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Energy Security Board  
Level 26, 1 Bligh St  
Sydney NSW 2000

Submitted by email to [info@esb.org.au](mailto:info@esb.org.au)

### **Post 2025 Market Design Issues Paper**

Snowy Hydro Limited welcomes the opportunity to comment on matters raised in the Issues Paper from the Energy Security Board (ESB) on the Post 2025 Market Design.

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.

Snowy Hydro understands that the NEM is undergoing fundamental changes and welcomes the post 2025 project with the objective of satisfying the existing National Electricity Objective (NEO). The market design assessment should be undertaken in a considered and evidence based manner which complements the transformation of the energy sector.

The ESB should not abandon the foundations of the existing market structure in the process, which has been largely successful in achieving the National Electricity Objective (NEO). The NEM is an energy-only market which has served us well for many years. Under this structure, peaking generators such as Snowy Hydro, and others, regularly invest large amounts of capital to ensure they are available during times of scarcity. They do everything possible, at their own cost and own risk, to ensure they are ready to generate during the relatively few periods when demand cannot be met by other types of market generation.

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 intervention. The success of the NEM rests with decentralised decision making, liquid and deep contract markets and stable regulatory frameworks. System security and reliability remains a critical aspect of effective energy delivery which should be achieved through minimal market intervention. Where possible competitive markets should be used or developed to deliver the required energy and ancillary services with all forms of interventions should remain a last resort and should not distort the market.

Snowy Hydro's views on the post 2025 market design issues paper that are most critical to achieving a successful long-term NEM are as follows:

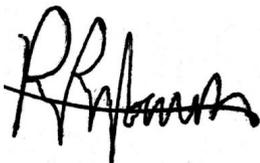
- Support competitively neutral approaches that do not advantage one technology over another and a transparent approach that aids the price discovery process.
- Support market-based solutions allowing market participants to respond to price signals in the spot market, resulting in the best and most economical solutions for all parties.
- The impact of any new market needs to be considered carefully to avoid any unintended consequences, taking into account risks around costs and benefits.

- The myriad of proposed and recently implemented changes to the wholesale market design is sending conflicting market signals which will reduce market efficiency and increase costs to consumers. Regulatory uncertainty is hindering investment and disrupting the contract market.
- Policy design provides a pathway towards increasing efficiency in the NEM but requires a coordinated and deliberate analysis and design. There needs to be singular point of judgement that should promote congruence between reforms without increasing complexity of the policy landscape and the number of reforms being considered.
- Intervention is compromising the current market design and its pricing signals affecting wholesale electricity prices and market signals to investors, and the energy and compensation costs faced by consumers. The NEM design gives equal opportunity/incentives on both the supply side (generators) and the demand side. Increased intervention further distorts spot price signals.
- The ESB should promote transparency as well as predictability, so that market participants can make efficient investment and operational decisions.
- The NEM's history of new entry in response to price spikes is indicative of a market that is free of significant barriers to entry. There are currently many new entrants in the market.
- The growth in variable renewable energy requires investment in firm generation. Snowy 2.0 will not dissuade investment in firm capacity rather it is a need required to complement the variable renewable energy investment boom.
- Transmission is currently the single most important issue in the NEM and beyond. Failure to commit to appropriate infrastructure now will hinder the transition which places greater importance on the connection of strategic projects.
- 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.
- The Integrated System Plan (ISP) should be the base of any future market design and should be incorporated in the assessment of future market design.
- Care must be taken by the ESB in making comparisons to the rest of the world or to non-NEM states which are very different markets. However, the NEM can learn from the European and US markets on the impact of the growth in intermittent technologies into the market and the issues facing these regions.

The NEM is going through transition and it is vital that risks are allocated to those best able to manage them. Where the decision-making powers of energy market bodies are enhanced, strong and clear accountability must be maintained.

Snowy Hydro look forward to participating in the post 2025 market design process with the ESB and appreciates the opportunity to respond to the Issues Paper and any questions about this submission should be addressed to me by e-mail to [panos.priftakis@snowyhydro.com.au](mailto:panos.priftakis@snowyhydro.com.au).

Yours sincerely,



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# The National Electricity Market (NEM)

The Australian energy market is unique in both its function and purpose and is the result of ongoing National Competition Policy reforms applied across the Australian economy since the early 1990s. Over the past two decades successive federal and state governments have pursued an extensive reform program that dramatically changed the electricity supply model. This reform program included: physical interconnection, structural separation, corporatisation, privatisation, creation of formal physical and financial markets and regulatory frameworks.

The design features of the NEM's energy-only market are well-understood. It is a mandatory gross wholesale pool into which generators sell all of their electricity. Bids are dispatched by AEMO on an economic merit basis (subject to reliability and security constraints), with the price set by the marginal generator. This imposes powerful competitive discipline on generators to bid at, or even below, short-run marginal cost (SRMC) as they must compete with each other through the interconnected system by submitting bids for every five minute dispatch interval. The Long-run Marginal Cost (LRMC) is a signal to invest and not intervene in the market.

Snowy Hydro believes that in considering any enhancements to the market design, the ESB should give priority to the primary market signals of Unserved Energy (USE), Maximum Price Cap (MPC), Minimum Floor Price (MFP), and Cumulative Price Threshold (CPT) as a means to signal the need for new investments to maintain reliability and security. The post 2025 market design should be built on the strengths of the existing wholesale market design which for two decades has been a success based on decentralised decision making. The existing market design can be relied upon to support reliability in the long-term with the NEM.

The NEM was designed to operate in a competitive national market with volatility being another electricity market feature since the deregulation. Volatility is especially important in energy-only markets, as it is the only opportunity peaking power stations have to recover fixed costs and sustain investment and maintenance.

Table 1 below shows the relative contributions of baseload and peaking generation to wholesale price outcomes. It shows that the contribution of peaking generation (volatility) to spot prices are generally minor. In NSW for 2018, volatility contributed \$1, or 2 percent of average prices. Even in Victoria, severely depleted by the retirement of Hazelwood, the contribution of volatility was 12 percent.

**Table 1: Wholesale Spot prices by underlying (limited to \$300/MWh) and volatility (>\$300/MWh) components, 2008 to 2014 average, 2016, 2017 and 2018 (to June 2018)<sup>1</sup>**

		2008 to 2014	2016	2017	2018 (to June)
\$/MWh and proportion of price by component					
Queensland	Underlying	\$37 (86%)	\$61 (90%)	\$85 (83%)	\$68 (98%)
	Volatility	\$6 (14%)	\$7 (10%)	\$17 (17%)	\$1 (2%)
NSW	Underlying	\$37 (90%)	\$58 (98%)	\$90 (95%)	\$76 (98%)
	Volatility	\$4 (10%)	\$1 (2%)	\$5 (5%)	\$1 (2%)
Victoria	Underlying	\$36 (91%)	\$46 (97%)	\$92 (100%)	\$82 (88%)
	Volatility	\$4 (9%)	\$1 (3%)	\$0 (0%)	\$11 (12%)
South Australia	Underlying	\$40 (75%)	\$66 (82%)	\$97 (92%)	\$89 (83%)
	Volatility	\$13 (25%)	\$15 (18%)	\$8 (8%)	\$18 (17%)
Tasmania	Underlying	\$38 (92%)	\$92 (96%)	\$97 (99%)	\$83 (97%)
	Volatility	\$3 (8%)	\$4 (4%)	\$1 (1%)	\$3 (3%)

Source: ACCC analysis of AEMO data.

The ESB should undertake market and economic modelling to evaluate individual components of market design or the end-to-end market design. Snowy Hydro believes the modelling should undertake various models with different prices caps and changes in volatilities to understand the impact this would have on market participants, consumers and meeting the NEO.

Snowy Hydro does not believe a move a centralised capacity procurement regime is warranted. In Australia, capacity markets have been examined previously to some extent with the proposed system shown to add complexity to the already complicated electricity market. Under a capacity market, risk is borne by both consumers and either the government or a market operator acting as the facilitator. This would add costs to consumers which currently under an energy-only market has market participants bearing all the risk.

The impact of any new market needs to be considered carefully to avoid any unintended consequences with costs blow outs and unclaimed benefits also modelled.

## Uncertain Regulatory Environment

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 and to respond to the evolving generation mix, policy makers commissioned a myriad of inquiries, reviews and rule changes. This has led to an uncertain regulatory environment which has distorted the energy market design and provided no long term certainty to investors in the NEM. It is critical that the ESB take the impact of these changes into consideration when assessing the market design.

Wholesale electricity market rules can have a material impact on the efficiency of the electricity sector given market participants make long term investment and short term operational decisions. The myriad of proposed and recently implemented changes to the wholesale market design can

<sup>1</sup> ACCC electricity report 2018

provide redundant benefits, send conflicting market signals by reducing market efficiency and result in increased costs to consumers.<sup>2</sup> The recent rule change to alter the basis of the NEM from thirty minute settlement to five minute settlement is an example that can create structural risks that will threaten the sustainability of NEM and increase the risk of further intervention in the market. Market participants have contributed a significant amount of time, which have imposed costs on market participants, and is likely to have adverse consequences to the NEM with higher energy and ancillary service costs.

It is for this reason Snowy Hydro believe the risks associated with energy reforms include:

- unforeseen influences to participant incentives;
- conflicting market signals causing investment uncertainty;
- duplication of payments by consumers; and
- unnecessary costs to the system and market participants<sup>3</sup>.

All of these risks will indirectly be passed through to consumers in the form of increased electricity bills which conflicts with the NEO, which is to maximise efficiency in the long term interests of consumers. Policy design provides a pathway towards increasing efficiency in the NEM but requires a coordinated and deliberate analysis and design. Any changes need to reinforce market signals to participants with little additional cost to the consumer, allocation of risk is consistent, and benefits offered to the market are unique, but complementary. The Issues Paper has correctly noted major changes that are awaiting implementation or are under consideration, and how they will interact with any change to the market design, including:

- Retailer Reliability Guarantee;
- Five-minute pricing and settlement;
- AEMC's coordination of generation and transmission (COGATI) - Access Reform;
- Wholesale Demand Response; and
- Government policy interventions (like the Underwriting of New Generation Investment initiative).

Responsibility for the development of energy policy is spread between the Commonwealth Government, ESB, State Governments and the Australian Energy Market Commission (AEMC). To minimise cost and complexity, it is important for all bodies to identify and evaluate the multiple interactions and interdependencies, and provide a coherent and consistent market reform pathway. There needs to be singular point of judgement that should promote congruence between reforms without increasing complexity of the policy landscape and the number of reforms being considered calls into question whether all pending reforms have been considered holistically and what their impact will be on the electricity market.

## Intervention

Over time contract offers for hedging in the financial markets are impacted if intervention becomes a routine feature of the market, and leads to outcomes contrary to the NEO. The concerning number of increased interventions and impacts was highlighted recently by the AEMC which noted that:

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<sup>2</sup> KPMG, 2019, *“Coordinating electricity market reform: A framework to assess the congruency of wholesale market reforms in the National Electricity Market”*

<sup>3</sup> *ibid*

- *As at late March 2019, around 210 directions have been issued to South Australian generators to maintain system strength, representing an unprecedented use of this intervention mechanism. For the first time in November 2018, AEMO also issued a direction to a generator in Victoria to maintain adequate system strength there.*
- *During 2018, directions were in place for 30 percent of the time on average – a very significant increase relative to the past, and one that is at odds with the principle in the NER that intervention mechanisms should only be used as a last resort.*
- *In South Australia, spot prices in 2018 were on average 10 per cent higher than they would have been had intervention pricing not been applied in connection with system strength directions.<sup>4</sup>*

The ESB need to understand the impact interventions have had on the market as they are a second-best alternative to well-functioning markets at promoting economic efficiency in the long-term interests of consumers. Markets are generally the most efficient mechanism to further the interests of consumers through allowing efficient price discovery and production decisions based on competitive market dynamics. Snowy Hydro therefore believe that the following are key principles that the ESB should always ensure are in place for the use of interventions in the NEM:

- Must only be used as a last resort
- When used they must minimise the distortionary effects to the primary NEM spot and contract markets
- There should be adequate compensation in a timely manner so participants are no worse off than if the intervention had not occurred

Intervention compromises the current market design and its pricing signals, affecting wholesale electricity prices and market signals to investors and the energy and compensation costs faced by consumers. The NEM design gives equal opportunity/incentives on both the supply side (generators) and the demand side. Increased intervention further distorts spot price signals. Longer term customer outcomes are best protected by undistorted pricing signals that provide the investment signal for ongoing investment in new assets.

There are unintended consequences in the market from market intervention. AEMO recently commissioned a paper on intervention pricing by SW Advisory and Endgame Economics<sup>5</sup>. The paper correctly notes that intervention may prevent an immediate problem for the power system but it has the potential to create a new problem. The act of intervening may mute the signal of scarcity provided by the market at a time that we need those signals to be preserved.

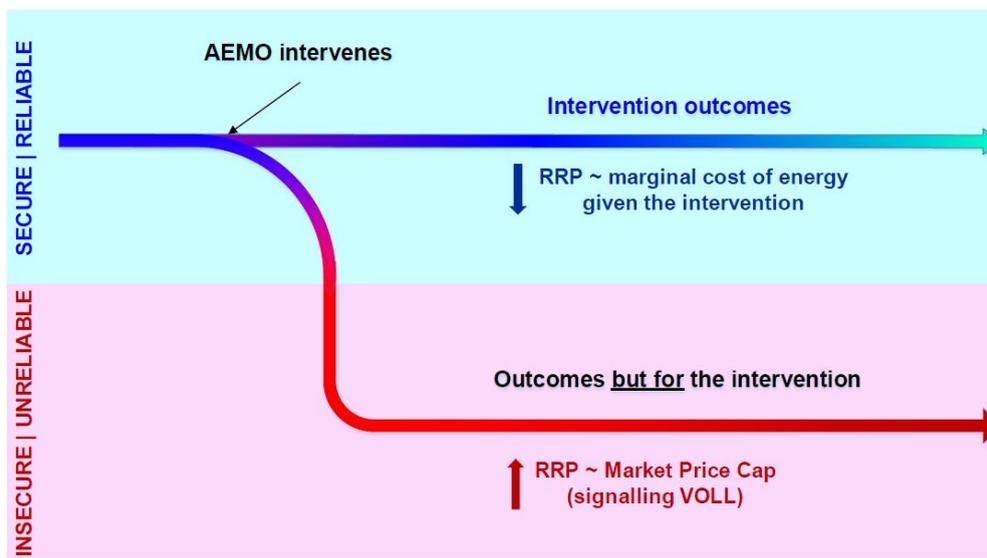
In the absence of the intervention the market outcomes, highlighted in Figure 1, would be associated high price signalling of the scarcity of supply. The prices should signal this scarcity of supply, so as to provide an incentive for generators and loads to respond. The intention of intervention pricing and any type of intervention is to ensure that despite the action of intervening, there is still a signal of scarcity. Further intervention would not achieve this. The products that are being intervened for have been delivered in a market based manner in the NEM.

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<sup>4</sup> AEMC, Investigation into intervention mechanisms and system strength in the NEM, Consultation paper, 4 April 2019, pp ii-iv

<sup>5</sup> SW Advisory and Endgame Economics, 2017, "Review of Intervention Pricing"

Figure 1: Intervention distorts the signal for supply scarcity<sup>6</sup>



Interventions are a form of moral hazard. A situation where economic actors make inefficient decisions because they are able to avoid costs associated with their conduct. This risk of moral hazard is that investors undertake projects without adequately assessing the externalities created by interventions resulting in inefficient investment decisions. Existing participants may be dissuaded from efficient investment because of their belief that market intervention will render investment unnecessary. Interventions should only be used in cases of genuine market failure ensuring that it does not undermine the market it is actually trying to protect. The market should be left to deliver the economic level of bulk supply reliability to customers.

## Potential challenges and risks to the current market

### Market Transparency

Information is important for good investment and operational decisions. Snowy Hydro supports efforts to restart the Australian Financial Markets Association (AFMA) Over The Counter (OTC) electricity derivative turnover report. The survey allows greater visibility of the electricity trading hedging products allowing an extra source of information for public use. This transparency is important to allow providers of risk management products to make available contracts which are efficiently priced. Increased and enhanced transparency in reporting improve the ability of retailers, consumer groups, governments and policy makers to explain the costs and benefits of the intervention to consumers.

The ESB should promote transparency in areas that are currently quite opaque as well as being predictable, so that market participants can make efficient investment and operational decisions. The AEMC recently worked to enhance the transparency of the Reliability and Emergency Reserve Trader (RERT). As noted in the recent Enhanced RERT Final Determination the increased transparency and reporting will assist market participants and consumers in planning for RERT costs.

<sup>6</sup> SW Advisory and Endgame Economics, 2017, "Review of Intervention Pricing"

Market bodies and operators also need to be transparent and to issue reports in a timely manner, providing factual evidence of an intervention within a reasonable period after intervening.

## Dispatchability, flexibility and Snowy 2.0

The ESB should understand that for an electricity system to work properly and contribute to reliability it needs to involve efficient investment, retirement and operational decisions by market participants resulting in an adequate supply of generation capacity, including sufficient dispatchable capacity to maintain a balance of supply and demand.

Snowy 2.0 is expected to help provide flexible and dispatchable resources. Central to the Retailer Reliability Obligation, 'dispatchable' should mean that the source is able to be centrally dispatched in the spot market, its intentions are known to the Market Operator and Market Participants, it has the same obligations as scheduled generators in the NEM to follow dispatch, and it must act in good faith as per the relevant provisions in the National Electricity Rules. The source must also have a high level of reliability such that it can be relied on to start-up and supply energy when it is required.

With the energy industry's investment focus shifting to a combination of firm lower emissions gas generation, renewables and enabling technologies, more than 3,000 megawatts of firm generation exited the market in Australia over the last few years. The inclusion of dispatchable generation however such as the Snowy Hydro pumped hydro expansion (Snowy 2.0), which was included in the National Energy Guarantee (NEG) modelling scenarios, is expected to help provide the flexible and dispatchable resources required. For the ESB to best assess the economic modelling to evaluate individual components of market design or the end-to-end market design the inclusion of Snowy 2.0 needs to be included as a committed project.

Snowy 2.0 is expected to help the NEM transition to meeting Australia's commitment to reduce emissions by 26 per cent to 28 percent of 2005 levels by 2030 and maintain reliability. The 2,000MW of additional, dispatchable, and flexible hydro generation will play a key enabling role to support the increase in penetration of intermittent generation such as wind, rooftop PVs, and large-scale solar. This additional hydro generation will provide ancillary services such as inertia and spinning reserve which are not available from asynchronous generation from wind and solar.

## Investment

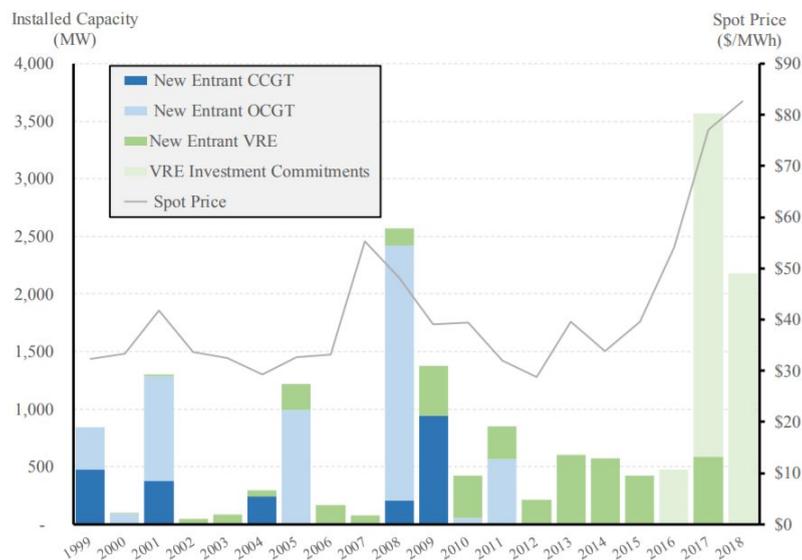
The Issues Paper states that *"future market design will need to provide sufficient incentives for efficient investment in firm, dispatchable generation or storage throughout this transition"*.<sup>7</sup> Snowy Hydro believes the NEM's history of new entry in response to price spikes and the continual meeting of reliability is indicative of a market that is free of significant barriers to entry. In recent years the entrant of choice in the Australian market has switched to Variable Renewable Energy (VRE), principally wind and solar PV. Their material and timely reduction in entry costs along with an undersupplied 20 per cent Renewable Energy Target helped drive a cyclical investment boom<sup>8</sup> as Figure 2 and 3 show.

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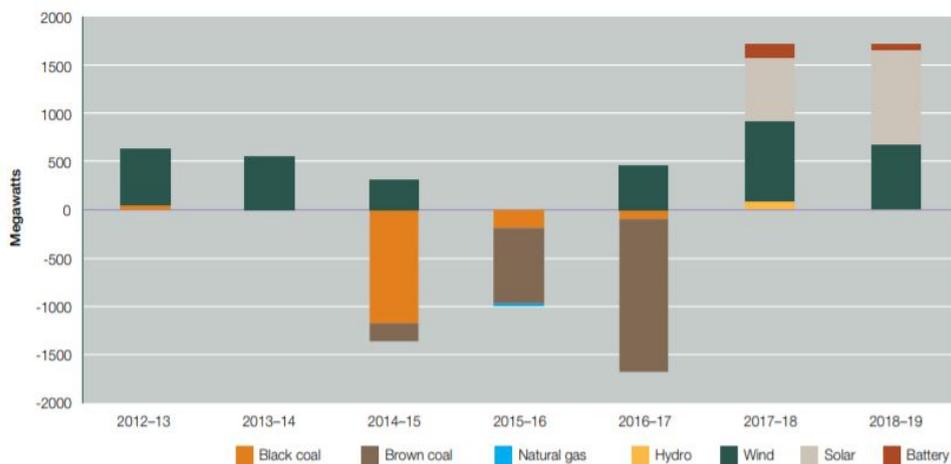
<sup>7</sup> Energy Security Board, 2019, "Post 2025 Market Design Issues Paper"

<sup>8</sup> Lessons from Australia's National Electricity Market 1998-2018: the strengths and weaknesses of the reform experience", Paul Simshauser, University of Cambridge Energy Policy Research Group, July 2019.

**Figure 2: New entrant plant (1999-2017) and investment commitments (2017-2018)<sup>9</sup>**



**Figure 3: New Investment and capacity withdrawals in the NEM<sup>10</sup>**



The ESB’s priority must be to maintain a reliable power system with adequate market signals and a market open for all participants, without incentivising plant with specific characteristics.

The suggestion that Snowy 2.0 may suppress investment in firm generation is however incorrect. The growth in variable renewable energy requires significant investment in firm generation. There is no crowding out when the industry is suffering from under-investment in firm generation; that is one of the most important issues that needs to be resolved. Snowy 2.0 will not dissuade investment in firm capacity rather it is a need required to complement the variable renewable energy investment boom.

Snowy 2.0 is not the product of government support. Snowy 2.0 was conceived under Snowy Hydro’s previous ownership structure (before the Commonwealth acquired the shareholdings of NSW and Victoria) and has been subject to a commercially rigorous assessment at every step of its

<sup>9</sup> Lessons from Australia’s National Electricity Market 1998-2018: the strengths and weaknesses of the reform experience”, Paul Simshauser, University of Cambridge Energy Policy Research Group, July 2019.

<sup>10</sup> AEC State of the Energy Market 2018

development. The linking of Snowy 2.0 with government underwriting of commercial investment more generally is concerning. Snowy 2.0 is not another UNGI project and has no proposed UNGI projects, it is a commercial investment which requires no government support.

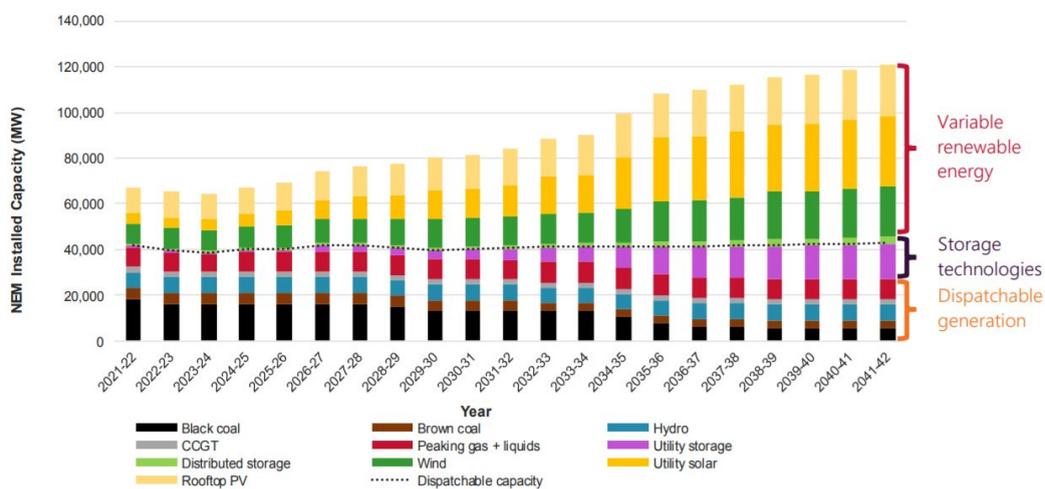
## Transmission

Transmission is currently the single most important issue in the NEM and beyond. The timely decisions made today will determine the direction and sustainability of the NEM for decades. There is a critical need to progress transmission upgrades to ensure the timely integration of renewables and large scale storage into the grid. 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.

Snowy Hydro believes network investment has been poorly planned and targeted, and that this has been a major cause of high electricity prices. However, while there has been a historical over-investment in the distribution network, more recently there has been a lack of strategic transmission investment. The NEM needs timely and necessary improved transmission interconnection between SA, VIC, NSW and QLD which will increase competition in wholesale markets helping to reduce prices. In addition greater transmission interconnection between States would massively reduce the threat of reliability issues across the NEM.

The NEM is past the tipping point of firmed renewables being the most economic form of new generation, with AEMO identifying the need for up to 15 GW of utility scale storage between now and 2040<sup>11</sup> which highlights the need for storage in the NEM, displayed in Figure 4. This long term view in the post 2025 market design must therefore seriously consider not only the immediate and growing need for storage, but must also address the long-term requirement for connecting up to 15 GW of utility scale storage which, from the perspective of energy security and low cost to consumers, must include significant amounts of deep storage.

**Figure 4: Forecast NEM generation capacity in the ISP insights development plan, Neutral scenario**  
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<sup>11</sup> AEMO, 2019, "Building power system resilience with pumped hydro energy storage: An Insights paper following the 2018 Integrated System Plan for the National Electricity Market", pp7

<sup>12</sup> AEMO, 2019, "Building power system resilience with pumped hydro energy storage: An Insights paper following the 2018 Integrated System Plan for the National Electricity Market", pp7

Failure to commit to appropriate infrastructure now will hinder the transition which places greater importance on the connection of strategic projects. A core foundation of a smooth transition in the NEM is an actionable ISP with the timelines of interconnection for strategic projects vital. Snowy Hydro believe the ISP should be the base of any future market design and should be incorporated in the assessment of future market design.

The ISP is able to show the economic benefits under all scenarios including the timing of some elements under different assumptions, particularly relating to the rate of change and the progress of proposed major energy storage initiatives. The Regulatory Investment Test for Transmission (RIT-T) process in the current form is too slow for delivering timely strategic transmission projects unless it also includes a more actionable ISP. The current RIT-T process is:

- unduly lengthy, and possibly exceeding 18 months after publication of a project specification consultation report;
- creates an “chicken and egg” dilemma, in which major generation projects require certainty regarding transmission investment in order to proceed, but transmission investment is delayed by the RIT-T, and may be dependent on the major generation project first being committed;
- does not consider strategic benefits valued by consumers under the RIT-T which is limited and broader risks such as political, regulatory, and social risks are not adequately captured for low probability but high impact events;
- favours incremental development in generation and transmission, which can be more expensive for consumers in the long run; and
- delayed by individual interests through the disputes process.

## International Studies and Non-NEM state comparisons

Snowy Hydro cautions that care must be taken by the ESB in making comparisons to the rest of the world or to non-NEM states which are very different markets. In major markets in North America and across most European markets a key function across these markets is the efficient coordination of electricity transactions with neighbouring power markets which is not relevant in the NEM. The NEM is not connected to neighbouring power markets.

One market the ESB could assess however is the Alberta electricity market. Alberta’s electricity market had announced the transition from their current energy-only market to a capacity market. The growing concerns that the existing electricity market structure would not attract sufficient investment from conventional generation due to the increased penetration of zero marginal cost renewable generation was a key reason for the move. However, recently the United Conservative Party, a conservative political party in Alberta, cancelled the planned overhaul. The overhaul of Alberta’s electricity sector was expected to end up costing consumers hundreds of millions of dollars, up to \$1.4 billion, in unnecessary and additional costs, according to consumer groups and key players in the power sector in the USA.

In assessing the non-NEM electricity markets, such as Western Australia it is important to note that it is very different to the NEM. The Western Australian example which is the Wholesale Electricity Market (WEM) has a capacity mechanism and is not an energy-only market. The market demographic is very different in the WEM as the continued dominance of Synergy in the WEM

means that market power remains a headline concern in the market compared to the NEM where there are numerous vertically-integrated businesses operating.