AEMC

REVIEW

Australian Energy Market Commission

LAST RESORT PLANNNG POWER REVIEW: 2011 DECISION REPORT

Commissioners

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About the AEMC

The Council of Australian Governments, through its Ministerial Council on Energy (MCE), established the Australian Energy Market Commission (AEMC) in July 2005. The AEMC has two principal functions. We make and amend the national electricity and gas rules, and we conduct independent reviews of the energy markets for the MCE.

Executive Summary

Transmission network planning arrangements

Currently planning of the transmission networks in the National Electricity Market (NEM) are primarily undertaken by the jurisdictional planning bodies (JPBs) and the Australian Energy Market Operator (AEMO). The JPBs prepare Annual Planning Reports (APRs) that describe the network development plans for their respective states' transmission networks,[1] while from 2010, AEMO has been preparing the National Transmission Network Development Plan (NTNDP) which aims to coordinate between the APRs of the individual jurisdictions and provide a long-term vision for the development of the NEM transmission network.

In addition, before a network augmentation can be undertaken, the associated Transmission Network Service Provider (TNSP), or TNSPs, must apply the Regulatory Investment Test for Transmission (RIT-T) to identify the network development options that provide the most benefit to the market.[2]

While the JPBs have been preparing APRs since the start of the NEM, the other planning arrangements in the NEM are relatively new and not fully tested. This is because AEMO only came into existence in July 2009 and the RIT-T was finalised in July 2010.

Last Resort Planning Power

The National Electricity Rules (NER or the Rules) confer upon the Australian Energy Market Commission (Commission or AEMC) a Last Resort Planning Power (LRPP). The LRPP is an oversight power designed to ensure that efficient inter-regional transmission investment occurs where this is in the long term interests of consumers. It allows the AEMC to direct registered participants to apply the RIT-T to a project which is likely to address any shortfall in inter-regional transmission investment.

The AEMC is required in the Rules to report annually on the matters that it has considered in deciding whether or not to exercise the LRPP. This document is the AEMC's report on its considerations for 2011.

Outcome of the Commission's considerations in 2011

The Commission has decided not to exercise the LRPP in 2011. In making this decision, the Commission considered the responses of the various JPBs to any inter-regional congestion issues or opportunities for inter-regional network development as outlined by AEMO in the 2009 National Transmission Statement (NTS) and the 2010 NTNDP.

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1 In addition to its national planning and market operations roles, AEMO is the JPB for Victoria.

2 Clause 5.6.5C(a) of the NER allows for exceptions where some development options need not be considered under the RIT-T. Such exceptions include smaller projects and equipment replacement.

The Commission received advice from Intelligent Energy Systems (IES) which indicated that each JPB appears to be progressing projects which adequately address all the relevant inter-regional planning issues or opportunities identified by AEMO. Accordingly, the Commission has decided that there is no material reason for the exercise of the LRPP in 2011.

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1 Introduction

1.1 What is the LRPP?

The primary mechanism for planning the transmission networks in the NEM are the APRs and the NTNDP, which are prepared by the JPBs and AEMO respectively. The APRs describe the network development plans for each of the individual state transmission networks, while the NTNDP aims to provide coordination between the APRs of the individual jurisdictions and a long-term vision for the development of the NEM transmission network.

When these arrangements were first put in place there was a concern that there may be insufficient incentives on AEMO and the JPBs to adequately consider inter-regional network developments.[3] Therefore, the AEMC was given a last resort power with respect to inter-regional transmission network planning.

The LRPP is defined in chapter 5.6.4 of the Rules. Its purpose, as defined in clause 5.6.4(b) is to:

> "...ensure timely and efficient inter-regional transmission investment for the long term interests of consumers of electricity"

Specifically, clause 5.6.4(c) of the Rules defines the LRPP as allowing the Commission to direct any registered participant:

> "(1) to identify a potential transmission project and apply the regulatory investment test for transmission to that project; or
>
> (2) to apply the regulatory investment test for transmission to a potential transmission project identified by the AEMC"

It is important to note that the power is not a power to direct that investment occurs, but to direct that the RIT-T is applied to a project which is designed to address an identified problem.

The LRPP is intended to be applied to addressing material constraints that are forecast to affect national transmission flow paths between regional reference nodes. The Commission considers that this refers to all constraints which are likely to have an impact on inter-regional power transfers, regardless of their physical location in the meshed network.

3 Ministerial Council on Energy, Transmission Last Resort Planning Rule change proposal, 12 October 2005.

1.2 What are the Commission's Rules obligations in regards to the exercise of the LRPP?

The Rules require the Commission to report annually on the matters that it has considered in that year in deciding whether or not to exercise the LRPP.

In conducting its assessment of whether there is a need to exercise the LRPP, clause 5.6.4(g) of the Rules requires the AEMC to consider:

> "(1) [any] advice provided by AEMO;
>
> (2) the NTNDP for the current and previous year;[4]
>
> (3) Annual Planning Reports published by Transmission Network Service Providers; and
>
> (4) other matters that are relevant in the circumstances."

The Commission considers that, while the Rules allow for the AEMC to request advice from AEMO, this would only normally take place where the AEMC had identified a specific problem where further, more detailed analysis was required. The Commission did not consider it necessary to request advice from AEMO.

The Rules also define a number of criteria related to the exercise of the LRPP. Clause 5.6.4(h) of the Rules specifies that before it can exercise the LRPP, the AEMC must:

> "(1) identify a problem relating to constraints in respect of national transmission flow paths between regional reference nodes or a potential transmission project (the problem or the project);
>
> (2) make reasonable inquiries to satisfy itself that there are no current processes underway for the application of the regulatory investment test for transmission in relation to the problem or the project;
>
> (3) consider whether there are other options, strategies or solutions to address the problem or the project, and must be satisfied that all such other options are unlikely to address the problem or the project in a timely manner;
>
> (4) be satisfied that the problem or the project may have a significant impact on the efficient operation of the market; and
>
> (5) be satisfied that but for the AEMC exercising the last resort planning power, the problem or the project is unlikely to be addressed."

4 As only one NTNDP had been released by AEMO at the time of assessment, the AEMC considered the 2010 NTNDP and the 2009 NTS.

2 The AEMC's LRPP assessment approach in 2011

2.1 A three-staged approach

As highlighted above, the AEMC is required to report annually on the matters it has considered in deciding whether or not to exercise the LRPP. In order to inform this decision, the Commission designed an assessment approach for 2011 which consisted of three stages. Progression from one stage to the next was dependent on the findings of the preceding stage.

Stage 1 involved a broad assessment of the outcomes of the planning processes across the NEM. The purpose of this assessment was to identify forecast inter-regional congestion problems or inter-regional investment opportunities described by AEMO in the NTNDP and NTS, and to determine whether the various JPBs were actively progressing projects in response to these identified problems or opportunities.

In making this comparison, this stage of the assessment sought to determine whether there was a planning "gap" where AEMO's recommendations were not being satisfactorily addressed by JPB responses. If the assessment identified such a gap, a recommendation could be made to progress to Stage 2 of the assessment.

Stage 2 would involve a more detailed examination of the identified gap. If this examination confirmed that the inter-regional congestion problem or planning opportunity was of material significance and unlikely to be addressed by the relevant JPB, the project could progress to Stage 3.

Stage 3 of the project would involve extensive consultation with relevant stakeholders and potentially the development of a direction notice under the LRPP.

As per its definition, the LRPP is a last resort exercise, designed only to be utilised where there is clear evidence of a failure of the planning frameworks to deliver efficient outcomes. Accordingly, the Commission considered that clear and concise evidence would need to be available before the assessment would progress from one stage to the next.

2.2 Engagement of Intelligent Energy Systems

The Commission was assisted with this review by an initial analysis undertaken by IES.

2.3 AEMC Report

This report presents the considerations undertaken by the AEMC in deciding whether or not there is a need to exercise the LRPP in 2011.

It includes an overview of the AEMC's statutory obligations in regards to the exercise of the LRPP, a description of the AEMC's assessment process and the central findings of this process which informed the AEMC's final decision.

2.4 IES report

The Commission has also published a report by IES entitled "Assessment of inter-regional congestion". This report contains further detail of the analysis which helped inform the AEMC's decision and should be read in conjunction with this report.

3 Assessment for 2011

The AEMC has decided not to progress its assessment to Stage 2 and not to exercise the LRPP in 2011.

3.1 Congestion in the NEM

As outlined by IES, inter-regional constraints are often mistakenly perceived only to occur at the physical boundary between regions. However, due to the meshed nature of the transmission network, constraints in almost any part of the meshed network can affect flows between regions.

IES suggested that a better definition of an "inter-regional constraint" was any constraint equation which explicitly referred to an interconnector.[5] IES showed that, excluding constraints related to ancillary services, around 67% of all constraint equations met this definition.

This figure highlights the fact that congestion anywhere on the network has the potential to affect inter-regional flows. Accordingly, planning processes need to consider the market wide effect of congestion when developing the network.

3.2 Review of the NTS and NTNDP

In assessing the NTS and NTNDP, IES highlighted the key opportunities for inter-regional development identified in those documents.

The 2009 NTS considered a number of "conceptual augmentations". Two of these were subject to detailed study in the NTS market simulations:

- QNI series compensation; and
- QNI series compensation, a Loy Yang braking resistor and a Hunter Valley to Goldcoast 500kV line development.

Both of these augmentation sets demonstrated market benefits under low and high carbon pricing scenarios, though the benefits of the second set was reduced under a high carbon price scenario.[6]

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5 Constraint equations contain a number of terms on the left hand side (LHS) of the equation, which are those terms which can be adjusted by the NEM dispatch engine to control the power system. Accordingly, where an interconnector term appears on the LHS of a constraint equation, flow on that interconnector may be affected when the relevant constraint is binding.

6 While the 2009 NTS identified two conceptual augmentations relating to QNI upgrade, the second of these (which included the Loy Yang braking resistor and the Hunter Valley to Gold Coast 500kV line development) was not prioritised by the more detailed modelling of the 2010 NTNDP. Accordingly, IES has focused on the findings of the more recent analysis.

The 2010 NTNDP undertook high level modelling of the NEM, considering future transmission congestion, augmentation and generation investment under 10 different scenarios.

A number of specific inter-regional augmentation opportunities were identified under the NTNDP analysis, with recommended time frames for development. Of these high level augmentation opportunities, only one, related to development of the QNI interconnector between New South Wales and Queensland, was selected for early attention.

3.3 Review of Annual Planning Reports and other planning activities

A summary of each jurisdictional APR was also provided by IES. This summary stepped through the proposed augmentations as described in each APR, as well as other planning processes being undertaken by the various JPBs.

These augmentations and planning processes were then compared to the high level suggested augmentations described in the NTNDP.

It is worth noting that the single project where early attention was recommended by AEMO in the NTNDP (upgrade of QNI) is currently being addressed as a prioritised project by the relevant JPBs. Additionally, JPBs are actively progressing a number of projects related to AEMO's findings on augmentations related to power transfers between New South Wales and Victoria, as well as South Australia and Victoria.

Table 3.1 below compares the high level augmentations identified in the NTNDP with the responses to each as discussed in each APR, or through other planning processes.

Table 3.1 Summary of interconnector upgrades recommended by the 2010 NTNDP and JPB responses

Inter-connector	NTNDP timeframe	NTNDP suggested augmentation	Drivers	JPB response
QNI	Early attention	Series compensation on Armidale-Dumaresq 330kV circuits and Dumaresq-Bulli Creek 330kV circuits	NSW exporting to QLD during high demand, QLD exporting to NSW during lower demand	Powerlink and TransGrid have commenced an investigation of the economic viability and optimum timing of various upgrade options to the QNI interconnector based on the methodology of the RIT-T.
Vic-NSW	Preparatory work	Installing a phase shifting transformer (TX) on the 220kV Buronga-Red Cliffs circuit.	High power exports from Vic to SA over Murraylink	The NSW 220kV system has a relatively high thermal rating compared to the voltage control capability. The feasibility of a phase shifting transformer (PST) installation is under investigation. TransGrid and AEMO will investigate the impacts of high Murraylink power transfers on the NSW and Victorian systems in the Buronga – Red Cliffs area.
Vic-NSW	Preparatory work	Additional transformers at Dederang and South Morang, a phase angle regulator on the Jindera-Wodonga circuit and series capacitors on the Eildon-Thomastown and Wodonga-Dederang circuits. Uprating the Eildon-Thomastown and South Morang-Dederang circuits, and cut-in of the Rowville-Thomastown circuit.	Increased NSW to Vic exports during low demand	Network options being considered include: • Installation of additional capacitor banks and controlled series compensation at Dederang and Wodonga Terminal Stations. • Up-rating the two existing lines between Dederang and South Morang to 82degC operation and series compensation • Installing a new (third) 330 kV, 1,060 MVA line between Dederang and South Morang with 50% series compensation to match the existing lines (subject to obtaining the necessary easement). • Installing a new (third) 330 kV, 1,060 MVA line between Murray and Dederang (subject to obtaining the necessary easement).

				• Installing a new (second) 330 kV line from Dederang to Jindera. This option requires widening the existing easement between Dederang and Jindera. Up-rating transmission lines in New South Wales will also be required.
Vic-SA	None given	Additional transformers at Heywood and South East substations, a shunt capacitor bank at the South East substation and utilisation of line design ratings for relevant circuits in the SESA zone and Eastern Hills. Previous augmentation for Vic-SA (shown above) as well as series compensation on 275kV Tailem Bend-South East circuit.	Increased renewable generation in SA exporting to Vic during non-peak load conditions	AEMO and ElectraNet to undertake RIT-T study of Heywood upgrade in 2011/12.

IES also provided some commentary on the way in which the various JPBs prepare their APRs. In particular, it was noted that there is significant variability between APRs in regards to how:

- the physical network is graphically represented;
- current network performance is reviewed and described;
- short, medium and long term network limitations and projects are described; and
- APRs respond to the findings of the NTNDP.

More generally, IES noted that conducting a NEM-wide review of transmission planning is hampered by the lack of consistency in approaches adopted by the various JPBs in developing their APRs. Accordingly, there is likely to be some benefit gained in streamlining and co-ordinating the way in which APRs are developed and presented.

3.4 Conclusion

IES concluded that there were no gaps between AEMO's identification of projects and JPB responses, and recommended that there was no need for the AEMC to exercise the LRPP in 2011.

Having been informed by IES' assessment, the Commission has decided that all relevant high level inter-regional development projects identified by AEMO are being satisfactorily addressed by the relevant JPBs. This includes those projects identified by AEMO as warranting early attention, as well as other lower priority projects.

4 Commission decision

When developing its approach to deciding whether there was a need to exercise the LRPP in 2011, the Commission began with identifying what obligations it must satisfy when undertaking its LRPP role. As discussed above, this involved consideration of various documents prepared by AEMO and the JPBs. Accordingly, Stage 1 of the Commission's approach involved a comparison of these documents, in order to determine whether there was any gap between the recommendations made by AEMO and the responses to these recommendations made by the various JPBs.

Each of the projects proposed by AEMO has been compared to the relevant APR responses. The Commission considers that this comparison clearly demonstrates that there are no significant gaps between the high level planning recommendations made by AEMO and JPB responses to these recommendations.

IES' analysis has informed and supports the Commission's findings. IES have also found that there do not appear to be any areas in the NEM where further, more detailed analysis is required.

Having considered all of these factors, the Commission has decided that there is no need to progress to the next stage of the analysis, and that there is no need for the exercise of the LRPP in 2011.

Abbreviations

AEMC	See Commission
AEMO	Australian Energy Market Operator
APR	Annual Planning Reports
Commission	Australian Energy Market Commission
IES	Intelligent Energy Systems
JPBs	jurisdictional planning bodies
LRPP	Last Resort Planning Power
NER	See the Rules
NTNDP	National Transmission Network Development Plan
NTS	2009 National Transmission Statement
RIT-T	Regulatory Investment Test for Transmission
the Rules	National Electricity Rules