8 November 2019

Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

Submitted by email to aemc@aemc.gov.au

Project number: EPR0073

**Coordination of Generation and Transmission Infrastructure proposed access model Discussion paper**

Snowy Hydro Limited welcomes the opportunity to comment on matters raised in the Discussion paper from the Australian Energy Market Commission (the Commission) on the Coordination of Generation and Transmission Infrastructure proposed access model.

Snowy Hydro Limited is a producer, supplier, trader and retailer of energy in the National Electricity Market (NEM) and a leading provider of risk management financial hedge contracts. We are an integrated energy company with more than 5,500 megawatts (MW) of generating capacity. We are one of Australia's largest renewable generators, the third largest generator by capacity and the fourth largest retailer in the NEM through our award-winning retail energy companies - Red Energy and Lumo Energy.

The NEM is currently undergoing significant change, so it is timely that the Commission undertakes this review to see where improvements can be made that benefit consumers. We believe that the proposed reforms are well intended, however we question the extent to which the theoretical benefits would translate to reality, particularly in view of the impact on contract markets and disincentive to invest that would be created. The proposed reforms involve very complex changes to the spot market settlement process, which introduce new risks and uncertainty to scheduled generators. Risk is a key consideration in deciding what volume of contracts a generator is willing to supply, consequently there is the potential for this to reduce the quantity of contracts made available in each region, a detrimental outcome for contract market liquidity and market customers who rely on these contracts for certainty of retail pricing.

Given the sophistication of the proposed changes and the fact that the Commission is still developing the proposed design, it is vital that adequate modelling is undertaken with input from market participants prior to deciding to proceed. It is important that there is a sufficient lead time between that decision point and any possible implementation date so contract market disruption is minimised. The modelling should also acknowledge feedback from potential investors in new plant in the NEM. This group of participants is critical to the future NEM supply/demand balance and system security. Doing this will also give time for the Integrated System Plan (ISP) to be actioned, allowing its positive impact on the issues to be taken into account, and also allow for more detail to be worked through on the ESB post 2025 market design.

A large part of the reform is aimed at addressing outcomes that occur very infrequently (for example "race to the floor bidding") and have minimal impact on the overall cost of electricity to consumers. Brief periods of perceived inefficient spot market dispatch need to be weighed up against the longer term benefits of firm access to the regional reference price and a simple and transparent route for investors to recover their cost of capital.

Some of the current contract market volume will gravitate towards each generator's Locational Marginal Pricing (LMP), as they seek to diversify their exposure between the LMP and Regional Reference Price (RRP). By operating in the Snowy node in the past, we have seen this in practice and been subject to receiving a local price with non-firm transmission hedges. Our experience was that locating volume on the Snowy node, rather than the central Regional Reference Node (RRN), lowered contract market liquidity while increasing costs and creating inefficiencies.

Snowy Hydro supports the Commission's decision to not have transmission hedges drive transmission planning and investment. Transmission hedges are unlikely to lead to more "correctly" located investments in generation and network than the current system, as factors such as availability of resources (fuel and land) and political guidelines for renewable energy and availability of fuel often place new generation away from demand centres. Most critically, the future shape of the NEM will need to accommodate dispersed renewable generation at large scale. It is not feasible to reshape the current NEM to cater for this environment simply by overlaying a new set of transmission rights. Long term transmission planning is already being undertaken by the ISP process which represents the collective input of all interested stakeholders, and is already influencing participant's long-term investment decisions. It is therefore vital that transmission planning and investment be conducted through the current regulated process, including the ISP. If the ISP were to be delayed through the proposed reform it would delay the timelines of connection for renewable projects and risk escalating security and cost risks for consumers. Consumers will then face the subsequent reality of relying on long lead-time projects to restore confidence in the electricity supply industry.

Centrally coordinated investment in transmission and interconnection will ensure system security and reliability, and will underpin investment in new renewable generation and increase competition in the market to put downward pressure on prices to benefit consumers. Further to this it would resolve the Commission's concerns with congestion and volatile Marginal Loss Factors (MLF).

The proposed transmission access reform will not solve the range of issues noted by the Commission in the Discussion paper. Snowy Hydro's detailed concerns are as follows:

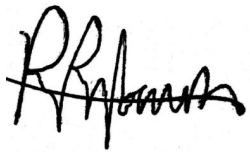
- Over-regulating the market through transmission access reform will hamper its capability to deliver economically efficient outcomes and therefore end up costing consumers more in the long run.
- Transmission system congestion is designed to be a signal for transmission companies that more investment is required. Generators are already subject to volume risk and have strong incentives to avoid long term congested areas of the network.
- Dynamic loss factors will increase risk for generators as generators will be unable to know in advance what contract volume they are able to sell and therefore what revenues they can earn. This will add further complexity to the proposed reform.
- If generators are bidding at low prices and filling congested transmission lines, that means they are supplying as much as they can. This should result in lower prices, not increase them.
- The contract market is particularly complex and the transmission access reform will lead to significant changes and complexities. When confronted with increased transaction costs, which will occur through changes imposed from transmission access reform, participants trade less often.
- The complexity and uncertainties introduced will actually lead to a stifling of generation investment.
- The tenor of the transmission rights will likely add more risk to generators. Short timeframes will not allow generators to manage their risk associated with the potential life of asset while for smaller participants it will lead to additional complexity, who will be forced, in effect, to

procure a new type of hedging instrument and to participate in a new auction process. This will increase costs and create new barriers to entry which will impact consumers as there will be less competition.

- The system operator would have a permanent role in collecting and redistributing congestion rents from system users to rights holders under congestion contracts, leading to a bureaucratic expansion in the role of the system operator. This will, again, increase costs and create new barriers to entry.
- The implementation dates proposed for access reform are unreasonably ambitious. If there is a need to review elements of the access reform then it should be considered as part of the Energy Security Board (ESB) Post 2025 Market Design work.
- Significant reform assessment should be undertaken in a considered and evidence based manner which complements the transformation of the energy sector. This process must consider trends in the NEM and necessary future generation investment. The connection of large scale renewable energy zones (REZ)s to nationally significant and strategic transmission projects is supported.

Snowy Hydro appreciates the opportunity to respond to the Discussion paper and any questions about this submission should be addressed to me by e-mail to panos.priftakis@snowyhydro.com.au.

Yours sincerely,



Panos Priftakis
Head of Wholesale Regulation
Snowy Hydro

# Overview of proposed model

The existing market design and contracting arrangements in the NEM remain effective and will continue to deliver new investment without compromising reliability, if left to operate without disruption. The transmission access reform would have a severe impact on the contracts market and the NEM as a whole by introducing additional layers of risk and uncertainty that need to be factored in to contract volumes and prices. There will be a lack of history of each generator's local price, and new regional nodal price, as well as no experience or history of the transmission rights auction prices or payouts. This will create multiple risks for generators, reducing liquidity in the secondary market and ultimately worsening consumer outcomes compared to the status quo, as prudent risk management usually takes into account what can happen at the extremes, in this case receiving a low local price whilst transmission rights payouts are inadequate due to either insufficient holdings or network outages.

The Commission is proposing to *"enable scheduled market participants exposed to their local price to better manage the existing risks of congestion and transmission losses by enabling them to purchase financial transmission rights."*[1] Snowy Hydro however believes that over regulating the market will hamper its capability to deliver economically efficient outcomes and therefore end up costing consumers more in the long run. Transmission system congestion is designed to be a signal for transmission companies that more investment is required and if transmission companies are not appropriately aligning their investment with market signals further study should go towards what is preventing this.

Further to this, the Commission notes that *"race to the floor bidding means that the lowest cost available generator is not always dispatched, which can increase the wholesale cost of electricity over the longer term for consumers".* [2]Snowy Hydro notes in regards to this that if all generators affected by "congestion"[3] (ie. a binding constraint) were bidding to the price floor, they would then be bidding volume at the same price which would result in National Electricity Market Dispatch Engine (NEMDE) constrained linear solver determining the optimal lowest cost solution. The transmission access reform proposals contradicts the premise of the lowest cost available generator always being dispatched in the following ways:

- It is up to individual corporations to make offers that align with their commercial operations
- If certain generators are being dispatched more than others in a congested system then either:
    - it is not an economic outcome for the generator to be dispatched more, or
    - the corporation has not made a commercially optimal offer
- In either case further regulation will not lead to a better outcome because:
    - free markets are more efficient at delivering economic outcomes than over regulated markets
    - if a corporation has not made a commercially optimal offer, the loss of revenue or loss from contracts will incentivise them to make an improved offer in the future. Changing market rules will only further impede this process.

[1] AEMC, Coordination of Generation and Transmission Infrastructure proposed access model, Discussion paper, 14 October 2019 , pp V.
[2] ibid, pp iii
[3] ibid, pp 8.

Snowy Hydro is concerned by the Commission's conclusion that the lowest cost generator not being dispatched will lead to an increase in wholesale cost of electricity. If generators are bidding at low prices for brief periods where congestion exists then those generators are competing to supply the maximum amount of energy taking into account more than simply their Short-Run Marginal Cost (SRMC), such as sold forward contracts, fuel and plant constraints, which is an efficient outcome. The counterfactual of uncongested lines with generators not competing to maximise supply would lead to higher prices.

## Impact on generation investment

The complexity and uncertainties introduced will actually lead to a stifling of generation investment and we encourage the Commission to seek feedback from the full range of generation developers in the process. Generators may delay investments in order to understand how the proposed framework works so as to observe if there are aspects of the reform that do not work as expected. This would all come at a time when there is significant amounts of investment required in the NEM. In addition, it would represent an additional barrier to Snowy Hydro signing up to further long term renewable offtake agreements if these reforms were implemented, compared to the current market design.

## Transmission planning

Australia's energy system is undergoing a rapid and profound transformation with a critical need to progress transmission upgrades to ensure the timely integration of renewables and large scale storage into the grid. The Commission has correctly noted that *"the Australian Energy Market Operator's (AEMO's) Integrated System Plan (ISP) in the 'neutral with storage' modelling scenario shows that by 2030 over 6,000 MW of existing generation is expected to close and be replaced by approximately 22,000 MW of renewable generation and 6,000 MW of storage. By 2040, the amount of expected closure increases to approximately 16,000 MW, which is projected to be replaced by 50,000 MW of renewable generation and 20,000 MW of storage"*[4] which clearly highlights that the NEM is clearly past the tipping point of firmed renewables being the most economic form of new generation and transmission investment is needed.

The ISP considers the immediate and growing need for connection of storage for greater than 15 GW of utility scale storage between now and 2040 as noted by AEMO in the ISP Insights paper. Snowy Hydro therefore believe that the ISP should be actioned, allowing its positive impact on the issues to be taken into account.

We continually advocate that strategic, and low regrets projects such as HumeLink and KerangLink are implemented in a timely manner, to support the resilience of the NEM. This would increase overall system resilience and insure against the risk of early exit of coal-fired generation in Victoria and New South Wales. To do otherwise results in escalating security and cost risks for consumers, who will face the subsequent reality of relying on long lead-time projects to restore confidence in the electricity supply industry. Compare this to a significant transmission access reform which could take a long lead time to prepare and would disrupt the contract market.

Investment in transmission and interconnection will ensure system security and reliability, and will underpin investment in new renewable generation and increase competition in the market to put downward pressure on prices to benefit consumers. Further to this, it would resolve the Commission's problems with congestion and MLF.

[4] ibid, pp ii

# Dynamic Regional Pricing

## Dynamic loss factors

The Commission notes that under dynamic regional pricing that intra-regional and interregional losses would be dynamically calculated in dispatch. Snowy Hydro believe this will add another layer of risk further affecting generators ability to offer forward contracts. While financial transmission rights (FTR)s may cover this risk, this is on the assumption that the generator holds sufficient units and the network physical capacity is also adequate at the time. The Commission correctly recognises *"that moving to dynamic loss factors could potentially increase volatility of loss factors"*[5] highlighting that *"generators today are expressing concerns with the increased volatility in their annual marginal loss factors from year to year."*[6] The Discussion paper notes that adding a product will allow generators to hedge against changes in loss factors however all it indicates is another additional complexity with the proposed transmission access reform which is not needed.

## Dynamic Regional Pricing and Financial Transmission Rights

The Commission noted that, "*If all load were to face a locational marginal price instead of a common regional price, there may be a risk of splitting liquidity in the contract market, as forward contracts would potentially instead need to be struck against different locational marginal prices*[7]*". To rectify this concern the Commission* propose that retailers and other non-scheduled market participants would continue to be settled at a common regional price for wholesale electricity, in order to support liquidity in the forward contract market. Further to this, the Commission notes that the design of FTRs is consistent with this proposal, and should go further to improve the liquidity of forward contract markets.

While we agree pricing loads at common regional price will help maintain liquidity compared to to pricing load at each local price, an effective primary market is dependent on a liquid, efficient secondary market, and this in turn depends on minimising basis risk for market participants. Snowy Hydro is concerned by the Commission's conclusions on liquidity and believe the changes through scheduled market participants facing a locational marginal price for wholesale electricity and the forming of financial transmission rights will disrupt the contract market. We believe the volume of contracts offered at the regional node will be lower than under the status quo as generators will not have sufficient certainty that transmission rights (that are non-firm) will cover differences in local prices and regional prices when the network is below its assumed capability. It is also our understanding that the volume of rights auctioned will be below the normal network capacity, thereby lowering the volume of contracts available to the node from each local node. This will lead to either less contracts being offered, or some contract volume being offered at the local node price fracturing liquidity. We have historical evidence that this is a likely outcome, as Snowy Hydro was subject to local node pricing until the Snowy node was abolished in 2007. When the Snowy node was in place, a percentage of our contracts were referenced to that local node due to the risk we faced between generation plus Settlements Residue (FTR) revenue and payouts under Victorian and NSW contracts.

[5] ibid, pp 41.
[6] ibid, pp 41.
[7] ibid, pp 51.

Since the abolition of the Snowy node, Snowy Hydro have been able to offer additional contracting volume against the Victorian and NSW reference prices, providing market participants with hedging products aligned to their own retail exposure. We are willing to discuss this in more detail with the Commision. Generators may respond to this increased basis risk by contracting only at their generation node which will transfer the basis risk to counterparties who may not be best placed to manage this risk. This is in complete contrast current NEM market design has delivered liquid financial contracting markets and facilitated the entry of small retailers and generators leading to increased the level of competition to consumers for the supply of electricity.

The change will also create significant uncertainty for on-foot electricity derivatives. Under the 'ISDA Commodity Definitions', which are incorporated into ISDA-based over-the-counter electricity contracts, changing the formulation of the Spot Price will likely trigger a Market Disruption Event, which will in turn require parties to renegotiate contract terms. If the parties cannot agree to new terms, electricity derivatives typically require that the matter be resolved through arbitration. This will impose additional costs, and the resulting uncertainty will also deter parties from transacting, reducing liquidity.

When confronted with additional transaction costs, which will occur through changes imposed from transmission access reform, people trade less often. Transaction costs in an economic system are therefore like friction in a mechanical system. The Commission needs to make sure it does not assess the contract market in simple terms. In short, in assessing the risks and benefits of any reforms, the Commission must give at least equal weight to their impacts on the secondary market. The very high level of hedging adopted by most participants means they are, by and large, economically indifferent to spot market outcomes - some of these being the brief "race to the floor" events. Reforms which ignore the impacts on contracts miss the 'main game', that is, where the most important decisions affecting energy markets take place.

The focus should be on the impact of its decisions on the efficiency of the overall commercial framework for the electricity sector, including the nature of spot and interregional basis risk and the ease of hedging those risks. Doing so will require some discretion and judgement in considering the trade-offs when assessing such a significant reform on industry.

# Financial Transmission Rights

The Commission's proposal to enable scheduled and semi-scheduled market participants to purchase FTRs is a very intrusive design. The current Settlements Residue Auction (SRA), with just 6 links auctioned currently involves significant internal time and resource. Moving to the proposed FTR system with potentially hundreds or thousands of links would increase the resource need materially. We are also concerned that these transmission rights would not be firm, but rather subject to the actual network availability, thereby reducing their usefulness in firming local generation to the node.

Snowy Hydro continues to raise concerns that transmission hedges may lead to market power issues in some segments of the grid if generators are able to buy the rights from another generator's local node to the regional node.

The Commission proposes that *"quarterly products would be available up to three to four years in advance. For example, participants could purchase a right for the immediately upcoming three-month period, or for a three-month period three or four years in the future."*[8] The length of the

[8] AEMC, Coordination of Generation and Transmission Infrastructure proposed access model, Discussion paper, pp 70

transmission rights will likely add more risk to generators. Short timeframes will not allow generators to manage their risk associated with the potential life of asset while for smaller participants it will lead to additional complexity, as they will be forced, in effect, to procure a new type of hedging instrument and to participate in a new auction process. This will increase costs and create new barriers to entry, ultimately to the detriment of consumers.

The Commission notes that *"physical market participants should be able to purchase financial transmission rights in the auction run by AEMO with the payout on the difference between local prices and regional prices."*[9] This alone would require each stage of power flows analysis to be undertaken to evaluate the simultaneous feasibility of power flows and hence the revenue adequacy of the transmission hedge. Furthermore, the system operator would have a permanent role in collecting and redistributing congestion rents from system users to rights' holders under congestion contracts. Snowy Hydro is concerned this approach would lead to an enormous bureaucratic expansion in the role of the Australian Energy Market Operator (AEMO). It will also add additional complexity to market participants, who will be forced, in effect, to procure a new type of hedging instrument and to participate in a new auction process. This will, again, be to the detriment of consumers as costs increase and create new barriers to entry.

The Discussion paper notes that FTR auction outcomes could reveal the level of demand from generation for access to a particular part of the transmission network, noting that this information may be useful to inform the development of future strategic and project plans such as the ISP and TNSP's Annual Planning Reports. Snowy Hydro believes it is difficult to prove that FTR actually lead to more "correctly" located investments in generation and network than the current system as factors such as availability of resources (fuel and land) and political guidelines for renewable energy and availability of fuel often place new generation away from demand centers. It is therefore vital that the transmission rights do not appear on the ISP, as they would delay the plan which already has a significant task in taking stakeholder feedback and undertaking a plan for the NEM.

# Quantitative Analysis

The NEM is currently undergoing unprecedented levels of change with a rapid transition to renewables as the thermal coal generation fleet is quickly ageing and many of these assets reaching end of life. To address these challenges there are major changes that are awaiting implementation or are under consideration, and how they will interact with any change to the market design through the ESB's post 2025 market design. These include:

- Retailer Reliability Obligation;
- Five-minute pricing and settlement; and;
- Wholesale Demand Response;

Market participants are currently responding to potential wide-ranging reforms to the security and reliability frameworks in the NEM. With the myriad of costly changes our industry faces in the coming years the clear solution from this dilemma is that work on access in the status-quo design be merged into the post-2025 market design review. We strongly oppose the proposed implementation date of July 2022. It is more appropriate to implement dynamic regional pricing and FTRs rather the review of this reform should be merged into the post 2025 market design.

Further to this, significant reform assessment should be undertaken in a considered and evidence-based manner which complements the transformation of the energy sector. Snowy Hydro

[9] ibid, pp 70

strongly support a proper cost benefit analysis, in this case the quantitative modelling, on the impact of dynamic regional pricing and firm access arrangements being undertaken. This would properly consider the costly operational impact the reforms will have on market participants and the risks for consumers.

The Commission notes that *"for larger tasks that require more detailed modelling, we propose to commence this modelling at the end of 2019. These exercises will aim to be completed by early to mid 2020"*[10] which indicates further that the turnaround of implementation 2022 is too short and that a proper quantitative assessment needs to be undertaken before the Commission progresses to any next stages.

# Renewable Energy Zones

Snowy Hydro supports the connection of large scale REZs to nationally significant and strategic transmission projects. The existing lines were built around aggregated coal plant capacity, but these are being superseded by new REZs that will be left stranded if timely transmission upgrades do not occur. Transmission is currently the single most important issue in the NEM.

New transmission is critical to ensure energy security in the future and will bring new generation and competition into the market, which puts downward pressure on prices for consumers. Snowy Hydro believes the ISP considers the development of REZs in the future that are optimised with necessary transmission developments while also identifying indicative timing and staging that will best coordinate REZ developments with identified transmission developments to reduce overall costs. The NER currently being developed by the ESB to action future ISPs should therefore address this issue for REZs that are identified in the ISP.

# International experiences

With the proposed reform the Commission should assess the recent report from economic consultants Castalia Strategic Advisors which provides useful insights into the current review process [11]. Snowy Hydro notes key take outs from the paper which include:

- The New Zealand market actually shows the limitation of nodal pricing and FTRs to address investment coordination. There are two key reasons for this which include persistence of poor coordination in New Zealand market despite locational marginal pricing (LMP), and the introduction of FTRs hasn't improved coordination.
- The ongoing reform work to better coordinate generation and transmission investment in the New Zealand market is being undertaken, despite the existence of nodal model the Commission is proposing to introduce to the Australian market
- Policy reviews undertaken in the UK in recent years, seeking to address the need for better investment coordination through transmission access reform, and integrated transmission planning and regulation have not recommend locational pricing and FTRs to achieve better coordination. Nor has the UK market (or, to the best of our knowledge, any market) made transmission expansion fully dependent on revenue from transmission hedges.[12]

[10] idib pp. 81

[11] Castalia Strategic Advisors, 2019, "Supplementary Submission on AEMC's Proposed Transmission Access Reforms Report to Origin Energy"

[12] ibid