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Transmission Frameworks Review

Executive Summary

The Region market design and the existing regulatory transmission frameworks in the NEM have more than satisfactorily served the long term interest of consumers by delivering investment in generation and transmission. There is no quantifiable evidence to suggest that these frameworks would not continue to work and signal new generation and transmission investments in the future. Some recent refinements to these frameworks should further advance the NEM objective.

From past reviews the AEMC has in place a systematic approach to deal with congestion. This approach involves assessing the persistence and materiality of the congestion, consider applying an interim and location specific congestion management regime to deal with material but not permanent congestion, assessing whether the constraint can be built out with transmission, and applying a new Region boundary where the congestion is material and persistent and cannot be economically built out. This approach is logical, appropriate, and consistent with the NEMs market design and regulatory arrangements.

All available evidence shows that constraints have a short life cycle of 2 to 3 years. There are also complex implementation issues associated with a localised and time limited congestion management regime. Further to this, a congestion management regime is likely to have perverse and negative impacts on the functioning and liquidity of the Contracts market. In short, we believe the risks and costs of introducing any interim constraint management regime would far outweigh the questionable benefits of a reduction in mis-pricing. Hence within this existing approach we are doubtful whether an interim and location specific congestion management regime is required at all.

Snowy Hydro is a signatory to the Northern Generators submission on this Issues Paper. We will not repeat the views expressed in the Northern Generators submission. As highlighted in this Executive Summary, Snowy Hydro's submission instead will focus at a high level on the nature of access (question 7) and the dispatch of the market and management of congestion (question 10).

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1 The Regional Market Structure and Transmission and Access Arrangements

This section provides some context to the issues raised in Question 7 – Nature of Access.

It is worth looking at the background of the NEM's Regional market structure and the transmission frameworks associated within the NEM market design to get a reference point for debate on potential changes.

The NEM is a Regional market design where energy is settled based on a generators Regional Reference Price (RRP). There is no explicit transmission right for any generator that effectively guarantees payment of its energy at the RRP. However, there is an implied right to settle at the generators RRP by virtue of the fact that energy is settled based on the generators RRP adjusted for losses.

In summary the NEM has an Open Access regime with no explicit transmission rights. Some Generator Participants have recently advocated that the lack of explicitly allocated transmission rights is "unfinished business". However, Snowy Hydro believes this view conveniently ignores the competing trade-offs that were inevitably made with the establishment of the NEM.

These competing issues / trade offs included whether the market was fully nodal versus regional, market power considerations, contract market considerations, and who paid for the shared transmission network.

Since the inception of the NEM in 1998 this current market design has delivered new generation investment, transmission development has evolved to changing patterns of transmission flow, and the NEM has overwhelmingly met reliability standards.

There appears to be nothing new in this review that has not already been considered at great length in the Congestion Management Review (2008) and the Energy Frameworks Review (2009). However, Snowy Hydro is concerned that some potentially very fundamental changes to the energy and transmission frameworks are being contemplated in this current review. We must ask ourselves, what has changed since these past reviews that may warrant fundamental changes to these frameworks which have served the NEM well.

The available evidence suggests nothing has fundamentally changed to warrant fundamentally changing the existing energy and transmission frameworks.

- There's been 3900MW of committed / advance generation investment in 2009;
- TNSPs are also investing in transmission infrastructure; and
- congestion costs are decreasing.

If the AEMC was to consider moving down the track to a CSP/CSC type arrangement or any similarly nodally priced market, these arrangements simply cannot be made workable on a holistic basis without addressing the very vexed issue of transmission property rights. Accordingly, there are significant costs to moving to such a fundamentally changed arrangement (including abandoning the current "open access" regime). Hence, the benefits would need to be very certain and economically significant to justify change.

Snowy Hydro does not see any evidence to warrant wholesale changes to the existing frameworks. In fact, Market Participants desire a period of regulatory stability especially in light of the uncertainty that exists with carbon pricing policy. In our view it does not make economic sense to make fundamental changes to the existing frameworks on the basis of highly uncertain climate change policies.

2 The Relevance of Past Related Reviews

There exists a thoroughly considered policy approach to deal with congestion within the current energy and transmission frameworks that was first developed as a result of the Congestion Management Review.

Broadly the existing approach can be described as:

- Is there material congestion?
- If it's material but transitionary then consider an interim and location specific constraint management regime;
- If congestion is material and not transitionary then can the constraint be built out through transmission investment?
- If the constraint cannot be built out through transmission investment then change the Region Boundary.

Importantly this approach was derived from analytical work by investigating the actual level of congestion in the NEM. In was underpinned by observed outcomes in the NEM. The existing approach is supported by the following fundamental features of the NEM.

- The NEM is a Regional market with generators possessing implicit rights to its Region Reference Node when it is dispatched. No market participants have explicit transmission rights to its Region Reference Node;
- Generators pay for shallow transmission access (that is Connection Assets).
- Generators do NOT pay for TUOS for the Shared Transmission Assets;
- The Rules provide for generators to negotiate different levels of connection service. This may involve a generator agreeing to fund deeper reinforcement work on the shared transmission network in return for reduced dispatch risk.

We believe these fundamental features of the NEM are economically sound and strike the right balance for short term productive (dispatch efficiency) and long term dynamic efficiency.

We believe the existing approach to deal with congestion is sound and in the absence of demonstrable and material problems associated with this approach, should not be modified. The approach balances the need for regulatory predictability and stability and the need to make changes if congestion is shown to be material.

The AEMC have stated that it believes congestion may become more of an issue with climate change policies. We caution against making fundamental changes to current arrangements to a transitionary issue at best. We believe the current approach coupled with recent reforms to the National Transmission Planner, Amended RIT-T, inter-regional transmission charging, better information resource through the congestion information resource, improved the SRA process, and TNSP performance incentive schemes are all enhancements and therefore mitigate the risk of material congestion being unaddressed. Further to this we believe the TNSPs incentives remain to build out congestion if it is economically feasible to do so.

In summary, Snowy Hydro sees no evidence to warrant changing this regulatory approach to dealing with transmission congestion. In fact climate change policies are sufficiently uncertain that it does not make sense to change the energy and transmission frameworks to a suite of climate change policies that are highly uncertain and subject to ongoing political adjustment. Any fundamental change to the existing frameworks would add additional uncertainty and in our view would be simply counter productive.

3 Dispatch of the market and the management of congestion

This section explores Question 10 – Dispatch of the market and management of congestion in the Issues Paper.

3.1 Mis-pricing and Inefficient Dispatch

It has been well documented that in the regional market design, generator offers for dispatch may not reflect its underlying marginal cost when there are transmission constraints. Hence it can be argued that a localised price applied when the constraint binds may increase dispatch efficiency at the margin.

However, the AEMC's own analysis indicates that the dispatch inefficiency costs associated with mis-pricing and "dis-orderly" bidding has been relatively low. The analysis undertaken for the Congestion Management Review by Frontier Economics indicated that dispatch inefficiencies were in the order of only $8 million per year[1] (for the 2007/08 financial year). This is a negligible amount compared to the overall market turnover of over $8 billion per year.

We don't see the materiality of inefficient dispatch increasing. A carbon price should in fact narrow the fuel price differential between different fuel types thereby decreasing the resource cost of mis-pricing and inefficient dispatch.

Further to this, since the abolition of the Snowy Region, there exists three large hydro storages in the two largest load centres in the NEM. Tumut generation is located in NSW, Murray generation and Southern Hydro generation located in Victoria, and Hydro Tasmania's hydro generation can access the Victorian region through Basslink. The significance of this observation is that these large hydro storages across the two largest NEM regions have almost identical opportunity costs and hence from an overall dispatch efficiency perspective the total resource cost from mis-pricing across the NSW and VIC regions should be reduced with the generation from these diverse hydro sources not increasing the overall resource cost.

3.1.1 A Stylistic Approach to Quantifying the Economic Cost of Inefficient Dispatch

Appendix A of the submission presents a stylistic approach to quantifying the economic cost (static efficiency) of inefficient dispatch due to mis-pricing.

The analysis shows the total economic cost of mis-pricing using current Short Run Marginal Cost (SRMCs) compared to the same economic costs using SRMC which incorporate a carbon price.

The analysis found that the total economic cost of mis-pricing **reduces** when a carbon price is introduced. This finding is consistent with our assertion that the economic cost of mis-pricing would in fact reduce due to the carbon price equalising/narrowing the SRMCs across all generation technologies.

The results confirm that the economic cost of mis-pricing reduces with carbon pricing. Put another way, with the introduction of carbon pricing the economic cost and impact

[1] Frontier Economics, Modelling for AEMC in the Congestion Management Review 2008.

of binding constraints is 2.5 times less than the impact of mis-pricing that exists in the current market with no carbon pricing.

In summary, this analysis shows that the economic cost of mis-pricing is negligible compared to the market turnover of $8 billion per annum. If carbon pricing is introduced this economic cost becomes even less significant. Hence, there is no justification for an interim and location specific constraint management regime to rectify mis-pricing in the current NEM and certainly even less justification for a constraint management regime if carbon pricing were to be introduced.

3.2 Lessons from the Snowy Region Abolition Rule Change and its relevance to Spot market efficiency

The final determination on the Snowy Region Abolition makes some very relevant conclusions to support the current region market design. From the Rule determination it was established that a more granular nodal price may resolve mis-pricing but this does **NOT** necessarily mean that dispatch efficiency is improved.

In the Snowy Region Abolition rule change the competing alternatives that the AEMC were assessing against the Snowy Hydro proposal were the Split Snowy region and the Southern Generator's CSP/CSC proposal. Both these alternative proposals would have resulted in Snowy Hydro's power stations receiving a more granular (nodal) price.

The risk and inefficiency associated with more granular price was well articulated by the AEMC[2]. These include:

> … *generators facing a local nodal price may find it profitable to* ***withhold production (or maintain "headroom") in order manage their basis risk*** *by preventing constraints from binding that might otherwise reduce their own settlement price. To the extent withholding occurs, it may diminish or reverse the productive and dynamic efficiency benefits of greater pricing granularity.* (empathises added page 18)

The AEMC on page 21 of the determination states that:

> *The incentives for Snowy Hydro to maintain headroom are driven by both the potential to maximise revenue across its generation output by accessing a relatively higher price, and the potential to manage basis risk by minimising interregional price separation (as discussed in Section 4.1 and 4.4 of the Rule Determination). Once again, it is unclear from a conceptual analysis if these alternatives would lead to more efficient dispatch outcomes compared to the Abolition proposal. The Commission has undertaken quantitative modelling to inform its analysis.*

The Commission's quantitative modelling, presented in Appendix B, demonstrates that while all the proposals result in dispatch efficiency improvements relative to the base case, the Abolition proposal produced the most efficient dispatch outcome (page 21). This observation is important as it demonstrates quantitatively that the **Region market alternative** (ie. proposal advocated through the Snowy Region Abolition) resulted in more efficient dispatch than the two competing proposals which had a more granular (nodal) price. This is because the economic costs to the market as a result of withholding generation capacity maintain headroom exceeded the efficiency gains from receiving a more nodal price.

[2] AEMC Snowy Region Abolition of Snowy region, Rule Determination, 30 August 2007.

3.3 The risks to the Contract market from introducing a congestion management regime

We have highlighted the difficulties and risk of implementing a congestion pricing regime such as the CSP/CSC in previous submissions to the Energy Frameworks Review. In brief we see the risks to **both** the Spot market and contract market from the implementation of a congestion pricing regime would far outweigh any questionable efficiency benefits from receiving a more granular price.

Any congestion management regime will increase the complexity of operating in the NEM and increase basis risk for Contract market participants. The efficient functioning of the Contracts Market must be a major consideration given that approximately 85 to 95 of a generators annual production are sold forward in the Contract market. This assertion is backed by an industry survey done by PWC titled, "Independent survey of contract market liquidity in the National electricity Market, October 2006, commissioned by the National Generator Forum and the Energy Retailers Association."

> ***Inter-regional Risk and Regional Liquidity (page 28).***
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> *Most respondents (15 of the 17 surveyed) are comfortable that they can adequately manage inter-regional risk, either through SRAs or financial swaps. Views were mixed on the effectiveness of the SRA as a risk management tool, with some respondents happy to internalise the lack of firmness, seeing this as no different to managing the non-firm risk of a power station, whereas others perceived that a firming up of SRA's would increase their appetite to trade cross border.*
>
> *A number of respondents cited the levels of inter-connector capacity as a constraint to further liquidity and a more efficient national market. This viewpoint corresponds with views expressed in a previous survey.*
>
> *It is generally accepted that **an increase in the number of price nodes would likely reduce the level of liquidity in the market. Some respondents believe that any additional level of complexity brought about by increasing the number of nodes would be too much for the market to manage.** It was quoted that the amount of information and prices currently in play is already complex and time consuming to assimilate, with participants often concentrating on select regions and products that best fit with their strategies.*

Our overall position in relation to interim constraint management is that dispatch efficiency may not increase and could in fact perversely decrease. The benefits derived from a finer granular pricing may not exceed the additional complexity and risk that comes from having to manage pricing risk as a result of receiving the local nodal price instead of the region reference price. This is a very important point as the bulk of energy in the market is transacted in the contracts market. The addition of a local node price increases the risk to contracting and hence overall contract market liquidity and competition would be adversely affected.

4 Conclusion

In summary Snowy Hydro does not see any evidence to justify refining existing locational signals in the NEM. The NEM and its associated regulatory frameworks for transmission have served the long term interest of consumers by delivering new generation and transmission investment. There is no evidence to suggest that these frameworks will not continue to work in the future.

Previous modelling undertaken has confirmed that the economic cost of mis-pricing is immaterial. If and when carbon is priced in the market this mis-pricing economic cost must become a much smaller percentage of the markets turnover since a carbon price will reduce the difference in fuel costs across different competing generation technologies. Hence, there is no justification for a interim and location specific constraint management regime.

Snowy Hydro appreciates the opportunity to respond to this consultation. Please contact Kevin Ly, Manager Market Development and Strategy on (02) 9278 1862 if you would like to discuss any issue associated with this submission.

Yours sincerely,

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Appendix A: A Stylistic Approach to Quantifying the Economic Cost of Inefficient Dispatch

This appendix presents a stylistic approach to quantifying the economic cost of inefficient dispatch due to mis-pricing.

The results are based on the following assumptions:

NEM Wide Summer Max Demand (MW)	34,282
Hours of Constraint (2%)	175
Carbon Price ($/tCO2e)	30

Generation Sources	Duration Factors	Carbon Intensity (tCO2e/MWh)
Wind	2%	0
Brown Coal	24%	1.4
Black Coal	54%	0.9
CCGT	15%	0.4
OCGT	5%	0.7
Total	100%	

The quantification methodology assumes that in the presence of mis-pricing higher cost generation technologies displace lower cost technologies. That is, when congestion arises in the NEM, brown coal displaces all the output of wind, black coal displaces all the output of brown coal, combined cycle gas turbines displaces all the output of black coal, and open cycle gas turbines displaces all the output of combined cycle gas turbines. The economic dispatch cost due to this mis-pricing is then calculated. This is done for existing Short Run Marginal Costs (SRMC) and compared to the SRMC which incorporates a Carbon price. The results[3] are shown in the following table.

	Generation Technology					
	Wind	Brown	Black	CCGT	OCGT	Total Mis-price (Dispatch) Cost ($m)
SRMC Cost	0	3	13	30	55	
SRMC Economic Cost of Mis-pricing ($m)		$0.4	$14	$55	$23	**$92**
SRMC with Carbon cost	0	45	40	42	76	
Economic Cost of Mis-pricing ($m)		$5	-$7	$6	$31	**$35**

The results show that the total economic cost (static efficiency cost) with current SRMCs is approximately $92 million per annum. This number is very conservative since we have assumed that all generation in each category is displaced in its entirety by the next higher cost generation technology in the presence of constraints that cause mis-pricing. In reality, this economic cost would be much lower and would be in the order of $8 million as shown by Frontier Economics in their quantification of economic costs due to mis-pricing performed for the AEMC in 2007.

More importantly, the total economic cost of mis-pricing **reduces** to $35 million per annum when a carbon price is introduced. This finding is consistent with our assertion that the

[3] The inputs on SRMC costs were derived from ACIL Tasman, Fuel resource, new entry and generation costs in the NEM, April 2009.

economic cost would in fact reduce due to the carbon price equalising/narrowing the SRMCs across all generation technologies.

What these stylistic results confirm is that the economic cost of mis-pricing reduces with carbon pricing. The results confirm that the economic cost of mis-pricing reduces with carbon pricing. Put another way, with the introduction of carbon pricing the economic cost and impact of binding constraints is 2.5 times less than the impact of mis-pricing that exists in the current market with no carbon pricing.

In summary, this analysis shows that the economic cost of mis-pricing is negligible compared to the market turnover of $8 billion per annum. If carbon pricing is introduced this economic cost becomes even less significant. Hence, there is no justification for an interim and location specific constraint management regime to rectify mis-pricing in the current NEM and certainly even less justification for a constraint management regime if carbon pricing were to be introduced.