manage our contractual, operational and investment positions.
- Ideally, the length of grandfathering should be for the life of the asset to reflect the fact that existing generators entered the market under different arrangements and cannot relocate.
- The initial quantity of FTRs provided for free should reflect 100% of implied access for each existing generator based on existing risk profiles and related contracts.
- If tapering of the quantity of FTRs must occur, then the AEMC should consider the trade-off between a long tenure and the need for its model to provide locational signals.
- An approach that attempts to model the counter-factual (what would access have been absent the reform) may be desirable, but is likely to be complex, especially if tenure is long.
- The AEMC may also consider different tapering arrangements for different generators e.g. based on time of entry into the NEM, how congested the area is, when retirement is planned etc. We note that this would however create complexity and may require subjective calls.

The implementation date is ambitious and unrealistic given the scope of changes

If the AEMC proceeds with its proposed model, a detailed implementation plan will be important in order to ensure smooth transition.

It is unclear what the AEMC means by an implementation date of July 2022:

- Would the first auction be held in 2022 with the regime coming into place in the future (i.e. when the FTRs start to pay out)?
- Would there be transitional arrangements or auctions to acquire FTRs for immediate hedging if the implementation date is immediate?
- How would existing contracts that are currently trading for 2022 and beyond be treated?

We acknowledge that this would also depend on the extent of grandfathering. However, new entrants or intending participants are likely to be disadvantaged if they cannot access FTRs straightaway.

Given the complexity of implementation and extent of changes likely to be required to effect operational and systems changes, the July 2022 date for implementation continues to be ambitious and unrealistic. We suggest that an appropriate implementation timeline would depend on several issues, including:

- Outcomes of the modelling to be undertaken by the AEMC.
- Appropriate consideration of alternatives.
- Detailed design and possible testing of technical aspects of the model (e.g. testing of FTRs, incorporating loss factors in FTRs).

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- Extent of changes required to AEMO's and market participants' systems – including given changes already under way.
- Extent of impacts to existing contracts.
- Auction design and timeframes to ensure that all market participants are able to hedge against dynamic regional pricing when the model is implemented.

Origin suggests that the AEMC should finalise its implementation date through the rule change process, once a final model has been designed and signed off on, when a more realistic date can be chosen.

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