Congestion Management Technical Working Group

Working paper – Options for reducing congestion impact

Purpose of paper

Connection applicants may value options that give them flexibility to reduce their exposure to a congestion fee (or unfavourable queue position). For instance, there may be opportunities for a connection applicant to fund an incremental investment in the shared transmission network in return for a lower fee, or improved queue position. Alternatively, a connection applicant may be willing to accept arrangements whereby their access is limited before other generators. Flexible options for generators to reduce their congestion impact (in return for an improved queue position) was a core element of the transmission queue model put forward by the CEIG.

This paper sets out, for discussion, the project team's current thinking as informed by previous TWG discussions. It also provides context for a further discussion on the following questions:

- Should the ESB introduce measures to recognise generator-funded shared transmission within the access regime?
- Should the ESB introduce measures to recognise generator-funded storage within the investment timeframes access model?
- Should generators have the option to accept reduced access in return for a reduced congestion fee?

Funded transmission

Current arrangements for planning and investing in transmission

As transmission is a network monopoly that is also an essential service, the National Electricity Rules establish a regulatory process to decide where and when investment in transmission infrastructure should occur.

The plan driven approach to network development aims to deliver the grid that efficiently meets the needs of customers and network users as a whole. The regulatory incentive schemes seek to drive efficient maintenance and operation of that grid and provide an opportunity for TNSPs to benefit where they can find targeted projects that deliver additional benefits.

However, other parties, particularly market participants seeking to invest in generation or storage connected to the grid, may consider other enhancements to the grid are justified based on the benefit to their projects; i.e. projects which provide a commercial benefit to the proponent but may not provide benefits which exceed the cost for all network users. With different incentives, they may also identify additional opportunities to improve the ability of the grid to host their proposed projects. The ESB is considering transmission access arrangements which seek to drive efficient connection to the grid and those arrangements should provide opportunities, where appropriate, for parties to invest in improvements to the grid over and above that provided through the regulated regime.

Opportunity for generator-funded investment in transmission

The NEM has a long history of attempting to offer opportunities for market participants to fund additional investment within the regulated, shared network. While there has been some limited use of provisions and to negotiate with the relevant TNSP to fund investment in the shared network, the

arrangements have been ineffective in the broader construct of the current access regime, as there is no structure to provide any specific access right to any party. This meant that a participant could fund investment but had no particular right to use that asset over other participants or new entrants.

The arrangements were reviewed several times over the years and some specific provisions were actually removed from the Rules as a result. The project team would like to explore how opportunities to participants to invest in grid enhancement might be made possible.

The key limitation on participants making investments in the shared grid is the inability for them to receive a private benefit for any additional capacity they provide. The ESB is considering options to manage congestion in the investment timeframe which could provide an opportunity for connecting parties to realise a benefit from upstream investment.

Given the costs involved, we envisage that generator-funded "enhancements" would take the form of low-cost, incremental investments (as opposed to merchant investment in major transmission assets). Examples of incremental investments include:

- Investment in control schemes
- Targeted investment in plant such as SVCs or impedance control devices to mitigate some constraints and allow the full utilisation of the thermal capacity of the network
- Potential incremental investment in transformer upgrades or line stringing to increase network capacity

Both the priority access variant and the congestion fee variant provide incentives to connect the right plant in the right location, taking into account the connecting plan's impact on congestion.

Under the congestion fee variant, a connection applicant who agrees to an investment that reduces their impact on congestion could receive a reduced (or even negative) congestion fee. This would not provide a specific right to any enhanced network capability, but the connecting party would benefit through the lower fee. A bespoke calculation of the connection fee based on the forecast increase in congestion driven by a project would directly incorporate the benefits from such schemes.

Under the priority access model, then such investment could potentially deliver a higher priority in the queue. This would give the investor confidence that that they will reap the benefit of their investment, rather than having the benefits eroded by subsequent connections.

Risks associated with generator-funded investment in transmission

Even in the case of incremental improvements, there are a number of challenges associated with generator funding of shared transmission assets:

- It's not easy to identify the low cost improvements due to information asymmetry between the TNSP, the generator and the regulator. TNSPs are best placed to know what opportunities are available, but they not necessarily incentivised to reveal them. Instead they may prefer to pursue a more lucrative larger investment via the regulatory process. The AER has introduced reforms that attempt to address this issue (in particular, the NCIPAP) but imbalances remain.
- If the regulatory framework succeeds in incentivising TNSPs to reveal the low cost improvements, there are further challenges in ensuring that generator charges are not excessive given the imbalance in negotiating power, and the bespoke nature of the projects.
- If the scheme is not carefully calibrated, there is a risk that the regime will create incentives for TNSPs to forum-shop between funding routes; i.e. TNSPs may find it more profitable to charge generators for network upgrades that would otherwise have been funded via their revenue determination.

Care will need to be taken in devising effective arrangements, particularly in how they fit into the connection arrangements, interact with network regulation more generally and address information asymmetries.

To be effective, the Rules and regulatory arrangements would need to be reviewed to ensure the ability to invest and gain the benefit are clear. Those arrangements need to fit to the evolving connection arrangements, maximising the opportunity to develop a more efficient connection without unnecessarily extending the time to develop a connection offer. The arrangements may also need to address the obvious information asymmetry in developing fundable projects given the TNSP is best placed to know what opportunities are available.

The network regulation process and related planning processes are now well established. The revenue rest process and network incentive schemes offer alternate paths to gain regulated revenue for network enhancements. In providing additional, non-regulated sources of revenue, we need to ensure we do not erode the effectiveness of the regulated regime in delivering an efficient shared network while providing parties the opportunity to fund additional (modest) investment where it is efficient for them to do so.

Funded storage

Another way for a generator to reduce their congestion impact is to invest in storage. Depending on which variant is adopted, it may be possible for a connection applicant to reduce their connection fee, or improve their queue position, by modifying their proposed plant to include storage.

In cases where the storage asset is co-located with the generating plant (behind the meter), the impact of the storage asset could be taken into account as part of the process to measure the congestion impact of the project (see section 5.4.2). In this case it would be necessary to have regard to the energy-limited nature of storage assets and to consider what incentives (or requirements) are in place to ensure that the asset helps to alleviate congestion in practice. This is because batteries can either alleviate congestion, or make it worse, depending on whether they are charging or discharging. Further, a battery that is already fully charged cannot help to alleviate congestion.

A second possible scenario is where a connection applicant reduces its congestion impact by helping to fund a merchant storage asset in the vicinity (i.e., an asset that is not co-located). This approach has the potential to be more scale efficient since multiple generators can make use of the asset. The ESB is considering whether it is necessary and/or appropriate for the regulatory framework to provide for these arrangements, or whether the CRM is sufficient to support these types of arrangements (via contracts for difference outside the NER).

Agree to accept reduced access

Alternatively, a connection applicant may be willing to accept arrangements whereby their access is limited before other generators. Neoen's submission put forward a proposal whereby generators that locate in a congested area could enter into an agreement to offer capacity into the CRM:

"For example, for a particular connection location, … the efficient generator size is 100 MW; more would cause inefficient congestion. The generator may want to build 120 MW, knowing that transmission will be improved with scheduled works in 4 years. The generator would then have to agree to offer 20 MW into CRM at $0, so other impacted generators can buy back their capacity for a negligible amount."[27]

These types of arrangements potentially have merit and the ESB would like to explore them further. However, there is an issue associated with the Neoen proposal, which is that even if the new generator offers 20MW at zero, demand for congestion relief may be such that the CRM clears above zero (i.e.

more than 20MW is cleared). As a result, pre-existing generators won't necessarily be able to access the extra congestion relief for $0.

An alternative approach would be to give the additional 20MW a lower priority ranking (higher queue number) within the priority access model. The new generator would be entitled to offer 100MW into tier 1 dispatch and then an additional 20MW into tier 2 dispatch. The 20MW bid would only be allocated access to the RRP if there is some transmission capacity remaining after all tier 1 generators had received their full access.