24th May 2011

Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

Submission lodged online at: www.aemc.gov.au

Project Number: EPR0019

Dear Mr Pierce

Submission to: Transmission Frameworks Review
Directions Paper

Snowy Hydro Limited welcomes the opportunity to make a submission to the AEMC's Transmission Framework Review Directions Paper.

Snowy Hydro commends the AEMC's Directions Paper for taking a holistic approach to assessing the strengths and weaknesses of the existing transmission regulatory frameworks. In particular we believe that Appendix A – "What is congestion and how is it measured?" represents a good regulatory practice approach to analysing the perceived problems in existing arrangements by first objectively measuring the materiality of the perceived problem.

As highlighted in our submissions to date we believe the governance and investment arrangements for transmission which have been refined over the life of the NEM are broadly satisfactory and in the long term interest of consumers. Given the intricate relationship between all aspects of the current NEM design we believe there would need to be a material deficiency in the current regulatory frameworks, and a clear and highly probable net benefit in moving to a new arrangement before the Commission could prudently recommend any fundamental change. We believe a key consideration before any change is detailed analysis of the affect of the change to the stability and liquidity of the forward contracts/hedging market.

Snowy Hydro recommends that the Commission further develops its Appendix A analysis to clarify the following:

A. The first set of measures is produced by the AER. What the AER is seeking to do is measure the market cost of transmission constraints that prevent lower cost generation from being dispatched. The AER uses actual generator offers which may or may not reflect generators short run marginal cost. These measures may help signal where more transmission and/or generation investment may be desirable. In other words these measures attempt to measure the efficiency of transmission developments (and new generation and load investments) in response to emerging constraints. An important limitation of these AER produced measures is that they do not reflect the economic or the underlying resource costs of constraints.

B. The second measure was produced by Frontier Economics (Frontier) in order to better inform the Commission on the productive efficiency impacts (resource costs)

due to disorderly bidding. It is important to clearly differentiate the AER measures from the Frontier produced measure. The Frontier measure is the most appropriate measure to assess the economic costs or efficiency of the current congestion management arrangements, noting that this needs to be balanced against the economic impact of alternative congestion management arrangements (such as a generalised CSP/CSC) on the financial contacts markets.

The Frontier measure found that the economic (resource) cost of disorderly bidding is immaterial at $8 million per annum (for the 2006/07 financial year). The economic cost from disorderly bidding in the Spot market may possibly be reduced by an alternative congestion management regime incorporating the Constraint Support Price / Constraint Support Contract (CSP/CSC). Further, Snowy Hydro has shown in its Issues Paper Submission that the resource cost of disorderly bidding reduces with the introduction of material carbon pricing. However, there would be a much more material and adverse economic impact to the Contracts market that would far exceed any questionable efficiency gains from reducing disorderly bidding in the Spot market.

C. The third measure of congestion is the degree of 'mispricing' of generator settlement. Dr Darryl Biggar developed a methodology for calculating the extent of mispricing in the NEM. Mispricing is simply a proxy measure for the value of (implicit) transmission rights in the current NEM design. If the Commission determines that the extent of disorderly bidding is material enough for regulatory change, and the Commission believes reducing mispricing would reduce disorderly bidding, then any reallocation of transmission rights by making generators receive a proportion of their generation at their local price is simply a wealth transfer between participants. However this wealth transfer would also have substantial and negative net economic impacts on the Contracts market. **It is important to note that "mispricing" will still exist to a similar extent even in a Full Nodal market with Financial Transmission Rights (FTR) after the FTR is allocated or auctioned off and similarly under a generalised CSP/CSC arrangement.**

It is our observation that some Stakeholders are confusing what a Congestion Management Mechanism such as the Southern Generators generalised CSP/CSC can achieve. It seems these Stakeholders believe or have an expectation that a CSP/CSC regime will remove or "manage" congestion. This is an incorrect and misplaced understanding.

Congestion can only be managed by: efficiently building more transmission, new generation locating on the uncongested side of the network, load locating in the congested side of the network, and TNSPs planning and implementing planned transmission outages at times of relatively surplus supply and demand balance.

A generalised CSP/CSC is simply another means by which to allocate existing transmission capacity. Under the current NEM design this rationing is done by generators bidding to the floor price (this has been termed disorderly bidding). It is important to understand that the CSP/CSC may help reduce disorderly bidding but it will not reduce congestion.

Snowy Hydro strongly doubts whether the Southern Generator's generalised CSP/CSC would actually reduce disorderly bidding in practice. We are however very concerned that a CSP/CSC if implemented across the NEM would impose increased complexity and increased costs to **both** the Spot and Contract markets. These risks would far outweigh any questionable efficiency benefits from resolving mis-pricing or reducing disorderly bidding by making generators receive a more granular price.

Snowy Hydro is in a unique position having experienced operating under the Tumut CSP/CSC trial. Based on this experience to believe the CSP/CSC won't advance the

National Electricity Objective as it will have adverse impacts on: reducing productive efficiency, significantly increasing complexity in managing basis risk thereby adversely affecting the efficiency of the Contracts market, and have very complex implementation issues such as the allocation of the CSC. All these problems associated with the CSP/CSC are expanded at length in the body of this submission.

If the AEMC can objectively quantify that there is indeed a material congestion problem in the NEM that warrants regulatory action then the Commission should compare the current arrangements against a Full Nodal Market with auctioned Financial Transmission Rights. Such as approach would be better regulatory practice compared to the risk and complexity of a hybrid generalised CSP/CSC congestion management mechanism. We note however, that the international experience of Full Nodal Markets with Financial Transmission Rights is that these markets suffer from very illiquid and inefficient hedging/contracts markets.

The attached submission outlines Snowy Hydro's view in more detail and addresses the specific questions posed by the AEMC in the Congestion section of the Directions Paper. 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. Snowy Hydro looks forward to participating in the next stages of the review process.

Yours sincerely,

Roger Whitby
Executive Officer, Trading

Transmission Frameworks Review Directions Paper

Snowy Hydro's submission focuses on the issue of Congestion. We comment on four key areas identified in the Congestion section of the Directions Paper, including:

1. the materiality of congestion;
2. network availability;
3. generator behaviour; and
4. congestion management mechanisms.

Our particular focus will be on the dangers posed by the potential implementation of alternative congestion management mechanism such as the Constraint Support Contracts / Constraint Support Price (CSP/CSC).

1.0 Materiality of Congestion

Snowy Hydro believes congestion to date has been immaterial and transitory. There is no evidence to suggest that existing transmission regulatory frameworks would not satisfactorily deal with any future congestion.

We also highlight that a significant portion of congestion costs arise as a direct result of transmission outages. It would be inappropriate and indeed inefficient to modify the regulatory frameworks to deal with an operational and incentive driven issue.

From an economic perspective the most informative analytical study to date on the materiality of congestion has been the Frontier Economic study in 2007 which showed the resource cost of congestion was only $8m per annum. This is a very small amount relative to market turnover of $8 billion per annum.

In Snowy Hydro's submission to the Issues paper we did a stylistic study that showed that the economic cost of congestion was likely to decrease with the introduction of a carbon price.

The analysis showed the total economic cost of mis-pricing using current Short Run Marginal Cost (SRMC) 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 analysis confirmed 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.

2.0 Network Availability

Snowy Hydro strongly agrees with the Commission that it is important for economic efficiency that TNSPs operate their networks to ensure that capability is maximised especially at times of high market price sensitivity.

This is apparently clear when the case studies that AEMO had identified in their Issues Paper submission were all network outage related and in many cases multiple outages.

A more recent example has been SPI Ausnet's planned network outages of the critical Murray to Dederang lines. SPI Ausnet currently operates under an Availability Incentive

Scheme with AEMO. It is notable that AEMO as the electricity Market Operator has such a crude market value signal of transmission outage value to SP Ausnet. That is, the scheme is a very poor proxy to the market's desire for transmission outages to be taken out at times of minimal market impact. AEMO should re-examine these arrangements and their core drivers.

We note that SPI Ausnet is currently applying to be under the AER's Service Target Performance Incentive Scheme. We commend them for this initiative. However, it is clear that SPI Ausnet's current incentive scheme does not meet the needs of the market to minimise the market impacts of congestion as a result of planned transmission outages.

3.0 Generator Behaviour

Snowy Hydro agrees with the Commissions view that Generators bidding behaviour is driven by incentives created in the current NEM design.

We are concerned however that the some Stakeholders believe that this behaviour is inefficient and poses a threat to the security of the system without thoroughly examining the root cause of this behaviour. That is, the majority of this generator bidding behaviour is driven by network outages at times of tight supply/demand balance. Hence we believe a holistic assessment of generator behaviour must also consider the roles of AEMO as Market Operator and TNSPs as the originator of planned network outages.

4.0 Congestion Management Mechanisms

4.1 Disorderly Bidding

It is our observation that some Stakeholders are confusing what a Congestion Management Mechanism (CMM) can achieve. It seems these stakeholders believe or have an expectation that a CMM will remove congestion. This is an incorrect and misplaced understanding.

Congestion can only be alleviated by:

- Building more transmission;
- New generation locating on the uncongested side of the network;
- Load locating in the congested side of the network; and
- TNSPs planning and implementing planned transmission outages at times of relatively high supply and demand balance.

The key question then is what would a CMM achieve?

A CMM is simply another means by which to allocate existing transmission capacity. Under the current market design this is done through generators offering their capacity at -$1000/MWh (the floor price). As the AEMC points out in Appendix A of the Directions paper this results in:

> *Where all constrained generators price their offers at the price floor, dispatch is pro-rated amongst those generators, based on available capacity*[1]*.*

It is apparent that Stakeholders are concerned that when disorderly bidding occurs, generators bidding behaviour behind the constraint does not reflect their marginal cost. The Commission has termed this as "disorderly bidding". Snowy Hydro has concerns whether an alternative CMM would in fact reduce disorderly bidding. However given our experience with

[1] TFR Appendix A page 99

the Tumut CSP/CSC trial we are sure that a CMM would impose significant costs to the market by increasing complexity, increasing basis risk, and reducing the efficiency of the Contracts market. This will be explored later in this submission. What can be established now is that:

A Congestion Management Mechanism such as the CSP/CSC may help reduce disorderly bidding but it will not reduce congestion. This is a very important point as a CMM is not a panacea to resolve congestion.

An affect of disorderly bidding is that generators' local price (shadow price) behind the constraint prices diverges from the price on the uncongested part of the transmission system (usually the Regional Reference Node (RRN)). This has been termed mispricing.

4.2 Mispricing and the Management of Basis Risk

Mispricing is the difference between a generators settled price (RRN) and its local nodal price. Mispricing in the NEM has been made out to be inefficient. Snowy Hydro strongly disagrees with this articulation. In the NEM regional market design mispricing is an acknowledged trade-off between the granularity of location pricing signals and the efficient functioning of the Contracts Market.

To remove mispricing through the introduction of a congestion pricing mechanism such as the CSP/CSC would involve a fundamental change to the NEM market design. It would introduce basis risk for generators selling financial contracts in its own region.

However, the trade-off for removing mispricing in the Spot market would be much greater inefficiencies in the Contracts Market. Snowy Hydro strongly argues that a deep and liquid Contracts Market has been facilitated by the current NEM design.

To move in this direction would require transmission property rights to the RRN to be relocated. Under the CSP/CSC proposal this would involve the complex issue of allocating constraint CSCs in real time. Our experience with the Tumut CSP/CSC trial shows that the uncertainty a generator faces on their allocation of the CSCs to access their RRN would significantly reduce the generators ability to sell forward contracts.

If the AEMC can objectively quantify that there is indeed a material congestion problem in the NEM that warrants regulatory action then the Commission should compare a Full Nodal Market with auctioned Financial Transmission Rights to the current NEM design. Such as approach would be better regulatory practice compared to the risk and complexity of a hybrid CSP/CSC congestion management mechanism.

4.3 Comparing the potential affect of disorderly bidding under the current market design to an alternative Congestion Management Mechanism such as the CSP/CSC

On page 50 and 51 of the Directions Paper the Commission outlines the affects on disorderly bidding in the current market design:

> *The presence of disorderly bidding will mean that generators' offer prices do not reflect their underlying resource costs of production. This undermines the economic efficiency properties of the bid-based merit-order dispatch approach used in the NEM, and leads to less certain dispatch outcomes. Generators have less confidence about how every other generator may behave and therefore what the resulting dispatch outcomes will be.*
>
> *If network capacity is rationed using non-cost-reflective prices, there will be a risk that efficient generators are not able to access the market as they have no mechanism to*

signal the value they place on this access. As discussed in Chapter 4, reduced certainty of dispatch outcomes will impact financial markets, increasing costs and potentially discouraging investment in new generation plant.

Disorderly bidding may also impact the certainty of inter-regional trade.

It would appear that the Commission are considering whether the benefits of an alternative CMM such as the CSP/CSC would outweigh the costs imposed to the market when disorderly bidding occurs.

In this section we will compare the cost and benefit of the current NEM design with reference to the AEMC comments on page 50 and 51 versus the potential cost and benefit from a CSP/CSC across the NEM.

Market Design Feature	Advantage	Disadvantage	How material?	Will a CSP/CSC CMM help?
Disorderly bidding	Relatively simply risk management approach to dealing with constraints			No – CSC allocation is unknown ahead of dispatch. This increases uncertainty.
		Generators' offer prices do not reflect their underlying resource costs	Frontier Economics has shown this to be immaterial at $8m pa relative to market turnover of $8 billion pa.	Not likely – Because CSC allocation is unknown ahead of dispatch, generator offers are likely to bid conservatively and not at their SRMC.
		Efficient generators are not able to access the market as they have no mechanism to signal the value they place on this access	Immaterial as demonstrated in Frontier Economics modelling.	No – It's unclear whether Generators behind the constraint are likely to offer prices at their SRMC due to increase uncertainty and complexity of the CSC allocation being dependent on the type of binding constraint and interconnector flows
		May impact the certainty of inter-regional trade	Immaterial - Anecdotal evidence suggests inter-regional trades occur at the margin with most contracting done intra-regionally	No – The CSP will create major basis risk for intra-regional generators. This would lead to a much greater reduction in intra-regional contracts compared to a potentially small increase in inter-regional contract trade. The net result would be a reduction in overall forward Contract trade.

Table 1

From an examination of Table 1 it is clear that the potential implementation of a CSP/CSC Congestion Management Mechanism will not address the criticisms against disorderly bidding.

4.4 Adverse Issues associated with a CSP/CSC Congestion Management Mechanism across the NEM

There are potentially adverse impacts and complex implementation issues associated with implementing an alternative congestion management mechanism such as the CSP/CSC. We outline below some of theses issues below.

4.4.1 Reduction in productive 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.

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**.*

4.4.2 Significant increased complexity in managing basis risk

The introduction of a CSP/CSC constraint management mechanism would significantly increase the complexity of managing basis risk as it increases the number of potential prices in the market. Generators subject to a CSP/CSC therefore have to manage the risk of price separation between its local nodal price and its RRN.

There are thousands of constraint equations in the NEM dispatch engine. The type of constraints include: thermal, voltage, and stability constraints. For each generator the type of constraint that is likely to bind is heavily dependent its location. These factors include for instance whether the generator in a heavily meshed network, the voltage levels, the level of capacitive support, and the generators location relative to an inter-regional interconnector. All these factors determine which type of constraints is more likely to bind.

A generators allocation to the CSC (access to its RRN) would be dependent on the coefficient of the relevant binding constraint. However, depending on which type of constraint is binding these constraint coefficients can substantially vary from one type of constraint to another. Further to this if the binding constraint has an interconnector term, a generators CSC allocation would also be dependent on the interconnectors flow. Hence a generator would find it very difficult to manage its basis risk on a dispatch basis. This increased basis risk would ultimately limit future contract competition and increase the overall costs to customers.

We believe this could also adversely impact a generator who has entered into a long term contract prior to a CSP/CSC mechanism being implemented. This raises sovereign and regulatory risks of such an arrangement and reinforces the risk in long term contracting.

Further, major constraints in the NEM are integrally linked to each other. This fact reflects the intermeshed nature of electrical transmission networks. This linkage of constraint equations means that it would be impractical to implement a localised CSP/CSC

[2] AEMC Snowy Region Abolition of Snowy region, Rule Determination, 30 August 2007, page 18.

arrangement for only one location. Hence, effectively to apply a localised CSP/CSC would require a full blown CSP/CSC arrangement across the entire NEM.

Such as outcome would significantly magnify the complexity of managing basis risk in the NEM and inevitably lead to less contract market competition and lower market efficiency. We note that such as policy approach would in practice be no different to full nodal pricing which has been rejected by the MCE.

The efficient functioning of the Contracts Market must be a major consideration given that approximately 90% of a generators annual production are sold forward in the Contract market. Snowy Hydro strongly believes that the CSP/CSC would adversely impact the liquidity and transparency to the Contracts 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).*
>
> *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.*

4.4.3 Very complex implementation issues

For a CSP/CSC constraint management mechanisms to be more generally applied in the NEM would require resolution of a number of complex implementation issues.

- As highlighted above the identification of which constraints would be applied in the mechanism would be very complex given that analysis of the prevailing patterns of congestion in the NEM shows that much congestion has been transitory and that a large proportion coincides with network outages. If all constraints were included in the local mechanism this would greatly exacerbate the challenge of managing basis risk. However, if too few constraints are included then the mechanism may be ineffective as it may not be active when required.

- The allocation of the CSC would be very contentious. The form and duration of the CSC allocation would impact on the ability of market participants to manage basis risk and their ability to forward contract.

  An administrative form of allocation (ie. based on available capacity) increases incentives for inefficient behaviour. For example, incumbent generators would be incentivised to overstate their available capacity, which might adversely compromise AEMO's ability to operate the system securely. There would be perverse incentives on generation plant to locate in a constrained area of the network safe in the knowledge that it would secure financial rights to the RRN based on its available capacity. This is illustrated in the example in Figure 1 below. This example clearly highlights that the Southern Generator's generalised CSP/CSC is unworkable and will create perverse and inefficient location incentives for new generators.

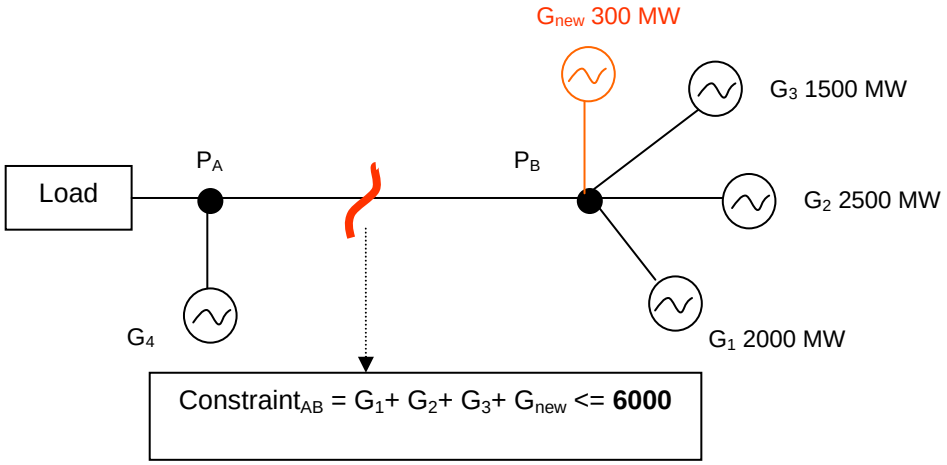
A market-based approach to allocating financial rights is arguably more appropriate for CSP/CSC compared to an administered form. However a market based approach would involve significant additional complexity for market participants. As stated earlier there are thousands of constraint equations with a different level of impact on the generator. These impacts are also materially different depending on the type of constraint. Hence, individual auctions for financial rights in each constraint would be required to cover the differences across all constraints. Therefore this would require very significant number of auctions. This would not only require significant Implementation cost to establish the auction platform to purchase these financial rights and also increase the cost for all Market Participants to develop necessary tools to participate in such auctions.

Figure 1 – Example of inefficient location of new generation under CSP/CSC regime

The combined capacity of incumbent Generators $G_1 + G_2 + G_3$ is 6000MW.
The constraint limit from Pricing nodes P_A and P_B is 6000MW

Under the CSP/CSC G_{new} would be guaranteed access with a CSC allocation of 285MW ie. 6000MW (constraint limit) * (300 MW) / (6000 + 300 MW).
This represents 95% of G_{new} capacity.

Under the current market arrangements G_{new} has **sufficient** locational signals to not locate in this already congested location. However, with a CSC allocation of 95% of its capacity, G_{new} would perversely be incentivised to locate in this congested region.



Snowy Hydro see risks to **both** the Spot market and Contract market from the potential implementation of a congestion pricing mechanism such as the CSP/CSC. These risks would far outweigh any questionable efficiency benefits from receiving a more granular price.

Our overall position in relation to the CSP/CSC 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.