Congestion Management Technical Working Group

Working paper – Integration with the connections regime

Purpose of paper

This working paper consider how the access regime fits with the connections regime. By design, the access regime provides signals that influence investment decisions. These signals will vary over time as available transmission capacity is used up by new projects. It is necessary to think through the timing of process so that investors receive their locational signals in a timely fashion, but not too early – since we don't want to confer valuable access on projects that are unlikely to proceed. There may be a role for batching, qualifying criteria, and/or use it or lose it provisions.

This paper consolidates the project team's thinking based on previous TWG discussions, and also provides context for a further discussion on:

1. What criteria should a connection applicant be required to meet in order to qualify to receive an offer for a connection fee/queue position?
2. How should we manage multiple simultaneous connections?
3. Should use it or lose it provisions apply? How long should the right apply for before it expires?

The connections process

The connections process in the NEM is complex and has been subject to a number of reviews. The national grid is long and varies from a strong network in some areas, often areas where thermal generation has been concentrated in the past, and weak to very weak in others, often where new generation is seeking connection. The evolving technology of asynchronous plant and our understanding of its performance has also been a complicating factor. The connection process allows for the variable characteristics of the grid by providing for a bespoke process and ability to negotiate technical standards within bounds. This has meant the connection process can be fraught.

The ESB notes that the Clean Energy Council and AEMO are currently collaborating on the Connections Reform Initiative. This should assist in streamlining the process and reducing problems post the connection process. However, the basic framework remains. Given the nature of the process and the potentially extended timeframe involved, integration into the connections process is a design consideration for any access initiative targeting the investment timeframe.

The current process does not formally establish a connection queue although the assessments of connections applications can be very dependent on the projects timing relative to other proposed projects in the same area. The Rules establish a process of a *connection enquiry* in section 5.3.3 with time limits on certain steps. The *connection enquiry* establishes the information required to proceed with a *connection application* under section 5.3.4. Section 5.3.6 then aims to provide a timeline to be met to assess the application and make an offer to connect.

These process timelines are all subject to timely and complete information provision. It is important to note that a project proponent will have a number of processes running in parallel to the connection process to obtain development approval, approval from equity and debt providers, selection of contractors and vendors etc. This can make the process to gain a connection agreement more convoluted and also make it more difficult to follow the timeline set under the Rules. However if

timelines are appropriately set and followed by all parties, then the various parties seeking connection should remain in order through the process. This would make the outcomes more predictable, at least from the commencement of the formal *connection application*.

Information and timing of congestion fee finalisation

There would be advantages in developing pre-defined connection fees which would be known to potential investors well in advance of their connection. However the impacts of a project on the grid will be dependent on the specifics of the proposed connecting plant and hence:

1. The scale of the project
2. The technology or mix of technologies proposed and hence the profile of it's use of the grid
3. The detailed location of and connection to the grid
4. The timing of the project and hence other generation connected, or already committed connect, to the grid at that time.

Ideally, the connection fee provide an efficient cost signal. The intent of imposing a connection fee is not that intending parties would passively accept the fee but rather that they would seek to optimise the project costs including the connection fee. We expect this is most important for renewable projects which have high capital costs and very low ongoing costs. The competitive market pressures would then drive parties to optimise capital costs to minimise the long run cost of supply. The NEM has also seen individual projects of large scale which would have significant impact on the use of the grid and the congestion experienced by any subsequent project. This then argues against a pre-determined fee calculated on a simplified, non-specific basis.

The TWG has previously discussed the proposal that the connection fee should be a bespoke calculation on the specific project made late in the connection process, but prior to final commitment by the proponent. Given the actual fee under such an approach would not be precisely known until late in the project development, market participants need to be well informed earlier in the process to assist them to identify the most prospective projects for development and to be able to optimise their projects. The early information should be provided through the current planning processes, the ISP published by AEMO and APRs published by TNSPs and should focus on some standardised information which could provide key information on the relativities of connecting at different points on the national grid. The process to calculate the final fee should be clearly defined and based models available such that prospective participants, or their advisers, can closely replicate the calculation.

Further work is required on the detailed information provision requirements and the specific metrics they might provide. The projection of future levels of congestion is complex and time intensive, requiring balancing cost to the provider and value to intending market participants. The projections should build as far as possible of the existing work and modelling activities by AEMO and TNSPs.

Measuring congestion as in physical terms is simpler than measuring the financial impacts of congestion, but physical measures will always have limitations. While more congestion is expected with the growth of renewable generation, that congestion may often occur at times when the value of energy is low. This then argues for a financial measure of congestion as being more valuable than physical measures. While financial measures would require price modelling, price modelling is necessary anyway to determine which generators reduce output as a new generator connects and enters the market. A focus on maximising value rather than physical access is also likely to be more consistent with the NEO and optimising the value of the transmission system.

Measuring the marginal value of congestion at potential connection points in the grid on the optimal development path is mathematically straightforward and would likely provide useful information, at

least in terms of the relative attractiveness of connecting in different areas of the grid in different years. However, the marginal cost of an additional kW at each point on the grid does not reflect the congestion which might be experienced by a generator of a particular technology type or of a particular size. Alternately a 'standard' generator or two of a particular type and size could be defined and the congestion impact of the standard generator calculated for a range of potential connection points could be quantified. This would require more resources but provide information of more direct use but targeted to the defined standard connecting plant.

The definition of a hosting capacity at various points on the grid would have some attraction. That gives further information to potential investors as to the likely scale of projects which would be attractive at various connection points. Determining a hosting capacity is also required where jurisdictions use a physical limitation on connection in a REZ.

However the hosting capacity at a connection point depends upon the mix of plant connecting at that point with an optimal mix of wind, solar, storage and controlled load delivering a higher hosting capacity than a REZ populated with a single generator type would allow to economically connect. The hosting capacity of a point is also a matter of the competitiveness of the resource and the planned project, which should be decided by project proponents. The competitiveness of project may also change over time as unit costs fall and technology improves. Despite these difficulties, it is worth pursuing the issues and seeking to devise a methodology for arriving at an indicator of hosting capacity.

As outlined above, prospective participants, or their advisers, should be able to predict the congestion fee for a particular project. To do so, the calculation process needs to be clearly defined and the base information made available. To further support the ability of potential investors to estimate the expected congestion fee for a specific project, several measures could be considered. AEMO already provides a great deal of modelling information from its work in developing the ISP. That could be reviewed to ensure it provides a common base for parties or their consultants to undertake their own modelling. A fee for service for the provision of a shared network modelling portal should also be considered.

Managing multiple simultaneous connection applications

There are potential issues with an approach where there is likely a large benefit in being 'first in'. Those issues are likely to be of most concern in areas where there is strong interest for connection from a number of proponents. From an efficiency point of view, it is also important to consider whether a rush to connect is the best approach or whether a priority for the best projects to be developed is more appropriate. The potential options for assessing connections and determining the queue position or connection fee in areas with interest from a number of parties include:

1. Retaining the first come, first served approach
2. Establishing a process to join applications together into a batch process where each project in that batch would have the same queue position or simultaneously calculated connection fees
3. Declaring a REZ and undertaking an auction for access.

A batching approach has some attraction and is being pursued as an outcome of the CEC/AEMO review of connection. This could work well with a queue approach such that all participants in a batch receive the same queue position.

The party to win an auction should be the party with the most efficient project as they will value access to that point more highly. A process could be designed which, when an application to connect was received, advertised for expressions of interest in connecting at the same point. If there was sufficient

interest, an auction process could be instigated based broadly on the REZ process. The auction approach would set the congestion fee through the auction and should incentivise the best projects to connect rather than the earliest project. However, a 'pop-up REZ' type process may introduce an unacceptable delay in dealing with applications to connect.

Qualifying criteria

Consideration needs to be given to the need for qualifying criteria for parties receiving a queue position or seeking to lock down a congestion fee. It is suggested that the queue position would be determined at the time a *connection application* was made and confirmed at the time the connection agreement was signed. The only reason a queue position might change during this period would be if a party failed to provide the project data needed in accordance with the timetable. The congestion fee is proposed to be finally determined at the time the connection agreement is finalised and again that should be on the basis that parties are connecting in the same sequence as they made their *connection applications*.

To progress through the connect process in a timely manner, the project must be well defined and key equipment identified. This will ensure projects have some financial commitment but may not be much beyond that. Criteria could be set beyond these technical information requirements to ensure the validity of the project. Those qualifying criteria might include financial criteria (availability of equity and debt), contractual backing for the project output or the lodgement of a bond. Any qualifying criteria would need to balance ensuring only projects which have a high likelihood of proceeding agreement obtain a preferential queue position or favourable congestion fee with ensuring we do not unnecessarily restrict competition.

Use it or lose it

An early application to connect would ensure a favourable queue position in the queuing option or a lower congestion fee in the case that option is chosen. This then raises the potential for third parties to secure favourable positions for projects they hope to hold or on sell rather than implement. Developers trading in projects is common and does not raise efficiency concerns. However, developing notional projects and squatting on those associated access rights will likely raise costs without providing any benefits to customers.

To prevent such actions, it is proposed that the congestion fee or queue position would be finalised close to the time of finalising the connection agreement and would have a limited validity period; i.e. once determined, there would be a time period within which the connection fee or queue position was accepted and the project committed. If not committed within a reasonably tight period, the determination would expire and require recalculation. If this type of process was not included, it would disadvantage subsequent projects and drive incentives for parties to define projects and then hold those to on sell later. The validity period needs to be determined but we note that the CEIG suggested 2 years.