SUBMISSION TO AEMC SECOND INTERIM REPORT - TRANSMISSION FRAMEWORKS REVIEW

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1 Executive Summary

Australia's electricity market must have an efficient and sustainable regulatory framework in order to deliver our future transmission infrastructure needs in light of the current energy demand and policies. This transmission framework must meet the core principles summarised below.

Independent planning removes information asymmetries

An effective independent planner-decision maker eliminates the information asymmetries that prevent efficient transmission planning outcomes.

Information asymmetries exist between network users, generators and consumers, and regulated bodies. A regulator's role is to remove the barriers that prevent information disclosure and can achieve this, to a degree, through financial incentives. To date, the regulatory framework has failed to overcome the information asymmetries resulting in higher prices and unnecessary investment.

Deliver the right price and service balance

The regulatory framework must deliver needed and necessary asset investments. Planning to determine these investments must be conducted using an economic cost benefit approach.

Network regulation must reward the provision of services, not the construction of assets..

Efficiently signal and coordinate generation and transmission investment

A tradeable financial access rights regime should provide efficient locational signals that enable existing generators to manage congestion, incentivise efficient bidding and remove negative settlement residues. A tradeable financial access rights regime also facilitates improved coordination of network and generation investment.

AEMO supports a tradeable financial access model. However, there is still considerable detail that needs to be resolved to develop a workable tradeable access rights regime. Much of the work needed is in the regulatory, planning and pricing arrangements proposed to support the enhancement of the network to expand the number of rights available. The introduction of further, the AEMC should assess its proposed Optional Firm Access (OFA) model against alternative arrangements that deliver similar locational pricing signals to understand the cost and complexity of applying these to the NEM.

AEMO reiterates that the success of a tradeable financial access model depends on the ability of generators to negotiate financial access. It is likely to be severely compromised if those negotiations have been undertaken with profit-driven, monopoly transmission asset owners.

A better approach would be for such rights to be issued by a national independent transmission planner-decision maker who is not biased towards overbuilding the transmission network. This will provide a sound basis for the tradeable financial transmission rights regime and price investments at an economically efficient level.

AEMO proposes to follow up with a supplementary submission which details operational challenges for the implementation of such a model. AEMO will also discuss some of the alternative options in detail and outline a more considered view of the AEMC's proposed OFA model in a supplementary submission.

Procure transmission services efficiently

Transmission services need to be procured efficiently given their high costs. Where possible, this should be achieved through competitive tendering of the construction and ownership of major network investments. Effective competition has the capacity to reduce market power and overcome information asymmetry problems. Competition is already proving to be effective in the

construction and maintenance of network services across the NEM particularly for generation connections. Competitive markets, if allowed to develop, will also be effective in providing operation and ownership options for shared transmission services for new connections. Allowing connecting generators choice provides them with opportunities to configure their own construction and connection activities in a manner which delivers them the best outcome in terms of overall cost and risk management.

The AEMC has the opportunity to promote a framework that separates the natural monopoly elements of transmission services from the competitive elements. The AEMC can remove regulatory barriers preventing the benefits of competition flowing to generators in the NEM.

For some investment, particularly investment in the shared network, such an approach may not be practical. In those cases, procurement arrangements need to be devised which deliver results which are as close as possible to those from competition.

In this submission to the AEMC's Second Interim Report of the Transmission Frameworks Review, AEMO will expand on these core principles and present further evidence supporting the benefits of a single national independent transmission planner-decision maker. Note that the evidence presented in this submission is new and must be considered together with the previous evidence submitted in AEMO's previous submissions to the Review. We will also highlight shortcomings of the planning and investment model presented by the AEMC and address a number of factual inaccuracies underlying some of the AEMC's conclusions.

2 Independent planning removes information asymmetries

An effective independent planner-decision maker eliminates the information asymmetries that prevent efficient transmission planning outcomes.

Information asymmetries exist between network users, generators and consumers, and regulated bodies. A regulator's role is to remove the barriers that prevent information disclosure and can achieve this, to a degree, through financial incentives. To date, the regulatory framework has failed to overcome the information asymmetries resulting in higher prices and unnecessary investment.

2.1 Response to AEMC's Second Interim Report

The AEMC's Report indicates that the AEMC does not support a combined national independent transmission planner-decision maker role for the following reasons.

Enhanced National Transmission Planner without decision-making powers

Recognising the benefits of a national independent body, the AEMC proposes enhancements to AEMO's national transmission planner (NTP) role, namely formalising its involvement in reviewing Regulatory Investment Tests for Transmission (RIT-T) and Annual Planning Reports, providing national demand forecasts and taking on the Last Resort Planning Power (LRPP) from the AEMC. However, the AEMC contends that the National Electricity Market (NEM) should be working towards a more national approach and that the Victorian arrangements are not consistent with this enhanced planning role.

AEMO notes that it already exercises a national oversight role which in practice already reflects the AEMC's proposed enhancements, while also performing its role as Victorian transmission planner-decision maker. The key to AEMO's efficient and effective performance of these functions is its not-for-profit status. AEMO does not have a financial interest in any transmission network assets and is therefore able to remain truly independent and impartial. The Victorian framework has delivered, and continues to deliver, efficiency benefits that could be replicated across the NEM.

The proposal to give AEMO the last resort planning power is a formality. It consists only of a power to direct one or more TNSPs to identify the potential transmission network augmentations required to relieve inter-regional constraints and/or to apply the regulatory investment test for transmission (RIT-T) to those potential augmentations. To be effective and worthwhile, a last resort planning power must empower the planner to compel an augmentation to be undertaken. Under AEMO's preferred independent transmission planner-decision maker model, a separate last resort planning power is not needed as it would be subsumed into the NTP role.

For the reasons given above, the requirement for AEMO to apply the RIT-T as the Victorian transmission planner-decision maker (or in any national role) should not preclude it from a greater role in reviewing the application of the regulatory investment test. Where AEMO applies the test, it will be subject to both the dispute process and AER oversight.

The same principle applies to the review of TNSPs' annual planning reports (APRs) or providing the national demand forecasts for transmission planning. AEMO has no commercial incentive to overstate demand forecasts or to prepare the Victorian annual planning report with a bias towards network solutions.

Financial incentives

The AEMC considers that financial incentives will provide the most robust and transparent driver for efficient decision-making, and therefore a not-for-profit decision maker will not deliver these benefits.

The AEMC did not provide any independent evidence to support position that financial incentives have successfully delivered efficient outcomes in contracts with network service providers. The AEMC's reasoning is based on assertions supplied by GridAustralia, whose members have an interest in preserving the current arrangements.

This Review provides a unique opportunity to overhaul current weak financial incentives on Transmission Network Service Providers (TNSPs) under the current framework, but the AEMC has made no proposals to strengthen those incentives. AEMO recognises the value of incentives in the maintenance and operation of transmission assets and supports the efforts of the AER to strengthen those incentives. However, as discussed further in Section 3, the current revenue setting arrangements do not provide the right financial incentives on TNSPs to make efficient long term decisions to achieve cost-effective levels of service for generators or consumers. AEMO recommends that the AEMC should revisit how the planning and revenue setting frameworks can work together effectively and deliver efficient outcomes overall.

Links to Optional Firm Access

The AEMC considers that its proposed OFA arrangement would be best supported by financially motivated TNSPs planning the transmission system.

On the contrary, the establishment of a strong national independent transmission planner-decision maker in conjunction with financial access arrangements provides the best opportunity for those arrangements to succeed. The two aspects of network service provision that need to be considered in this respect are;

- The short term operation and maintenance of key network elements supporting the rights to ensure those rights are as firm as possible for the holders; and
- The long term decision to procure additional transmission services to underpin the provision of additional rights.

In terms of the former, the AEMC does not propose that the TNSP's should be exposed to full market risk. Rather they should face incentives and sanctions to act efficiently to support the value of OFA's. AEMO has experience building these types of incentives into the network agreements it makes with those providing network assets and services and is confident that approach could be adopted here. In terms of the longer term decision, AEMO considers that this would be best addressed and decided by an independent body, not influenced by maximising its own profits, but by wider national electricity market and efficiency perspectives.

AEMO in principle supports a financial access arrangement. However AEMO is concerned that the requirement for generators to negotiate firm access with incumbent TNSPs will simply compound the disadvantages that generators face in all jurisdictions, other than Victoria. These include dealing with limited transparency from monopoly service providers, who in many cases are not motivated to seek timely or cost effective solutions for connecting generators, thereby undermining the potential economic benefits of a financial access regime.

Conflicts of interest

The AEMC considers that an expanded national planning role for AEMO could not be combined with its role as the transmission planner-decision maker for the Victorian electricity transmission network. As a consequence the AEMC suggests that AEMO should only have these functions transferred to it if its role as transmission planner-decision maker for the Victorian electricity transmission network is transferred to SP AusNet, the predominant Victoria transmission asset owner, as is the case in the other jurisdictions.

As discussed further in Section 3, AEMO does not regard the performance of its role as the Victorian transmission planner-decision maker or the role of a national transmission planner-decision maker as giving rise to any conflict of interest given that it is not financially motivated by

the outcomes. AEMO does not consider that the AEMC has adequately explained the nature of the conflicts it claims exist between the 'enhanced' national transmission planner role and AEMO as Victorian planner.

Synergies of network operation and planning

The AEMC considers that the entity which owns and operates a transmission network should also be responsible for planning and investment decisions, and that this would result in more efficient outcomes.

The AEMC's view is that the TNSP would be best positioned to manage both network operation and investment decisions, particularly where financial incentives are in the form of rewards and penalties are used to impose accountability for service performance. Conversely, the AEMC asserts that separating investment and operation is likely to increase overall costs and risk.

AEMO does not agree. In Victoria benefits are delivered with the network operation and planning roles separated. Evidence suggests that independent decision making has resulted in superior outcomes to the outcomes in the states which have relied on financial incentives to drive optimal planning and operating outcomes.

We would also note that AEMO is the national system operator, responsible for operating and maintaining national system security. This already requires a level of separation of operational responsibilities as the benefits of a national organisation performing this role were recognised two decades ago.

AEMO considers that the AEMC should to present stronger evidence in support of its assertions than stakeholder opinion on specific aspects of the Victorian connection processes.

Competitive provision of network services

The AEMC suggested that competitive tendering would not necessarily result in more efficient outcomes and doubted the extent to which competitive tendering had achieved efficient outcomes in the Victorian electricity market.

As discussed further in Section 4, the market is capable of providing network services. Competitive tendering in the construction of new network assets is used by all Network Service Providers across the NEM particularly for generation connections. The difference is that the Victorian arrangements deliver the full benefits of competitive tendering to consumers, which can only be realised when there is a change to the current framework to facilitate new network service providers to enter the market.

Additional complexity

The AEMC considered that the independent planner-decision maker model, as adopted in Victoria, adds significant complexity to the connection process through the requirement for connection applicants to negotiate with the incumbent TNSP, AEMO and potentially a second new entrant.

As discussed in Section 4, these arrangements can in fact provide significant financial benefits and flexibility to new generators.

2.2 Independent forecasting is a step in the right direction

The AEMC supports AEMO providing national demand forecasts. AEMO welcomes this support and suggests that the evidence provided by its work on national forecasting will deliver substantial benefits if that independence is also applied to options analysis and decision making.

In June 2012, AEMO published the first independent National Electricity Forecasting Report (NEFR) which shows that forecast annual energy sales will decrease while maximum demand growth will continue to increase, but at a slower rate than previously forecast in the 2011 Electricity Statement of Opportunities (ESOO).

This changed outlook for electricity consumption in the NEM represents a major variation for the industry. Changes have been influenced by the gross domestic product (GDP); reduced consumption by the manufacturing and mineral processing sectors in response to the high Australian dollar; significant penetration of rooftop solar photovoltaic systems, and consumer behaviour.

AEMO believes that market and regulatory arrangements must be capable of responding to these changes and deliver appropriate price signals to enable efficient investment.

Under the current regulatory framework TNSPs have an incentive to overstate their required revenue, as for the balance of the regulatory control period, TNSPs are permitted to retain what they have not spent. It follows that they have an incentive to overstate their demand forecasts as their capital expenditure forecasts for network augmentation are largely driven by their demand predictions. Evidence of overstating demand forecasts is demonstrated in Figure 1a and 1b below.

Figure 1 a- Comparison of the 2012 NEFR and 2011 ESOO summer maximum demand forecasts for Queensland (Source: AEMO)

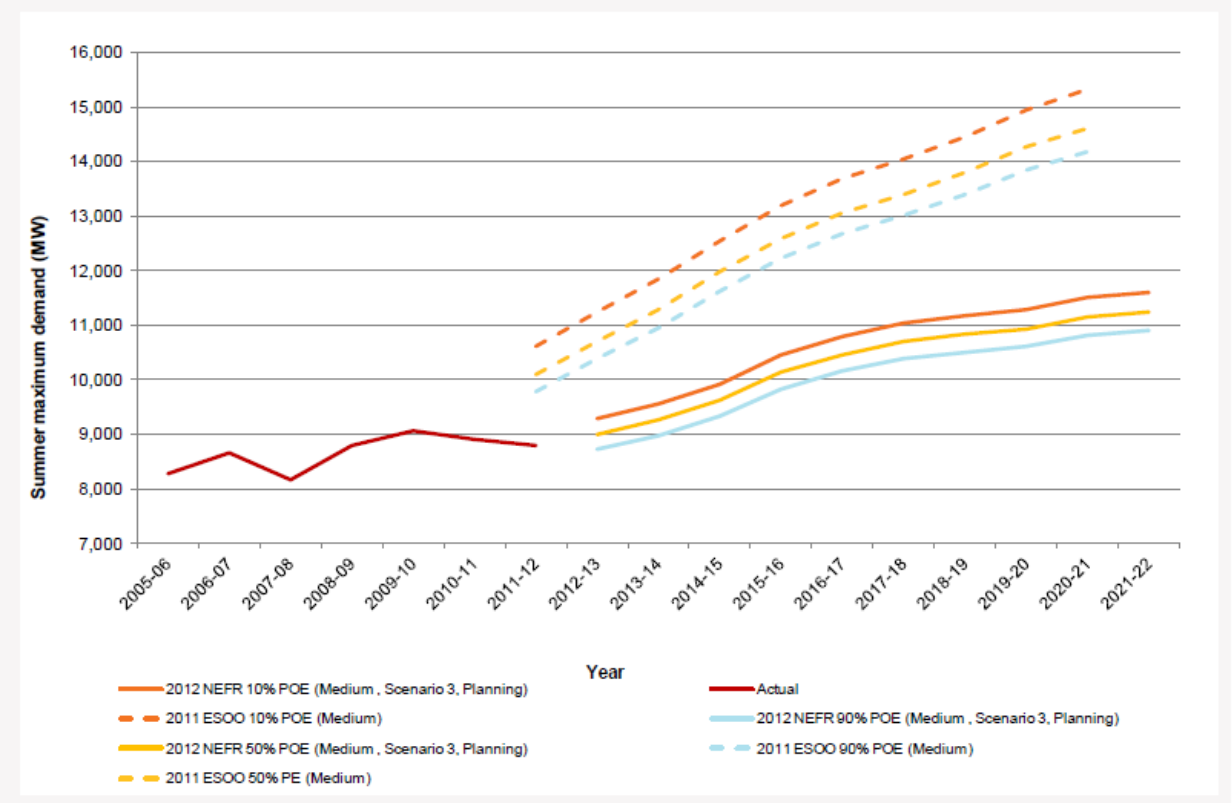
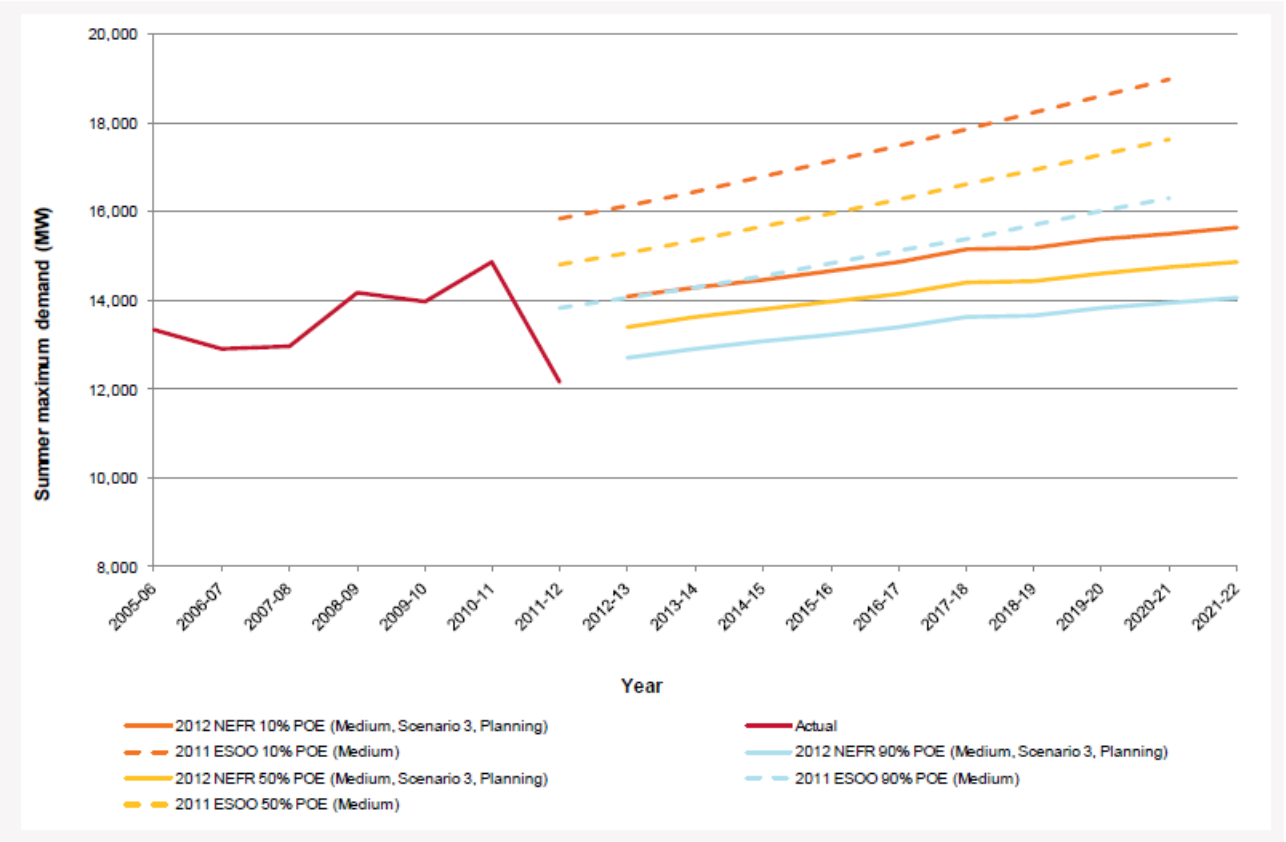


Figure 1 b- Comparison of the 2012 NEFR and 2011 ESOO summer maximum demand forecasts for New South Wales (including the ACT) (Source: AEMO)



2.3 Independent decision making is also required

An independent planning approach will deliver optimal market benefits. An independent planner will make investment decisions with no incentive to over-invest in the transmission network or to favour network over alternative non-network solutions. Instead, it applies an impartial and expert analysis to determine the investment needs of the transmission network.

AEMO, in its independent role in Victoria, undertakes a cost-benefit analysis to determine whether a specific augmentation is required and what the optimal solution should be via a probabilistic planning approach.

As detailed in our submission to the First Interim Review, probabilistic planning is an economic risk-based approach which assesses the economic risks associated with specific network limitations[1] and identifies the optimal timing and options to address such limitations. It is also used to identify network investments which improve the competitiveness of the market.

In contrast, a deterministic planning approach is adopted in jurisdictions such as Queensland and New South Wales, where there are state-based standards applied to define redundancy levels in the network for particular circumstances.

The underlying causes of such potentially unnecessary investment and overinvestment include poor forecasting, an inadequate RIT-T process (where TNSPs are not required to investigate alternative options based on different scenarios due to the time lag before projects commence), a lack of transparency and insufficient oversight.

Planning and investment decisions need to be made by an independent planner. This is the most efficient way to neutralise the incentives to over-invest in network assets and to remove the information asymmetries that prevail.

2.4 Independent planning-decision making is internationally recognised

The model of an independent not-for-profit body responsible for planning the transmission network who do not own any network assets has been adopted in jurisdictions across North America. Table 1 summarises these independent system operators.

[1] For example the likelihood and consequence of interrupting supplies to customers or constraining the economic dispatch of generation

Table 1 – North America Planning Arrangements[2]

Market Operator	Responsibilities
PJM Interconnection LLC (PIL)	PIL is the market operator for the Pennsylvania-Jersey-Maryland (PJM) market, covering Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and District of Columbia. PIL is a not-for-profit body which is required to independently and impartially manage the regional transmission system. PIL does not itself build or own transmission networks. However, one of its key functions is to carry out regional transmission expansion planning, the purpose of which is to ensure efficient, reliable and non-discriminatory transmission service throughout the PJM, following which PIL allocates the required investment to a transmission owner based on service territory. It is the transmission owners that are responsible for constructing the identified augmentations. These augmentations are funded by Federal Energy Regulatory Commission (FERC)-approved transmission tariffs that are collected by PIL from transmission customers, with PIL passing through the revenue needed to fund the augmentations to the relevant transmission owners.
New York Independent Systems Operator Inc. (NYISO)	NYISO is the market operator for New York State's bulk power transmission facilities. NYISO is a not-for-profit body which is independent from the individual transmission owners. It is responsible for leading the preparation of a "comprehensive system planning process", which is undertaken every two years. The process is initiated by individual transmission owners, following which NYISO conducts both a reliability study and a market efficiency (economic) study. It is then largely left to market forces to determine which transmission network augmentations go ahead, although NYISO is able to direct that an augmentation be undertaken.
California Independent System Operator (CAISO)	CAISO is responsible for operating California's electric grid facilities. A not-for-profit body, CAISO plans and approves augmentations to transmission infrastructure and is solely responsible for determining the augmentations that are to be made. It allocates augmentations to the relevant transmission owners, who are responsible for constructing, owning and financing those augmentations (at least where they are reliability-driven projects that are located within their service territories or are needed to maintain the feasibility of long-term congestion revenue rights). CAISO charges all customers connected to the transmission system a transmission access charge the revenue from which is passed through to the transmission owners who build the relevant augmentations.
Alberta Electric System Operator (AESO)	AESO is responsible for planning and operating the interconnected transmission and distribution systems in most of Alberta. AESO is a not-for-profit body. AESO, and not the transmission owners, is responsible for determining when a transmission augmentation is needed and evaluating investment options, although the Alberta Utilities Commission (AUC) is responsible for approving specific transmission augmentations identified as part of AESO's transmission system planning. The augmentations are funded by an AUC-approved tariff that AESO levies on all wholesale electricity consumers who use the transmission network and

[2] NERA report on International Review of Planning Arrangements for the AEMC's Transmission Frameworks Review

	the revenue from which AESO passes through to the transmission owners.

3 Deliver the right price-service balance

The regulatory framework must deliver needed and necessary asset investments. Planning to determine these investments must be conducted using an economic cost benefit approach.

Network regulation must reward the provision of services, not the construction of assets.

3.1 Replicate the efficient Victorian outcomes

The current regulatory arrangements have created an incentive to over-invest in network assets. Exacerbated by reliability standards applied in some jurisdictions, the growth in capital expenditure over the past five years has outstripped growth in both energy and peak demand and contributed to retail price rises. While some of the expenditure has been necessary to upgrade ageing assets, it is not clear that all this expenditure has been necessary.

Within a regulatory control period, TNSPs are able to roll all of their actual capital expenditure into their regulated asset base for the next regulatory control period as well as earn a regulated return on that asset base. This, plus their calculation on forecast capital expenditure, gives TNSPs an incentive to invest in augmentations rather than investigate other potentially more economically efficient non-network solutions.

The AEMC's proposed amendments to the National Electricity Rules (NER) to introduce capital expenditure sharing schemes, ex-post reviews of capital expenditure and the use of an AER-approved forecasting methodology should a little way to addressing these incentive problems.

However, even with the proposed amendments, incentives for inefficient network investment will remain. Profit-driven TNSPs will naturally continue to overstate their required revenue and include as much capital expenditure as possible in their regulated asset base.

Changes to the regulatory arrangements should therefore focus on rewarding businesses for supplying services and providing returns for valued services, complemented by the efficient acquisition of network services.

Findings from Nuttall Consulting (refer Attachment 1 to this submission) clearly support that Victoria has been operating with significantly higher utilised transformers than both New South Wales and Queensland since around 2006. It also found that there were significantly higher utilised lines in Victoria than both New South Wales and Queensland since 2006 (refer Figures 2 and 3).

These results suggest that the lower levels of augmentations in Victoria are not related to excess capacity in the Victoria network, but can be attributed in large part to independent and efficient planning and investment decision making.

Figure 2 – Weighted average actual utilisation of all transformers

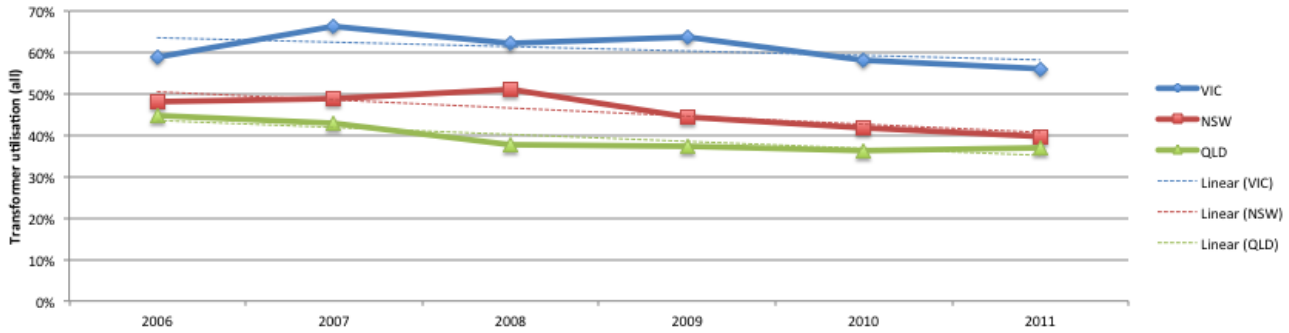
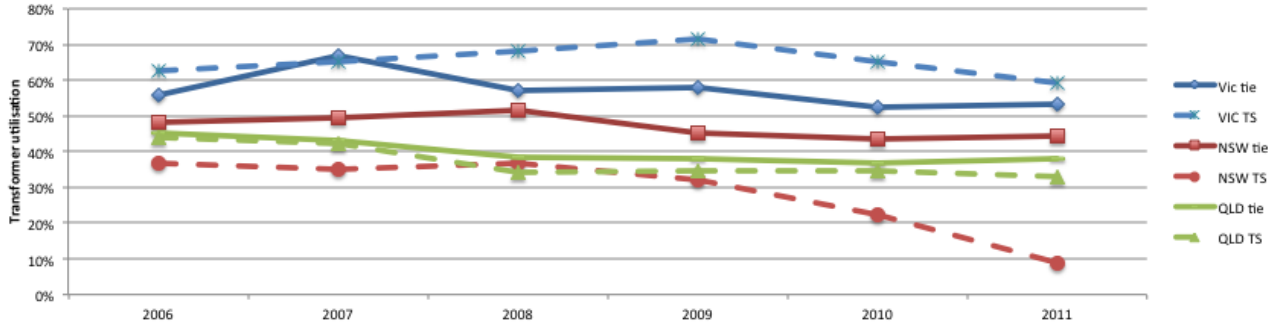


Figure 3 – Tie and terminal station (TS) transformer weighted average actual utilisation



3.2 Improve the capability of existing assets

Another consequence of the asset-focused approach to revenue setting is a conservative approach to asset ratings.

The thermal rating of lines is related to the temperature of the conductor. This temperature defines how much the conductor will deform, that is, sag between adjacent towers. For safety reasons a line has clearance limits that define the maximum permissible amount of sag. Additionally, a conductor has a maximum temperature beyond which its elastic properties will be lost and should therefore not be exceeded. The conductor temperature is influenced by a number of factors, most notably the loading on the conductor, but also the environmental parameters such as the ambient temperature and wind speed.

The historical method of defining a thermal rating was to define the set of environmental parameters so that there was a reasonable likelihood that a maximum loading could be defined and the conductor temperature or sag criteria were not exceeded.

This approach is often referred to as a static rating where the rating is fixed (or static) across a time period. To reduce conservatism in this approach, different static ratings can be defined for different time periods that have different environmental parameters. For example, Queensland uses different static ratings for different time periods that have different environmental parameters such as winter and summer ratings, or even day and night ratings, to define most line ratings.

A more contemporary approach is based on real measurements of the environmental parameters or the calculated distance of sag in the line. This information is used in a thermal computer model of network lines to calculate the rating of each line.

The result is the rating of the line on a real-time basis. Such ratings are often referred to as real-time ratings (or alternatively 'dynamic ratings' due to the use of the network line model). A real-time rating system can normally achieve additional capacity for operational purposes over the conventional static rating approach.

The benefits of moving to dynamic ratings have been demonstrated to be very significant. Powerlink has adopted dynamic ratings on two lines, named 855 and 871.

Figure 4 highlights the effects of dynamic ratings on these two lines. The effect is shown as a 40 per cent increase in network capability on these lines at peak times over the past 3 years.

Figure 4 – Comparison of dynamic and static ratings in Queensland during peak times (source AEMO)

3.3 Businesses should be rewarded for extending the life of assets

One of the reasons cited for the increase in network charges is aging transmission infrastructure. AEMO believes this issue is overstated as a result of the building block approach which rewards businesses for constructing assets. TNSPs do not receive any regulated revenue for a transmission asset that has depreciated beyond its economic life. A rational business should therefore replace that the asset. This is likely to have resulted in significant asset replacement program proposals by the businesses.

In many cases is it is possible that the asset that is being replaced is still capable of providing a service. A transmission business should therefore be rewarded for retaining and utilising that asset if they believe it is technically capable of continuing to provide a service.

To encourage a TNSP to retain existing assets approaching their end of economic life, the business should be rewarded for extending its life in a safe and secure manner. This allows a TNSP to decide more objectively if it is more profitable to continue to operate the asset than to replace it. Such decisions will give greater rewards for the TNSP and lower transmission charges for consumers.

AEMO suggests that the AEMC consider how this could be achieved within the current transmission planning framework.

4 Efficiently signal and coordinate transmission and generation investment

A tradeable financial access rights regime should provide efficient locational signals that enable existing generators to manage congestion, incentivise efficient bidding and remove negative settlement residues. A tradeable financial access rights regime also facilitates improved coordination of network and generation investment.

AEMO supports a tradeable financial access model. However, there is still considerable detail that needs to be resolved to develop a workable tradeable access rights regime. Much of the work needed is in the regulatory, planning and pricing arrangements proposed to support the enhancement of the network to expand the number of rights available. The process to stage the implementation of the overall regime needs to be designed and could allow timely commencement by leaving many of these difficult issues for subsequent stages. As part of this process, the AEMC should assess its proposed Optional Firm Access (OFA) model against alternative arrangements that deliver similar locational pricing signals to understand the cost and complexity of applying these to the NEM in the longer term.

AEMO reiterates that the success of a tradeable financial access model depends on the ability of generators to negotiate financial access. It is likely to be severely compromised if those negotiations have been undertaken with profit-driven, monopoly transmission asset owners.

A better approach would be for such rights to be issued by a national independent transmission planner-decision maker who is not biased towards overbuilding the transmission network. This will provide a sound basis for the tradeable financial transmission rights regime and price investments at an economically efficient level.

AEMO proposes to follow up with a supplementary submission which details operational challenges for the implementation of such a model. AEMO will also discuss some of the alternative options in detail and outline a more considered view of the AEMC's proposed OFA model in a supplementary submission.

4.1 Response to AEMC's Second Interim Report

AEMO offers the following comments on the AEMC's arguments in support of its proposed OFA model.

Design of instruments

OFA rights would deliver greater price discovery through eliminating dis-orderly bidding and would price energy at the generator's connection point more efficiently. AEMO welcomes this improvement. It would also allow generator participants to consider their congestion risk and purchase rights if it was in their best interests to do so.

The rights proposed will not be tradeable, either to other generators or to traders and retailers. While the rights would provide more efficient pricing for generators, they would maintain the status quo with respect to pricing for customers and would leave the price at the regional reference node as the basis of financial contracting. While this may be the only option in the current political context, it should be recognised that it has implications for the equity of inter-regional versus intra-regional trading. The proposed arrangements will permanently cement the current regional arrangement of the NEM and preferentially allocate transfer capacity to intra-regional generator rights over inter-regional trade. This leaves inter-regional trade with the residual capacity, at least until parties purchase additional specific rights. AEMO suggests that attention needs to be given to the design of inter-regional OFAs to ensure they are designed to be tradeable.

Modifications to systems

The changes to systems would be primarily limited to modifications to settlements and a new system to register OFA rights. Systems to auction rights and to allow secondary trade in rights would need to be considered especially in regard to inter-regional OFAs which would replace Inter-regional settlement residue auctions.

AEMO suggests that the AEMC might wish to reconsider the concept of "flowgate" against a simpler design of a TNSP providing a single OFA right to the RRN. This right would then be reflected in all constraints protecting that TNSP's assets in which the generator is represented.

Planning and network development

The proposed OFA regime would have significant implications for transmission network planning and development. The implications of the OFA on network development are the least developed area of the proposal.

The proposal as currently outlined has profit-motivated TNSPs undertaking the analysis and determining actions and costs to provide OFAs to interested generators. At the same time, the revenue setting arrangements encourage TNSPs to remain low risk asset owners and investors. As a result, they are likely to take risk-averse positions when conducting their network analysis and propose conservative, and potentially expensive, investments to back any OFAs.

From a generator's perspective, they will be dealing with a monopoly in an environment where there is significant information asymmetry.

Because the proposal maintains the linkage between rights and investments, AEMO does not consider that there is any conflict in AEMO issuing rights. Rather, it could provide real advantages to generators and to customers for an independent party to be making the decisions on the most effective way to provide OFAs and then procuring those works and services in the most cost effective manner.

The proposal is for generators to be charged long run marginal cost of the network services used to deliver the OFAs. We agree this is the most efficient way in which to price network services. However, in practice this has proven to be challenging. It has been considered for customer transmission pricing but has never been successfully implemented. Implementation will therefore require a number of simplifications and assumptions. It would be useful for the AEMC to provide an indication of the level of detail, accuracy and granularity that a TNSP would be expected to use in calculating the long run marginal cost. For example, it might be sufficient for a TNSP to break up its region into 5 or so zones and apply one price for each.

Efficient pricing to generators whilst maintaining the existing regime for customers would have customers bear any difference between the actual cost of network development to offer OFAs and the LRMC paid by generators. While AEMO notes that this is clearly a major improvement over status quo where customers effectively bear all the risk, from an economic efficiency point of view there will be two separate drivers for investment in the grid:

- Investment for customers which is premised on that investment providing net market benefits; and
- Investment for particular generators who agree to take up the offer of OFAs based on the (private) benefits for them.

Consideration needs to be given as to how to maintain the overall efficient development of the grid in this environment and make development decisions without the risk of queuing and gaming. There is also a risk of cost shifting, where any excess of costs over the receipts from generators is borne by customers.

Network regulation

The proposal has profound implications for the regulatory regime. The current revenue setting arrangements are designed to cope with incremental demand growth and clearly defined reliability standards. To date, this has proved challenging due to the information asymmetry problems. The proposed arrangements will exacerbate the problem by requiring the regulator to approve investments that may not be in the long term interest of consumers who ultimately pay for such investments.

The fundamental design of the ex-ante revenue cap approach to network regulation cannot work with this proposal and must be revisited.

Staging of implementation

AEMO suggests that the AEMC considers how to stage the implementation of the OFA given the size and scope of changes proposed in the full implementation. There will be some detailed issues to address in the implementation of the rights themselves; both in the recording, application and settlement of those rights and in the information regime required to support market trading. AEMO will include in its supplementary submission, a discussion on implementation challenges for the OFA.

As outlined above, however, AEMO considers that much of the complexity to be resolved is in the broader impacts of the regime on planning and development of the network, the regulatory regime and the transmission pricing arrangements. Staging may allow these matters to be deferred while the market could draw some early benefits from the OFA regime.

4.2 There are benefits of a financial access rights regime

AEMO engaged Intelligent Energy Systems (IES) to assess the potential economic benefits of introducing financial access to the market – a form of access rights – to electricity generators (refer Attachment 2 to this submission).

The IES modelling was designed to distinguish between the status quo scenario and a scenario with a financial access arrangement in place.

The IES modelling shows:

- By providing generators rights for settlement at the regional reference node (RRN) they will locate in more appropriate locations. This benefits the market as a whole because efficiently-located generators and the corresponding transmission investment will lead to lower overall transmission costs;
- Generator sensitivity to the constraint limits (i.e. the physical limits on network capacity) indicates there may be a considerable value in introducing access rights.

It has not been possible to produce a quantitative valuation of the net market benefits. However, we have used these results as a directional indication that a long-term market benefit is likely to arise from adopting some form of financial access rights, as opposed to the status quo. AEMO agrees with the AEMC sentiments that the limitations to the exercise are due to the nature of the change, suggesting that first principles will provide a better guide.

5 Procure transmission services efficiently

Transmission services need to be procured efficiently given their high costs. Where possible, this should be achieved through competitive tendering of the construction and ownership of major network investments. Effective competition has the capacity to reduce market power and overcome information asymmetry problems. Competition is already proving to be effective in the construction and maintenance of network services across the NEM particularly for generation connections. Competitive markets, if allowed to develop, will also be effective in providing operation and ownership options for shared transmission services for new connections. Allowing connecting generators choice provides them with opportunities to configure their own construction and connection activities in a manner which delivers them the best outcome in terms of overall cost and risk management.

The AEMC has the opportunity to promote a framework that separates the natural monopoly elements of transmission services from the competitive elements. The AEMC can remove regulatory barriers preventing the benefits of competition flowing to generators in the NEM. For some investment, particularly investment in the shared network, such an approach may not be practical. In those cases, procurement arrangements need to be devised which deliver results which are as close as possible to those from competition.

5.1 Response to AEMC's Second Interim Report

The AEMC has made a number of recommendations relating to connections in its report. AEMO's views on these are set out below.

Additional transparency for new connections

AEMO supports the AEMC's proposal for additional transparency around connection negotiations. However, AEMO considers that transparency alone will not deliver improved outcomes for connecting parties unless accompanied by regulatory reforms that promote competition.

Generators and large customers have expressed concerns that the current NEM transmission connection process is inefficient and costly. They have almost unanimously supported the introduction of competition for shared network services.

Presently, most generator connections are driven by meeting the Large-scale Renewable Energy Target (LRET). The number of renewables and smaller distributed generation connections highlight the complexity and shortcomings of the current Rules and TNSP negotiating frameworks, as well as the importance of efficient generator connections to the transmission network. A competitive transmission framework supports efficient generator connections and increased transparency, reducing information asymmetries.

The AEMC has acknowledged the limitations of profit-motivated TNSPs to engage in effective negotiation. A typical participant complaint is that where TNSPs have agreed to a tender to construct the connection assets, the TNSP will not disclose the reason for the chosen tender process to connection applicants.

The implementation of an effective, competitive regime for the provision of network services will address inequities in information sharing and ensure independent, transparent information is disclosed to connecting parties.

Failure of the Victorian connections arrangements

The AEMC asserts that the Victorian connections arrangements have not been successful because SP AusNet, the incumbent transmission provider, has won the majority of the tenders.

As the AEMC is aware, the threat of competition encourages efficient outcomes. In all tenders let in Victoria to date, multiple service providers have tendered to provide network services. The dominance of incumbent players is decreasing as competition evolves. This is evident with the arrival of a significant new participant, Transmission Operations Australia (TOA), which has recently signed contracts to provide shared network services in Victoria with AEMO and Mt Mercer Wind Farm.

A national platform will increase the ability of network service providers, such as TOA, to supply services to new generators.

Further, the Victorian arrangements enable generators to build, own and operate facilities independently[3], which is an additional enabler of competition as flexible procurement solutions can be developed.

This suggests that the Victorian arrangements are successful, and will deliver increasing benefits as competition strengthens over time.

International connections advice

The AEMC engaged Deloitte to compare Ireland's Single Energy Market – which enables the competitive provision of connection services – with the NEM, to understand whether there are barriers preventing competition in the NEM[4]. Deloitte argues that one reason competition cannot be applied in the NEM is that it requires the creation of an independent body to oversee connections, a role performed by the Irish Transmission System Operator (TSO). It also argues that limited competition in the provision of connection services, a loss of economies of scale and tax liability issues mean this form of competition cannot be applied to the NEM.

Deloitte's findings demonstrate a lack of understanding of the competitive and institutional arrangements that already exist in the NEM, and of recent developments in Victoria. In conducting its assessment, Deloitte did not engage with AEMO to understand the Victorian Connection Arrangements. As noted above, at least one major non-incumbent operator has signed contracts to provide shared transmission services in Victoria and is likely to be capable of providing these service throughout Australia if the market were to be opened up to competition. AEMO also understands that the tax liability issue referred to by Deloitte would only arise in limited circumstances where an entity builds and then transfers the assets to another TNSP to own and operate the assets. AEMO acknowledges that any build-own-transfer option would require additional work before it can be implemented.

Clarifying the distinction between network services

AEMO supports the AEMC's recommendation to clarify ambiguity in the NER around the classification and cost recovery arrangements for shared and connection services. AEMO supports removing the definition of extensions, which presently creates an artificial barrier between services that can be provided competitively and those that cannot. Instead, competition should be allowed to prevail beyond the interface works with the incumbent asset owner. This would include the competitive provision of all augmentations, terminal or substation assets up to the substation fence or the terminal point of the shared network, as well as for the assets between the substation fence or the terminal point and the generator.

AEMO strongly disagrees with Grid Australia's position that extensions to existing transmission networks can be classified as assets providing 'non-regulated' services. While AEMO supports greater clarity, even under the current Rules it is quite clear that the cost of network extensions

[3] Cross-ownership provisions prevent the wholesale ownership of generation and transmission, but a generator is able to build-own-operate some shared transmission services providing they obtain a licence or exemption.

[4] Deloitte report 'Implementing contestability within connection arrangements' for the AEMC's Transmission Framework Review Second Interim Report.

undertaken to facilitate a connection should be recovered through negotiated transmission service charges, whether or not the provision of the extension is 'contestable'. AEMO would be happy to provide further information on this issue should the AEMC require it.

AEMO agrees with the AEMC that connection services should be subject to third party access. Therefore we continue to support connection points being subject to negotiation on a case-by-case basis.

5.2 Network services are being provided competitively

Competition already exists in the market for network services. All network businesses across the NEM use competitive processes to build and maintain their facilities. This suggests that some of the elements of the network delivery chain can be provided by the competitive market.

The elements of network delivery are set out in Table 2.

Table 2 Elements of the network delivery chain

Element	Description	Natural Monopoly
Planning	Consideration of a project's need taking into account current service levels and the need for future services (generation development or load growth)	Yes
Constructing	The physical building or installation of assets, plant and equipment	No
Operating	Operating assets, plant and equipment to deliver the defined service	No
Maintaining	Routine servicing of assets, plant and equipment	No
Owning	Ownership of the assets, plant and equipment	No
Connecting	Connecting new generation and loads (either directly or via distribution networks), taking into account the effects on existing and future network users	Yes

The market for new transmission infrastructure will continue to grow as new opportunities arise. There are 13 Network Service Providers in the NEM, all of which would be capable of competing with one another if the regulatory framework facilitated competition in all NEM jurisdictions.

Greater competition, particularly for new generator connections, will have a flow-on effect for consumers by providing more efficient outcomes.

Currently, the benefits of competition have been limited to the building and installation of assets outside the incumbent TNSP's immediate network. There are many reasons for this, including:

- transmission has natural monopoly characteristics, such that TNSPs can exercise market power to impede competition in any part of their network or in respect of network planning or operations roles;
- the TNSPs' natural monopolies are reinforced by legally explicit and implied territorial franchises over which they have sole rights of augmentation and connection; and

- allowing third parties to conduct work on transmission assets on property and assets owned by TNSPs (for example, work within substations or work on circuits and other assets owned by TNSPs) presents a risk to the TNSPs' assets and the secure continuity of transmission services.

In both Australia and internationally, benefits from the competitive provision of electricity transmission network services have been demonstrated, with many countries exploring opportunities to introduce additional competition. The AEMC's proposals appear to be running counter to these initiatives. Some examples below illustrate this point.

5.2.1 Competition in Victoria

The Victorian arrangements provide significant scope for the competitive provision of shared network services, with recent changes to the framework supported by generators[5] [6] [7] because:

- they permit the operation, as well as the construction, of stand-alone augmentations by competitive providers. Such an outcome is made more difficult in jurisdictions such as Queensland and New South Wales, which do not have a transparent process for enabling new players to obtain the authorisation they require to operate electricity transmission infrastructure;
- they provide for competitive tendering, not just for network extensions but also for any stand-alone augmentations regardless of their location in the network (e.g. substations); and
- the tender process is transparent to connection applicants, with the benefits of competitive prices passed directly to the connection applicant and not retained by AEMO or the incumbent TNSP.

The potential for these arrangements to result in efficient pricing outcomes is evident by comparing the costs of two technically comparable terminal stations projects, where one was completed entirely by the incumbent TNSP, and a second completed by a new entrant transmission service provider.

A summary of the cost breakdown is provided in Table 3.

Table 3 –Breakdown of project costs

[Confidential — supplied under separate cover]

[5] AGL states that "improvements to the current connection arrangements to support competitive provision of transmission network access to generators… with the option of connection applicants selecting competitive provision of connection services through, for example, adoption of a build-own-transfer (BOT) model". Further, AGL supports "revisions to the Rules to facilitate competitive provision of connection services to address the imbalance in bargaining power of the TNSPs". This should be the prime focus of the changes to the economic regulation of transmission services[5]: AGL Submission to AEMC TFR First Interim Report, P8

[6] The Clean Energy Council believes that "costs provided by TNSPs for negotiated transmission services are significantly inflated from that expected to be realised through a competitive process": Clean Energy Council Submission to AEMC TFR First Interim Report, P14

[7] TRUenergy "have always felt that there has been an imbalance in the bargaining power when negotiating with a monopoly service provider during the connection process[7]". They state that "in Victoria, we are already pursuing this option [of developing a regime that would allow generators to procure connection-related services through a market-based approach] by exploring with AEMO options to facilitate the development of a Build, Own, and Transfer model for contestable augmentations: TRUenergy Submission to AEMC TFR First Interim Report, P8

AEMO acknowledges that there are some complexities with the Victorian arrangements which are in part due to the additional choice provided to generators as well as AEMO's involvement. AEMO has proposed an alternative connection arrangement that minimises its involvement and further reduces connection costs. AEMO's proposed arrangements are described in more detail later in this section.

5.2.2 Competition in the United Kingdom

The UK Government has set a target for 2020 to meet 15 per cent of the UK's energy needs from renewable sources. To meet this target about 30 per cent of the UK's electricity is required to be generated by renewables by 2020. Offshore generation is likely to be an important part of meeting this target. However, considerable uncertainty remains over the precise quantity and timing of offshore development, as this will be driven by commercial decisions that factor in future development costs, the level of subsidies available and any planning, technological or supply chain constraints.

The UK Government and Ofgem (Office of the Gas and Electricity Markets) recognised the potential benefits of a coordinated approach to developing offshore electricity transmission infrastructure projects. These include lower overall capital costs, reduced environmental impacts and fewer planning-related delays. For these reasons, the decision was made to extend National Grid's onshore System Operator responsibilities to include offshore assets. National Grid's responsibilities include developing a coordinated electricity transmission system and the creation of a licence obligation requiring the System Operator to develop an Offshore Development Information Statement (ODIS).

In early 2011 the Department of Energy and Climate Change (DECC) and Ofgem launched the Offshore Transmission Coordination Project. This project included stakeholder input and specialist reports on the benefits, costs and risks associated with different offshore grid configurations, and on the potential regulatory and commercial measures for incentivising coordination.

The findings suggest that coordinated offshore network development does indeed have the potential to deliver significant savings. Savings of between 8-15 per cent – or £0.5-3.5 billion[8] – capturing some of the potential benefits and risks associated with coordinated grid configurations have been identified in comparisons with radial transmission configurations.

Modelling was undertaken by TNEI/PPA Energy and Redpoint Energy using four generation scenarios. The results found that coordination in respect of The Crown Estate (TCE) Round 3 Zones has the potential to deliver savings as well as increase as higher levels of generation are assumed.

5.2.1 Competition in North America

Federal Energy Regulatory Commission (FERC) Final Rule of Order 1000

The Federal Energy Regulatory Commission (FERC) in their Final Rule of Order 1000[9] has found that incumbent transmission providers deprive customers of the benefits of competition in transmission development, and associated potential savings, as a result of the federal right of first refusal. This right is defined as a rule, regulation, practice, or contract affecting the rates for jurisdictional transmission service.

[8] Approximately $AUS0.7-5.4 billion

[9] Order No. 1000 is a Final Rule that reforms FERC's electric transmission planning and cost allocation requirements for public utility transmission providers. The rule builds on the reforms of Order No. 890 and corrects remaining deficiencies with respect to transmission planning processes and cost allocation methods (http://www.ferc.gov/industries/electric/indus-act/trans-plan.asp)

In response, the FERC has eliminated federal rights of first refusal by adopting a framework for qualification criteria and protocols to govern the submission and evaluation of proposals for transmission facilities in the regional transmission planning process.

The FERC found that there is sufficient justification and reasonable expectation that competition would have beneficial impact. After previously rejecting change on the assumption that the existence of multiple transmission developers would lower costs to customers, the FERC decided that the federal right of first refusal is unjust and unreasonable because it "may result in the failure to consider more efficient or cost-effective solutions to regional needs and, in turn, the inclusion of higher-cost solutions in the regional transmission plan."[10]

As a result of the rule change, transmission developers can innovate potential solutions for consideration in their regional transmission planning processes. It also allows new and incumbent transmission developers to share similar benefits and obligations to construct and own transmission facilities.

Alberta Electric System Operator (AESO)

The Alberta Electric System Operator (AESO) is currently establishing a competitive process to determine eligibility to apply for the construction and/or operation of transmission facilities[11]. Incumbent transmission facility owners (TFOs) and new market entrants would bid on an asset, and be responsible for all activities - engineering, procurement, construction, ownership, as well as operation and maintenance. Costs resulting from the competitive process would require approval from the Alberta Utilities Commission (AUC), and any approved project costs would be recovered in AESO's Independent System Operator tariff.

5.3 A competitive framework for new connections

Competition must be the cornerstone of the connections process. AEMO submits the following connection process for the NEM that supports choice for generators and minimises the involvement of AEMO. It delivers a platform for the efficient provision of network services, be it by the incumbent asset owner or a third party.

The model presented is only a preliminary view on the arrangements for a new approach and AEMO notes that further work and analysis is required.

To understand the benefits of the proposed model, it is worthwhile revisiting the current connection process. The proposed and current connection process is set out in Figure 6 below.

5.3.1 Current connection process

A principle underlying new network connections is that all parties are provided the opportunity to form a connection to and have access to a network. The terms and conditions of that connection must be fair and reasonable and agreed between the TNSP and the intending connection applicant.

The Rules contain a number of processes that a connection applicant and NSP must follow when a new connection, or modification of an existing connection, is sought.

A connection enquiry requires an intending applicant to advise the TNSP of the type, magnitude and timing of its proposed connection to the network.

In response to a connection enquiry the TNSP must provide the intending applicant information setting a number of matters including the preliminary program and access standards.

[10] FERC Final Rule Order 1000, P264

[11] NERA report on International Review of Planning Arrangements for the AEMC's Transmission Frameworks Review

The technical terms and conditions of connection agreements, such as standards or performance, are set out in the schedules to Chapter 5 of the Rules. Schedules 5.2 and 5.3 set out the automatic access standards and minimum access standards.

Following receipt of the responses from a TNSP the connection applicant can proceed with its application to connect providing the application contains all relevant information required and specified by the TNSP in response to the connection enquiry. The TNSP must then assess the connection application in the timeframe set out in the preliminary program.

Should a connection applicant not be able to meet, or not seek a connection at, the automatic access standards, that connection applicant must apply for a negotiated access standard. An NSP must accept a negotiated access standard providing that the negotiated standard is not below the minimum access standard and does not have the potential to adversely affect power system security or the quality of supply for other network users.

Typically, the trade-off between a connection at the automatic access standard and another access standard is that the cost of connection at another standard may be reduced.

AEMO performs due diligence on the system security implications of the proposed connection and must be satisfied that a lower negotiated connection does not compromise national system security.

After resolving these matters, the NSP will submit an offer to connect to the connection applicant. The offer to connect must be fair and reasonable and consistent with the safe and reliable operation of the power system in accordance with the Rules.

The NSP must use its reasonable endeavours to provide the connection applicant with an offer to connect which includes the location of the proposed connection point and the level and standard of power transfer capability that the network will provide.

The process described above has not delivered competitive provision of network services in states other than Victoria. The reasons for this include:

- TNSPs have the unfettered power to exclude any competitive conduct on any part of their network or aspect of network planning or operations roles;
- TNSPs have legally explicit and implied territorial franchises over which they have sole rights of augmentation and connection;
- allowing third parties to conduct work on transmission assets on property and assets owned by TNSPs (for example, work within substations or work on circuits and other assets owned by TNSPs) presents a risk to the TNSPs' assets and has therefore been prevented;
- All guidelines developed focus on the physical configuration of network augmentations to enable a connection, rather than the services. Focusing on the technical requirements limits innovation in the connection services and therefore delivers substandard results which are uncompetitive.

5.3.2 A new approach to the connection process

AEMO's new approach modifies the current connection process in four key ways:

1. The application is not submitted to the incumbent transmission business. Rather it is submitted to AEMO to independently conduct national system security assessments.

   This ensures that the information supplied to the Generator is independent and is not affected by vested financial interests in the outcome.

2. Information is supplied to the market at the time of the connection enquiry and connection application.

This provides potential service providers with the ability to approach the generator and propose a specific augmentation proposal and the incumbent business with the ability to prepare for the connection. It reduces the information asymmetry between the incumbent, the generator and other potential service providers.

3. Generators are provided with requirements that focus on the underlying services and do not detail the assets that are required to ensure compliance with the service requirements.

   This allows generators to propose unique solutions, providing competition in both the provision of the physical infrastructure as well as the solution provided.

4. Finally, unlike the Victorian connection arrangements AEMO is not involved in the commercial negotiations. Rather, the negotiations are between the generator, the incumbent asset owner and the new asset owner (if applicable). The framework will be set out in the rules with recourse to the AER to administer the negotiating parameters and arbitrate disputes.

The obligations of the individual parties set out in Table 4 below.

Table 4 - Obligations for parties involved in connection negotiations across the NEM

Generator	AEMO	Incumbent TNO	New TNO	AER
Submit all information required to assess connection requirements and impacts	Identify security and reliability obligations within 90 days	Negotiate in good faith with generator and new TNO	Negotiate in good faith with generator and incumbent TNO	Produce guidelines on service requirements
Comply with requests from AEMO & AER	Specify service (quality) obligations	Comply with AER direction	Allow use of new assets to future new TNO	Audit ITNO costs and approve prescribed time period
Verify service obligations	Decide whether connection requires an augmentation that could be provided by a new TNO and provide tender options to generators within 90 days	Submit interface costs to AER for approval	Register in the NEM or seek exemption	Publish design standards
Inform AEMO of preferred procurement option: 1. AEMO conducts tender; or , 2. Generator seeks own offers based on AEMO specifications; or, 3. Negotiate only with incumbent; or, 4. Proceed with Build Own Operate/Transfer	Verify service obligations in negotiated connection agreements	Allow use of existing land and access to land for life of new assets		Resolve disputes about proposed amendments and determine the terms of the amendments
Negotiate with incumbent/New TNO based on AEMO service obligations.		Provide assistance to AEMO in preparing a detailed tender specification		Hear arbitration disputes
Register in the NEM or seek exemption		Provide all asset data to generator for construction and operation		

Figure 6- New approach to connections process