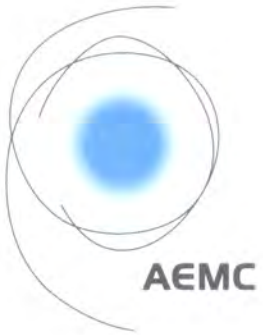

Australian Energy Market Commission

Congestion Management Review

Final Report

June 2008

Signed: .....

John Tamblyn
Chairman
For and on behalf of
Australian Energy Market Commission

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About the AEMC

The Council of Australian Governments, through its Ministerial Council on Energy, established the Australian Energy Market Commission (AEMC) in July 2005 to be the Rule maker for national energy markets. The AEMC is currently responsible for Rules and policy advice covering the National Electricity Market. It is a statutory authority. Our key responsibilities are to consider Rule change proposals, conduct energy market reviews and provide policy advice to the Ministerial Council as requested, or on AEMC initiative.

Foreword

The Australian Energy Market Commission is pleased to submit its Final Report on the Congestion Management Review for consideration by the Ministerial Council for Energy (MCE).

We were asked by the MCE to undertake this Review in October 2005, with a view to identifying ways of improving the ability of market participants to manage risks resulting from congestion on the transmission networks. We have consulted widely with stakeholders through the course of this Review, and analysed a wide range of evidence and policy options.

The Final Report, together with the work we will shortly complete for the MCE on national transmission planning arrangements, brings to a close a significant programme of reform to wholesale market and transmission Rules for the National Electricity Market (NEM) over the past three years. A result is a Congestion Management Regime which promotes efficiency, and is proportionate to the materiality of congestion in the NEM historically.

The Final Report also foreshadows a new phase of review and potential reform, as market participants and policy makers seek to understand the implications of policy responses to climate change for the economics and future performance of the NEM. Any path to reduce Australia's CO_2 emissions will necessarily involve the NEM and other energy markets to a significant degree. The foundation of the NEM is a regulatory framework based on effective competition and sound regulation of monopoly businesses, which promotes safe, secure and efficient supplies of electricity to consumers. It is important that we continue to scrutinise the ability of our market Rules to integrate new policy instruments, and the changes in market behaviour that such policies will elicit, to continue to promote these positive outcomes for consumers. I would hope that the Australian Energy Market Commission can make a valuable contribution to this process.

John Tamblyn

Chairman

Contents

Executive summary

This is the Australian Energy Market Commission's (AEMC) Final Report on its Congestion Management Review (the Review). The Final Report:

- describes the framework (the "Congestion Management Regime") for understanding and managing congestion in the National Electricity Market (NEM);.

- recommends to the Ministerial Council for Energy (MCE) specific changes to the National Electricity Rules that will improve the management of transmission congestion in the NEM. These recommendations build on a range of congestion management reforms already being implemented; and

- looks beyond the immediate MCE Terms of Reference for the Review and sets out key issues and drivers for change likely to impact on the Congestion Management Regime in the future.

The Terms of Reference for this Review required that we develop arrangements to improve the management of physical and financial trading risks associated with material transmission congestion. We were also tasked with developing a location-specific interim constraint management mechanism for managing material constraint issues until such time as they are addressed through investment or region boundary change. Furthermore, the MCE stipulated that a nodal approach to pricing is not appropriate at this stage of market development.

Context

This Report is one part of a wider and ongoing suite of reforms to the regulatory framework for the wholesale market and transmission. This wider suite of reforms impacts both the emergence and management of transmission congestion. It includes:

- regional boundary reform to the Snowy region to address the one significant, enduring and material point of congestion in the NEM;

- amendments to the Rules to introduce a new process for managing region boundary changes in the future;

- amendments to the Rules to establish a new Last Resort Planning Power (LRPP) to address the risk to the market of significant planning failure by Transmission Network Service Providers (TNSPs); and

- a new framework for the economic regulation of transmission (amendments to Chapter 6A of the Rules).

The current phase of the reform process will conclude with our review of national transmission planning arrangements, which later this year will deliver recommendations to the MCE on: an implementation plan to establish a National Transmission Planner; amendments to the Regulatory Test; and the establishment of

a framework for establishing greater consistency across the NEM in transmission planning standards for reliability.

Recommended Rule changes

In response to the Terms of Reference, we are recommending to the MCE four specific Rule changes to improve the arrangements for managing financial and physical trading risks associated with material network congestion. The changes focus on enhancing the quality of information available to market participants to help them understand the risks associated with congestion, and on improving the effectiveness of risk management instruments. The changes, if implemented, will:

- formalise in the Rules NEMMCO's use of fully co-optimised network constraints for the purposes of dispatching generation and Market Network Service Providers;

- amend the Rules governing the funding of negative settlement residues so as to reduce uncertainty for holders of Inter-Regional Settlement Residue (IRSR) units;

- establish a new Congestion Information Resource (CIR), to be published by NEMMCO, which will consolidate and enhance existing sources of information relevant to the understanding and management of congestion risk; and

- clarify and strengthen the Rules governing the rights of generators who fund transmission augmentations as a means of managing congestion risk, so that in the future connecting parties make a contribution to those funded investments from which they will benefit.

Congestion and wholesale market pricing

In the NEM, the market and system operator NEMMCO dispatches the market every five minutes with the objective of minimising the cost of dispatch based on bids and offers from generators and larger load customers.[a] A generator therefore faces a risk that it might not be dispatched for its desired output. This is physical (or "dispatch") risk. A generator also faces financial (or "basis") risk to the extent that it enters into contracts referenced to prices in other regions. In other market designs generators are allocated, or can purchase, a transmission access right which affords protection against volume risk. In the NEM, a generator's "right" to use the transmission network depends on whether it is dispatched by NEMMCO or not. This is termed an "open access" transmission regime.

A regionally-priced market design has two main congestion-related policy challenges which can potentially result in decentralised decision making by market participants, which can lead to economically inefficient outcomes. First, congestion can create incentives for generators to submit bids that do not reflect costs; this is done in order to secure or avoid dispatch, i.e. to manage dispatch risk (the "dis-orderly bidding problem"). If the market is dispatched using bids that do not reflect costs, then the

[a] Dispatch is also subject to the constraint of managing the security and reliability of the power system.

dispatch may be more costly (in terms of underlying resource costs) than it needs to be.

Second, congestion, and the way it is priced in the market, can influence the locational decisions of investors (the "location decision problem"). To the extent that congestion is priced in the market, this can provide signals for the optimal timing and location of generation, network and large customer investments.

The incentives for generators to submit bids that do not reflect costs as a means of managing volume risk can be addressed by linking more closely the price a generator receives in settlement to the value of its bid. Calculating prices individually for each point (node) of the network is one means of doing this. Another method, which the MCE directed us to review, is a location-specific interim constraint management mechanism. There are many different designs for such a mechanism, but the basic framework involves (a) introducing nodal prices for generators in a designated geographical area, and (b) allocating rights to generators in the area, to be settled at the RRP. If a generator is dispatched for a volume greater than its allocated rights, then it is paid its nodal price for the surplus generation. This encourages a generator to submit bids that more accurately reflect underlying resource costs.

While in a location-specific and time-limited manner a constraint management mechanism does address the "dis-orderly bidding problem", its presence is unlikely to be the determining factor in investment decisions, and therefore it will not resolve the "location decision problem". A location-specific interim constraint management mechanism is inherently uncertain and short-term. Decisions on long-term investment—for example, whether to finance a project and, if so, what project and at what cost—will instead be dominated by the other, more enduring price and non-price signals that already exist in the market. These include price differences between regions, the prospect of changes to pricing regions, transmission losses, volume risk, connection and other negotiated transmission costs, proximity and access to the electricity grid, and proximity to transport infrastructure for generation fuel sources. Importantly, it is how these signals combine, rather than the form or strength of a particular individual signal, that matters when assessing their impact on the efficiency of outcomes for consumers.

In conclusion, we are not persuaded that a location-specific interim constraint management mechanism will promote the National Electricity Objective at this stage, given the prevailing patterns and economic materiality of congestion. Analytical work by the Australian Energy Regulator (AER) and by us suggests that productive inefficiencies from dis-orderly bidding have been relatively minor to date. In addition, empirical research from NEMMCO shows that congestion has tended to be transitory and influenced significantly by network outages, hence it would be difficult to target exactly where localised pricing interventions should be applied.

Furthermore, the introduction of a location-specific interim constraint management mechanism would add a layer of complexity to the market design and would require the resolution of significant design issues. It would introduce more settlement prices. The entitlement for a NEM generator to be settled at the regional price for its dispatched output would be removed, and replaced with another form of entitlement. The entitlement is important because it represents a mechanism for managing price risk. In some proposed designs this alternative entitlement would be

allocated using an administrative rule, while in others rights would be defined explicitly and released for sale through an auction. The introduction of firm transmission rights for generation would involve fundamentally changing the NEM's design and would raise complex policy questions such as whether such rights should be grandfathered, auctioned or allocated on some other basis. Given the evidence to date does not show that transmission congestion has been a material problem, and given the complexities associated with designing a location-specific interim constraint management mechanism we are not persuaded that such a mechanism represents a net improvement in market efficiency at this time.

Future challenges

During the course of this Review there has been an increasing focus among stakeholders on the "location decision problem". This has revealed itself in proposals for more fundamental change to the Congestion Management Regime, including NEM-wide changes to abolish or amend the entitlement for dispatched volumes to be settled at the regional price and to introduce alternative mechanisms for managing price risk. This shift of focus reflects the need for new investment in the NEM, as well as the uncertainty over the nature of such investment in the context of climate change and policy responses to it.

The impact on the NEM of government policy initiatives in response to climate change (including the promotion of renewable energy technologies) will be profound. There are likely to be: significant amounts of new generation in remote parts of the network; closure of existing fossil fuel generation capacity; large shifts in the patterns of electrical flows across transmission and distribution networks; and new challenges for system operation and security of supply resulting from significant volumes of intermittent generation, such as wind turbines or small-scale embedded or micro generation. The pattern of these changes will be strongly influenced by policy settings, such as the details of a national emissions trading scheme, which are yet to be resolved.

These changes are likely to "stress test" the NEM's regulatory framework including the Congestion Management Regime. While further reforms to the Regime should be proportionate to the problem and have a robust analytical basis, we should be aware that even a proportionate response might involve significant reform to the regulatory framework. The changes to the underlying economics of the NEM resulting from climate change policy, and the consequent impacts on the behaviour of market participants and on what is required of the NEM's transmission networks, are potentially very large and may, among other consequences, result in the emergence of material transmission congestion.

If analysis were to indicate that material transmission congestion is likely to emerge as a consequence of changes to the underlying economics of the NEM, it is likely that there will be numerous options for reform that warrant consideration. For example, if new and stable points of material congestion emerge, perhaps as a result of timing differences between generator and network investment responses, it might be appropriate to re-evaluate location-specific interim constraint management mechanisms as a transitional device. A more extensive reform option would be the introduction of Generator Nodal Pricing (GNP) on a NEM-wide basis. GNP would solve the dis-orderly bidding problem, and would be more effective at addressing

the locational decision problem than would a localised, time-limited pricing intervention. However, it would represent a significant change to the NEM market design and would require a complete overhaul of the market architecture for managing price risk. As a companion piece to this Review we have undertaken initial but substantial analytical work on the potential application of GNP.[b]

The profound impact of policy responses to climate change on the underlying economics of the NEM suggests that it is timely to consider the case for more fundamental change. It is important of course that any such review be comprehensive and integrated; the complexity of the interactions, and the consequent risk of unintended consequences, mean that partial approaches are unlikely to deliver optimal outcomes. The review should be based on empirical evidence and robust analysis, and informed by effective and inclusive consultation with stakeholders.

A comprehensive review would consider the need for modifications to the energy market design and regulatory framework to ensure that the impacts of climate change policies on the NEM can be accommodated efficiently and at least cost. Such a review would need to address issues including:

- the likely nature and extent of the impact of climate change policies on the structure, economics and performance of the NEM;
- the identification of any elements of the NEM regulatory framework that may require incremental or more fundamental change to accommodate the impacts of climate change policies; and
- the identification and assessment of feasible options for change to the energy market design and regulatory framework to facilitate the integration of climate change policies with the continued efficient operation and performance of the NEM.

The diagram below represents what the Congestion Management Regime will look like in the NEM—if the recommendations in this Final Report as well as recommendations from related work in the National Transmission Planner review are implemented. The diagram also identifies areas where it will be beneficial in the future to consider how climate change policies may interact with and impact on the NEM's regulatory framework.

Building upon the congestion management reforms already being implemented, this Final Report together with its recommendations for incremental improvements to the Congestion Management Regime provide important direction on the nature and scope of the priority areas for future review and reform in the context of climate change policies.

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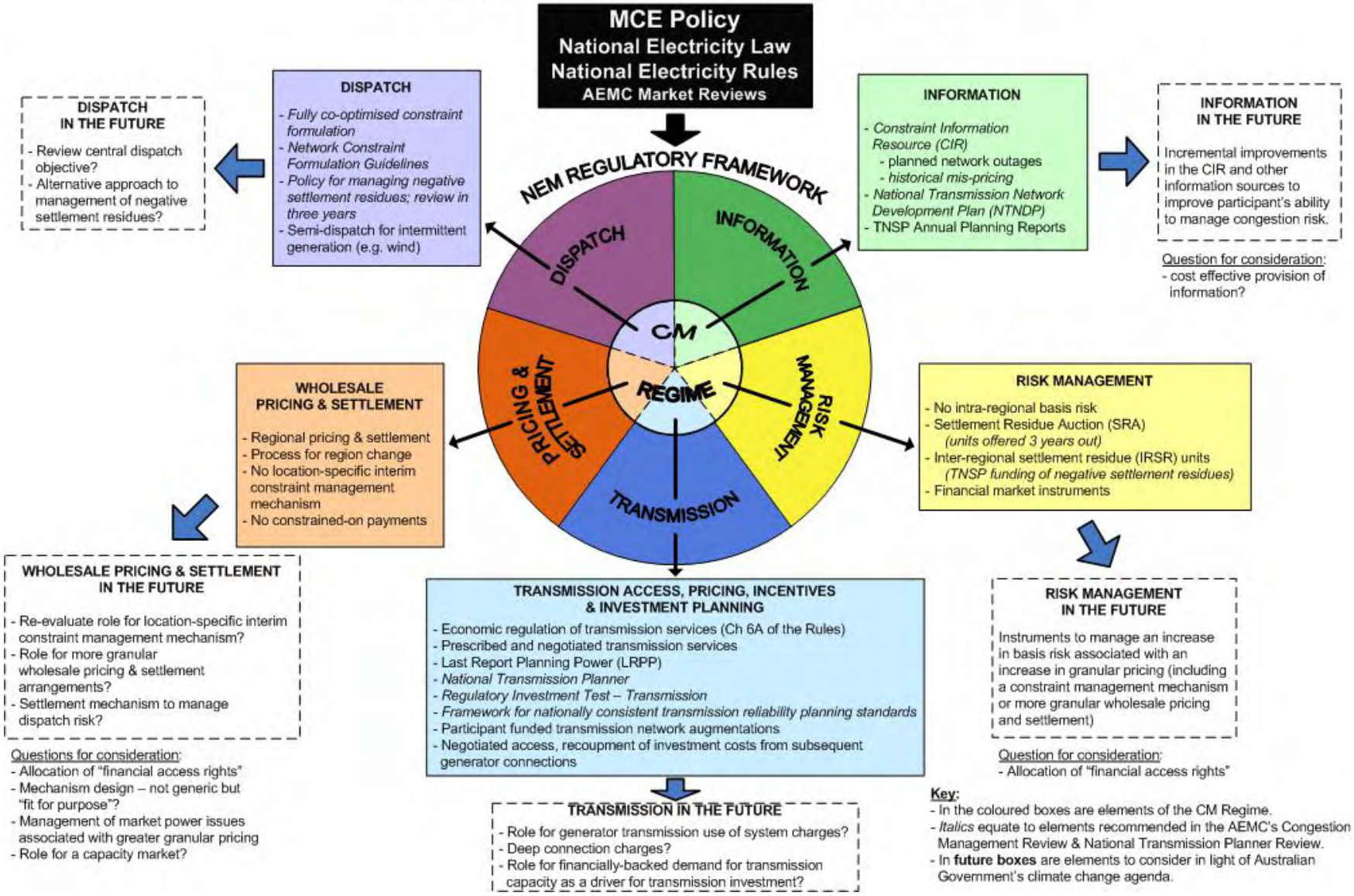
b We commissioned Frontier Economics to undertake a review on the potential application of GNP. We also had Professor Grant Read of EGR Consulting provide a peer review of the Frontier Economics report. These supplementary papers are available on our website: www.aemc.gov.au.

What does the Congestion Management Regime look like in Australia's National Electricity Market?



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