

# NEW ELECTRICITY NETWORK INVESTMENTS - THERE HAS TO BE A BETTER WAY

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Legal Briefings - By **Robert Nicholson**

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For many years, electricity generators and retail business attracted much more attention than networks. That is changing as a bow wave of new network investment is demanded by the transition of the power system from large, baseload thermal plant providing strong system stability support to widely dispersed, intermittent renewable plant supported by “firming” plant to ensure reliable supply.

The Australian Energy Market Commission (**AEMC**) expects that by 2030 6,000MW of generation will close and be replaced by 22,000MW of intermittent renewable generation and 6,000MW of storage. These numbers roughly double by 2040.

The Australian Energy Market Operator (**AEMO**) recently delivered a draft Integrated System Plan (**ISP**) which called for nine major new transmission projects to be undertaken in the near term, at an estimated cost of between \$6 billion and \$9 billion. Other smaller developments will also be required.

The regulatory environment is not well placed to deliver on the necessary expansion to and adaption of network capability and a variety of changes are under development.

# CHALLENGES

**Generators** are impacted by:

- Increasing network constraints reducing revenues (through “marginal loss factors” and being constrained off)
- Uncertainty about future constraints as more renewables are connected
- Delays in satisfying connection requirements and extra investment required to address system stability issues
- A lack of affordable firming capacity to compensate for increasing levels of intermittent generation
- Increasing levels of direct government intervention in the generation market

**Network owners** are impacted by:

- Poor regulated investment returns and the risk they could go even lower (coupled with the removal of network owners’ rights to challenge AER determinations)
- A clunky, protracted process for winning approval for large new transmission projects through:
  - gaining recognition through the ISP to ensure the development meets the identified needs of the national electricity market
  - satisfying the Regulatory Investment Test for Transmission (**RIT-T**) to ensure the benefits of the development for customers outweigh the costs
  - undergoing a further process with Australian Energy Regulator (**AER**) to establish

the allowable cost base of the asset to be constructed (and construction risks allowed for) and the revenue to be earned on the investment (other than in Victoria, which has a tender process conducted by AEMO which sets the revenue, but this is also a major undertaking)

- A shortage of the specialised design and construction resources needed to undertake the required new developments
- No workable mechanism to build scale efficient network assets in anticipation of future generation connections. At this stage no one is willing to bear the risk that such assets are not fully utilised in the future, and the progressive take up of capacity

**Customers** are impacted by:

- The cost of the new grid required to service renewable plant, as well as sizable system stability investments such as synchronous condensers
- The prospect that network costs could be allocated unfairly under the existing model for sharing interconnector revenues among customers, which does not necessarily allocate the costs to the customers who benefit from the interconnector
- The cost of increasing expensive reserve trader interventions by AEMO as it struggles to maintain system security by acquiring backup power generation and commitments from customers willing to have their supply interrupted
- A higher share of transmission charges if large loads which currently share this burden close
- Emerging costs in the distribution system to mitigate the effects of rooftop solar, which is also generating congestion on the networks
- Reduced security of supply as the issues for network owners raised above delay new investment by both generators and networks

## **IMPROVING GENERATOR INVESTMENT CASES**

Various solutions have emerged to the problems faced by new generators in addressing network constraints:

- **The Coordination of Generation and Transmission Investment Review (COGATI)**

**Infrastructure Access Model** currently under development by AEMC involves the establishment of over 600 local price nodes. Each generator will receive pool revenues based on the local price, which will reflect any constraints affecting that node. Generators can then pay to hedge the differences in price between the local and regional node (against which the contracts which underpin generator revenues are currently written - one for each State) through Financial Transmission Rights (**FTRs**).

- **The NSW government's model** where new generators establishing facilities in a dedicated renewable energy zone would pay an access right to ensure its generation is not constrained as a result of new grid constructed to service that zone. Details are still being developed but one possibility is a physical access right along the lines of the South West Interconnected System in WA. Capacity would be auctioned off.
- **COGATI's Renewable Energy Zone model** also relates only to a particular region but involves the purchase by generators of hedges against price divergences between local nodes and some other node in the meshed network.
- **The Federal government's recently announced Grid Reliability Fund**, providing \$1billion to be administered by the Clean Energy Finance Corporation under which loans and other funding will be made available to network infrastructure, grid stabilising technologies and energy storage projects. Some generators may also benefit from the Federal Government's Underwriting New Generation Investments Programme.
- **Other ad hoc government funding of network assets**, such as the Queensland government's funding of transmission assets to connect the Kidston pumped hydro project.
- **Improvements in how the ISP is developed and implemented** and better transparency and less volatility in marginal loss factors, both of which are under development by the Energy Security Board (**ESB**).

## **COGATI**

The COGATI model is intended to provide better price signals for new transmission investment and allow generators effectively to secure firm access to the grid and more reliable revenues to underpin their investments. Generators can still receive revenue through their FTRs even if they are constrained off and the dreaded marginal loss factors are done away with - they are reflected, in a more dynamic way, in the local nodal price. Locational marginal pricing has been adopted in the USA, New Zealand and Singapore.

However, while the model has generated some support from customers and network owners, it has met substantial opposition from generators, including parties whose investments the reforms were designed to encourage. The model is said to suffer from extreme complexity which will deter investment and create extra costs for participants. It also risks disrupting most existing offtake agreements and hedges. It is suggested that the costs outweigh any benefits.

At this point there is little detail available about FTRs. There is concern that they may not prove to be an efficient risk management tool and some investors perceive the model may even increase risk. Participants fear the FTRs will be too short in duration, there may be little liquidity in the FTR market and large regional players could dominate it. It is still unclear what level of FTRs will be made available and the extent to which the proceeds of FTRs will address the underlying network constraints.

There is also controversy about whether the rights of generators who had invested in good faith in establishing their current plant ought be grandfathered and how this would occur.

Critics of the model, including the State of Victoria, suggest that the main reform focus ought lie in the ISP and RIT-T reforms and other tools to manage the current issues faced by generators, including reforms aimed at making transmission loss factors more transparent and predictable.

Few believe that, if it is to be implemented, it can or should be implemented by 2022 as originally proposed and many suggest any changes to network access be incorporated in the ESB's 2025 Market Design Review.

The AEMC has been encouraged to consider whether any reform of this nature is desirable and to evaluate other options for driving greater security of access to the network. Previous reform models proposed by the AEMC, such as "scale efficient network investments" and "optional firm access" have also struggled to achieve their desired outcomes.

Undeterred by this feedback AEMC is pressing on with the COGATI package, hoping that the detailed drafting of the rules to support it, combined with more consultation, refinements and modelling of the costs and benefits, will generate more support for it.

To address the impact which the model would have on existing market contracts, AEMC proposes that it will not become effective until 4 years after it is finalised. But this may delay the investment in generation and networks which is so desperately needed because investors may want to see how a big change like this is working in practice before they commit and lenders may be similarly cautious.

## **NSW MODEL**

The NSW access model is much simpler and could be implemented quite quickly. The State is willing to "go it alone". With appropriate government support and underwriting (a factor absent in previous models), the NSW proposals look encouraging. There is potential for the model to be adopted across the national electricity network.

At this stage the model is still relatively conceptual in nature and more development work is planned for 2020.

It appears that the firm access provided only deals with constraints and losses which are mitigated by a specific new investment to which the generator has contributed and not to broader constraints or losses in the system but the new investments are intended to connect into parts of the broader network with strong system strength.

If the COGATI model were also adopted some complexity would arise in reconciling the two models.

## **TAXPAYER FUNDING**

Government funding of network assets can help overcome short term issues but, as a general principle, it is clearly preferable for the market design to incentivise the right investments without having to rely on taxpayer funding, which is inherently temporary and unpredictable and saps resources from other government programmes.

# **THE CLUNKY PROCESS FOR APPROVING TRANSMISSION INVESTMENT**

## **PROPOSALS FOR A STREAMLINED PROCESS**

The ESB, as well as NSW, have proposed that where a need for a project is identified in the ISP it would bypass the first phase of the RIT-T. It would then be eligible for a contingent project determination by AER so a network owner can work towards achieving a Regulatory Asset Base (**RAB**) for the project.

However NSW also proposes that its access model would produce an independently verified capital cost which would form the RAB for the project, reducing the current process timing and providing more investment certainty.

This solution has obvious advantages but it does need to accommodate the potential for costs to move around following detailed design, procurement and construction - all costs reasonably incurred ought be recoverable by the developer.

## **FUNDING OF PROJECT COSTS PENDING APPROVAL**

Another shortfall of the existing clunky process is that a network company has no certainty of recovering revenue from a project until it has passed all the stages, yet faces significant costs in getting the project to that stage. This has led to a raft of underwriting arrangements where State and Federal governments underwrite the eventual recovery of all the costs through the final outcome and will pay the network owner for the reasonable cost of early works if the project is not approved, or if the recovery of those costs is not ultimately approved by the AER.

The ESB has recommended the establishment of a special fund to cover these reasonable costs (presumably funded by the Federal government) but a better solution, recommended by Grattan Institute, would be for the rules to allow a transmission company to recover these costs from customers (for projects recognised by the ISP) through its existing arrangements regardless of the AER outcome, although this might be complicated for interconnectors or new entrants who do not have an existing regulated customer base.

## **POOR NETWORK RETURNS**

There are currently two models for establishing revenue streams for new transmission assets:

- **The Victorian model** where AEMO calls for tenders to build the assets and proponents bid the revenue they need to deliver the service. The revenue stream is incorporated in the Victorian Transmission Use of System charge.
- **The model operating elsewhere in the NEM**, where a transmission company has to persuade the AER that the proposed project is the best option, and that it should be allowed to recover the full capital cost.

Poor network returns could still be another obstacle to new network investment. The AER's recent draft determination for SA Power Networks' equity return is less than 5%. Some industry commentary suggests that this level of return is insufficient to ensure the long term sustainability and reliability of Australia's energy infrastructure and questions the viability of transmission network upgrades. Comparison has been made to higher returns said to arise from Victorian projects being tendered by AEMO which are understood to be more sustainable for developers.

If network companies determine that the regulated return on offer is too low to justify further investment in the network assets, this is a big problem.

The Victorian model, much championed by the late Matt Zema, overcomes this problem because you get the lowest price on offer from the market, resulting from a competitive auction.

## **ALLOCATION OF INTERCONNECTOR AND OTHER NETWORK COSTS**

### **MISMATCH OF COSTS AND BENEFITS**

Concerns have already been expressed that NSW customers will bear the bulk of the costs of Energy Connect (the proposed SA-NSW interconnector) because most of it is physically located in NSW. However, SA customers are said to receive most of the benefits by shoring up reliability given the high penetration of renewables in SA. Retrospective adjustments can be made to reflect flows across the interconnector but they are based on quantity of flows, not value.

The issue comes into even sharper focus with Marinus Link (the proposed Tasmanian – Victoria interconnector) where almost all of the benefits accrue to Victoria and the other NEM jurisdictions, yet under the current Rules Tasmania would bear a majority of the costs. VNI West (a strengthening of the Victorian network and interconnector with NSW formerly known as “Keranglink”) is mostly in Victoria but delivers disproportionate benefits to NSW.

Fairness should demand that this issue is addressed. It is also possible that some investments may not proceed unless it is.

Working out what the benefits are is not straightforward. The predicted impact of new network assets on power prices relies on modelling which is dependent on assumptions which may not be realised and is only accurate at a point in time. In reality the benefits are constantly changing. A model could be devised to re-assess the benefits at regular intervals but the ensuing changes might undermine the original investment decision. There is a case for making just one assessment of the benefits, as part of the RIT-T test and using that to allocate costs.

## **NETWORK UPGRADES ENTIRELY WITHIN ONE NEM REGION**

It is also possible for new network investment entirely within one State to benefit customers in other States. There is presently no mechanism to allocate the costs of servicing those investments to customers in any other State and, if the aim is to have the market operate fairly, there should be.

## **ALTERNATIVE COST ALLOCATION MODELS**

Where it is clear there are benefits from an investment but it is not easy to determine who benefits from them a “postage stamp” approach could be used to smear the costs across all customers in the NEM. However fairness demands that, so long as the allocation of the benefits is reasonably clear, it would make sense to allocate them as best you can to the customers who benefit.

Another approach which was considered at the inception of the NEM and raises its head from time to time is whether generators ought to share in the cost of transmission assets (beyond their specific connection assets). These costs would presumably be factored into their bidding behaviour and be passed through to customers (potentially at a higher rate as generators typically have a higher cost of capital than network owners). The COGATI model is intended to achieve this but the extent to which it would occur is not yet clear.

However, there are obvious issues in making such a fundamental change and contracts which span the introduction of such a measure may not adequately deal with it.

# LOSS OF LARGE LOADS

Alcoa has announced a review of all of its smelters. The Portland smelter is understood to be unprofitable even after the current State and Federal government subsidies. Rio Tinto has described its current energy arrangements at Tomago as unsustainable.

The loss of smelters and other large loads could have a positive effect on grid congestion but the network charges they pay (significant for Portland, less so for Tomago) would have to be picked up by all other customers as this is how the model works and is one of the reasons used to justify low regulated network returns.

These large loads also play an important role in system stability and further investment would need to be made to meet the services they provide.

## CONCLUSIONS

1. Proposed changes to how the ISP is developed and implemented and how marginal loss factors are determined will help give new generators more certainty regarding system constraints and losses in order to support their investment cases. The Grid Reliability Fund could also help on an ad hoc interim basis.
2. The COGATI access model may have some benefits but there are significant industry concerns about it, particularly from investors in new generation. The NSW access model appears easier to implement and administer although details about how it will work remain to be developed.
3. The proposals of ESB and NSW for more streamlined network augmentation approvals should deliver significant benefits.
4. A mechanism to permit recovery of the costs from customers of network project planning ahead of final approval is preferable to ad hoc government underwriting schemes.
5. Low regulated network equity returns remain a risk to delivery of transmission augmentation proposals outside Victoria.
6. Better allocation of network costs to the customers who benefit is needed for the market to operate efficiently and fairly. This applies both to interconnectors and projects entirely within one region. ESB is working on a solution.
7. Customers are likely to see higher network charges from the new investments required to achieve the transition of generation and will also have to pick up charges borne by large loads which leave the system

## KEY CONTACTS

If you have any questions, or would like to know how this might affect your business, phone, or email these key contacts.



**ROBERT NICHOLSON**  
SENIOR ADVISER,  
MELBOURNE  
+61 3 9288 1749  
robert.nicholson@hsf.com



**DAVID RYAN**  
HEAD OF  
INFRASTRUCTURE  
(AUSTRALIA), SYDNEY  
+61 2 9225 5349  
david.ryan@hsf.com

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