13 March 2020

Australian Energy Market Operator
GPO Box 2008
Melbourne VIC 3001

Submitted by email to VNIWestRITT@aemo.com.au

Victoria to New South Wales Interconnector West (VNI West) Regulatory Investment Test for Transmission Project Specification Consultation Report (PSCR)

Snowy Hydro Limited welcomes the opportunity to comment on matters raised in the Regulatory Investment Test for Transmission Project Specification Consultation Report (PSCR) from the Australian Energy Market Operator Limited (AEMO) and TransGrid on the Victoria to New South Wales Interconnector West (VNI West).

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 has experienced unprecedented and transformational changes and is now past the tipping point of firmed renewables becoming more economic than thermal plant. The NEM is experiencing a once-in-a-generation opportunity to secure an orderly transition to a truly interconnected and reliable grid dominated by renewables. Failure to commit to appropriate infrastructure now will hinder the transition.

To accommodate the energy transition occurring in the NEM, the timely decisions made on VNI West will support the direction, cost effectiveness and sustainability of the grid for decades. The Draft 2020 AEMO Integrated System Plan (ISP) noted that *"costs would mount significantly if Yallourn retired earlier than currently anticipated and VNI West was not in place"*[1]. AEMO note the risk of significant added costs for consumers, as experienced both when Northern Power Station closed in South Australia and when Hazelwood Power Station closed in Victoria[2]. The VNI West project will mitigate the risk of high costs to consumers if the next brown coal-fired generation retirement in Victoria occurred earlier than announced.

This all pressages the urgency of VNI West and the connection to firm generation. The risks are too high to delay the crucial sections of these upgrades. The proposed expansion addresses the identified transmission network limitations to ensure the power system continues to deliver least-cost, secure and reliable energy to consumers. The new interconnector will enable Victorian and NSW consumers to access lower cost generators across State borders, enable the connection of new generators that will replace those power stations scheduled to retire, and improve the reliability of supply.

Timely commissioning of VNI West will provide system resilience to cater for unplanned early exit of coal plant, by allowing Snowy 2.0 to firm Victoria's renewable energy targets output and capture

[1] Draft 2020 AEMO ISP
[2] Draft 2020 AEMO ISP

excess or low value generation for discharge during times of energy scarcity. This will facilitate orderly transition to the future renewables dominated power system.

VNI West connects Victoria with New South Wales and Snowy 2.0 through Kerang or Shepparton however the route selection Snowy Hydro believes is best determined by the variable renewable energy (VRE) development priorities in local areas. Each option provides Victoria with access to Snowy Hydro's existing and future generation capacity, and helps alleviate constraints from renewable investment in the north west or central areas of Victoria.

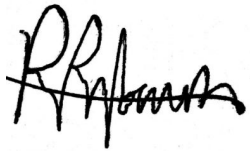
In reviewing the Options presented in the PSCR, Snowy Hydro considers that, given the long-term identified need for storage as the proportion of renewables in the system increases, coupled with the difficulty in developing large transmission assets within the timeframe presented by the acceleration in the renewable energy transformation, there is an immediate need to embrace a longer term view in the VNI West Network proposal. Snowy Hydro's preference from the network options identified in the PSCR is the development that best addresses benefits to all shared network users.

Snowy Hydro's preferred option is VNI 7 which is the new 500 kV transmission lines from North Ballarat – Bendigo – Kerang – Darlington Point – Wagga. This option provides Victoria with access to Snowy Hydro's existing and future generation capacity, and helps alleviate constraints from renewable investment in the north west or central areas of Victoria. The VNI 7 option will be critical in releasing the significant amount of renewable investment in West Murray which is currently in a remote and electrically weak part of the NEM.

The VNI West commissioning date should be no later than 2025 which aligns with Victoria's renewable energy targets (VRET) target date. This date will provide system resilience to cater for unplanned early exit of coal plant, by allowing Snowy 2.0 to firm VRET output and capture excess or low value generation for discharge during times of energy scarcity, and will facilitate orderly transition to the future renewables dominated power system. The latest commissioning date should be no later than 2026-27 which is consistent with the draft ISP modelling.

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

Yours sincerely,



Panos Priftakis
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Snowy Hydro

Detailed Submission

Identified need for investment

AEMO's recent 2020 Draft ISP and ISP Insights update highlights the importance of accelerating VNI West which is both important and unavoidable to prevent reliability issues and ensure decarbonisation at lowest cost. Snowy Hydro therefore supports the identified need noted by AEMO/TransGrid for additional transfer capacity between New South Wales and Victoria to realise net market benefits by:

- *"Efficiently maintaining supply reliability in Victoria following the closure of further coal-fired generation and the decline in ageing generator reliability – including mitigation of the risk that existing plant closes earlier than expected.*
- *Facilitating efficient development and dispatch of generation in areas with high quality renewable resources in Victoria and southern New South Wales through improved network capacity and access to demand centres.*
- *Enabling more efficient sharing of resources between NEM regions".*[3]

Closure of coal-fired generation

"EnergyAustralia has officially announced a staged closure of Yallourn Power Station between 2029 and 2032, which is up to three years earlier than projected in the ISP 2018."[4] Provided there is no substantial change in the market this allows EnergyAustralia to retain the option to close Yallourn as soon as it cannot operate profitably. However greater penetration of wind and solar is already increasing the incidence of zero and negative-price periods which will make Yallourn unsuited to this volatility which may require it to likely retire well before 2029. AEMO's 2019 ESOO[5] has also shown that the reliability of the ageing brown coal generation fleet in Victoria continues to decline which further increases the risk of larger, or more rapid, withdrawals than initial projections.

If Yallourn retired earlier than currently anticipated and the VNI West was not in place the AEMO 2020 ISP notes that costs would mount significantly. The significant added costs for consumers would be equivalent to those experienced both when Northern Power Station closed in South Australia and when Hazelwood Power Station closed in Victoria. The Draft 2020 ISP notes that if Yallourn or an equivalent plant in Victoria were to close in 2026-27, and VNI West was not in operation until 2031-32, $118 million regret cost is estimated[6]. It is therefore important that the shared transmission is upgraded to ensure that the power from Snowy 2.0 reaches consumers and the risk of high costs to consumers if the next brown coal-fired generation retirement in Victoria occurred earlier than announced are avoided.

Facilitating high growth of renewables

At the same time, Victoria's renewable energy targets (VRET) must be supported by large scale storage so that excess or low value generation can be captured for discharge during times of energy scarcity, and critically, to provide requisite risk and contingency management to ensure the future energy security of the NEM as we decarbonise.

[3] Victoria to New South Wales Interconnector West (VNI West) Regulatory Investment Test for Transmission Project Specification Consultation Report (PSCR), pp4

[4] Victoria to New South Wales Interconnector West (VNI West) Regulatory Investment Test for Transmission Project Specification Consultation Report (PSCR), pp20

[5] AEMO 2019 ESOO

[6] AEMO, 2019, *"Draft 2020 Integrated System Plan", pp57*

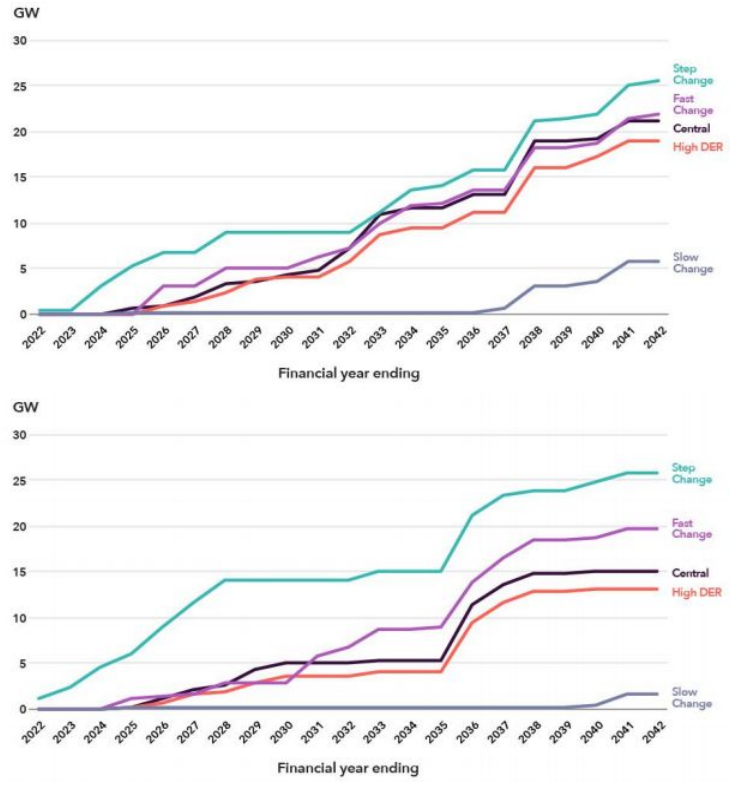
The business case and final investment decision for Snowy 2.0 is dependent on the transmission upgrades in NSW and Victoria being available from late 2024 to no later than 2025, when we expect the Snowy 2.0 units to be fully commissioned. It is therefore essential that the timing for VNI West enable this critical project to proceed to best meet the needs of the future NEM.

The growth in large-scale renewables and rooftop solar is also reducing average scheduled demand, while demographic trends and changing usage patterns are increasing maximum net demand. In short, energy is abundant but firm capacity is increasingly scarce. Firm capacity such as Yallourn is being continually displaced by variable renewable generation, increasing the mismatch between maximum demand and the firm capacity available to service it.

VNI West ensures that the inter-regional capacity provided by VNI West is available to facilitate the orderly transition to renewables and ensure ongoing energy security across the two largest NEM regions.

Snowy Hydro notes the increased recognition of the benefits of interconnection and hydro storage in the 2020 AEMO Draft ISP. The 2020 AEMO ISP identifies the development of up to over 30 GW of new grid-scale renewables is needed in all but the Slow Change scenario which will replace approximately 15 GW or 63 per cent of Australia's coal-fired generation that will reach the end of its technical life and so likely retire by 2040. In the Step Change scenario for the ISP methodology, up to 47 GW would be required, with Queensland and New South Wales forecast to add over 15-18 GW and Victoria over 6 GW by 2040[7].

Figure 1 New NEM VRE build, solar (top) and wind (bottom)[8]



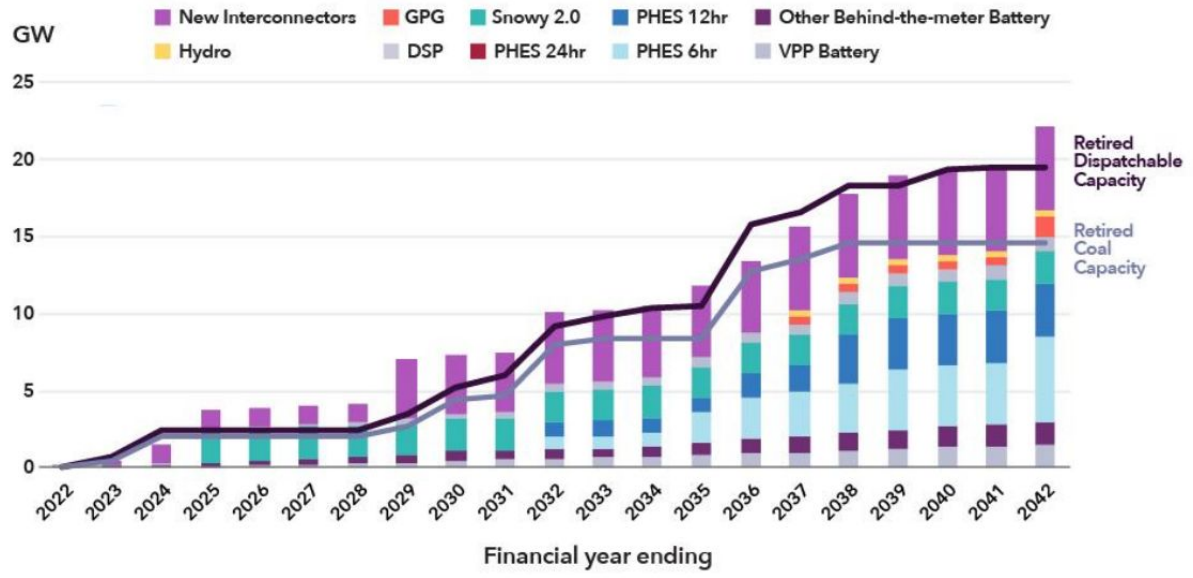
[7] AEMO, 2019, *"Draft 2020 Integrated System Plan", pp40*

[8] AEMO, 2019, *"Draft 2020 Integrated System Plan"*

The transmission grid therefore needs targeted augmentation to provide capacity, balance resources and unlock Renewable Energy Zones (REZs) in both Victoria and NSW. The most cost-effective way to provide this required connection capacity for VRE is to develop strategically placed interconnectors in conjunction with REZs. VNI West is critical to the transition.

Further to this, in analysing the need for new dispatchable resources, the AEMO Draft 2020 ISP notes that 5-21 GW of new dispatchable resources, such as utility-scale pumped hydro or battery storage, are needed in support[9]. This is to firm up the inherently variable distributed and large-scale renewable generation. According to the AEMO 2020 ISP the growth in storage is broadly aligned with timing of coal-fired generation retirements, as shown in Figure 4. *"New interconnectors are also included in this figure as they also help to smooth out local VRE variability by increasing resource diversity across the system."*[10]

Figure 2: Announced retirements and corresponding builds in Central scenario to help firm VRE[11]



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.

Credible options

In considering the options to address the identified need Snowy Hydro believes the chosen option must maximise the net economic benefits to all those who produce, consume, and transport electricity in the NEM. Snowy Hydro's preferred option is VNI 7 which is the new 500 kV transmission lines from North Ballarat – Bendigo – Kerang – Darlington Point – Wagga. This option will provide more connection options for Victoria's renewable energy targets (VRET).

With Snowy 2.0 expected in 2024/25 it is important that this significant pumped hydro storage in this area is timely and with necessary transmission infrastructure to complement the growth in variable renewable energy (VRE).

[9] AEMO, 2019, *"Draft 2020 Integrated System Plan", pp10*
[10] AEMO, 2019, *"Draft 2020 Integrated System Plan", pp46*
[11] Source: AEMO 2020 ISP

Options VNI 7 provides Victoria with access to Snowy Hydro's existing and future generation capacity, and helps alleviate constraints from renewable investment in the north west or central areas of Victoria. The least cost modelling of the options, which TransGrid and AEMO has assessed, must cover the full spectrum of benefits arising from transmission development, which include:

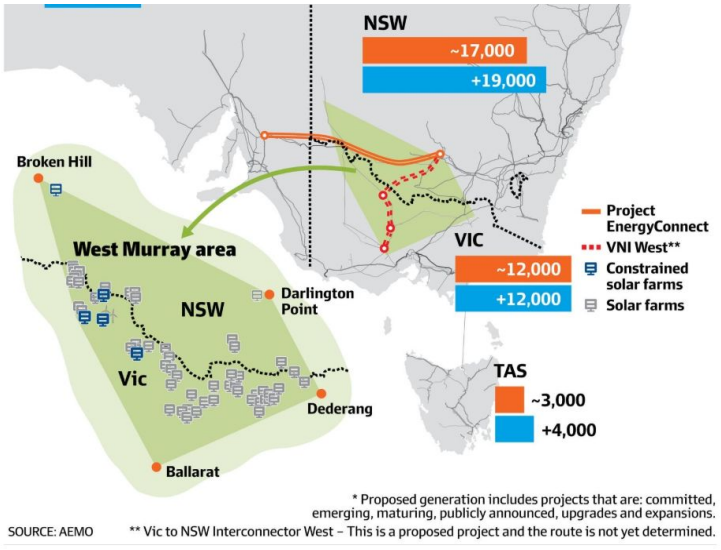
- reliability, security and resilience (for example, unexpected loss of coal thermal plant);
- risk and contingency management (for example, bushfires or other natural disasters);
- value arising from topology optimisation and operational flexibility; and
- orderly transition to a renewable energy system,

All of which are ultimately the high value drivers for energy security in a renewables dominated NEM. Snowy Hydro's preference from the network options identified in the PSCR is the development that best addresses benefits to all shared network users, allows for staged and early Victorian capacity benefits. We therefore consider a development of VNI 7 best addresses the broader needs of the shared network users, and allows a scalable option which, if accelerated to be completed. This will deliver more benefits than VNI 5A, as noted by the PSCR:

- *"Unlocking areas with high quality renewable resources in Victoria and south-western New South Wales, and providing access to existing and projected pumped hydro storage in the Snowy region.*
- *Providing additional transmission from generation and other energy resources to load centres in Victoria and New South Wales to support these states during high demand periods.*
- *Providing larger overall transfer capability between Victoria and New South Wales.*
- *Diversifying interconnector paths."*[12]

The area of the Victorian and NSW power system bounded by Ballarat, Dederang, and Darlington Point is known as the 'West Murray' zone has attracted significant investment in grid-scale solar and wind generation, despite being a remote and electrically weak part of the NEM. An important long term solution will be VNI 7 option which will support the West Murray zone as it enables the connection of a significant amount of renewable energy as shown below in Figure 3.

Figure 3: Map of West Murray Zone[13]



[12] Victoria to New South Wales Interconnector West (VNI West) Regulatory Investment Test for Transmission Project Specification Consultation Report (PSCR), pp31

[13] Source: AEMO

Snowy Hydro believes that the estimated notional increases in the export and import transfer capacity of Victoria to New South Wales interconnection (VNI) are very important. Should the VNI 7 option not be the preferred option then the chosen option must maintain the 1,930MW VNI export increase and 1,800 MW notional VNI Import increase. This would make the VNI 6-VI option the second best option for Snowy Hydro.

Timing

Ensuring that the inter-regional capacity provided by VNI West is available to facilitate the orderly transition to renewables and ensure ongoing energy security across the two largest NEM regions is vital for the energy market. The PSCR notes that following completion of the RIT-T process the options are expected to be completed by 2026-27 which is consistent with the draft ISP modelling which indicates optimal timing for delivery.

There are strong justifications however for bringing VNI West forward, including route diversification for the existing VIC-NSW interconnection (which is regularly impacted by bushfires), mitigation against Basslink cable failure (noting the precarious condition of the cable), and helping increase competition by allowing generation to flow freely between the NEM's two biggest regions.

Snowy Hydro believes that the VNI West commissioning should be no later than 2025 the Victoria's renewable energy targets (VRET) target date. This target date will provide system resilience to cater for unplanned early exit of coal plant, by allowing Snowy 2.0 to firm VRET output and capture excess or low value generation for discharge during times of energy scarcity, facilitating an orderly transition to the future renewables dominated power system.

To reduce the time of completion Snowy Hydro would support a staged development of these options which could provide additional benefits and we support the stage options to be explored during the PADR stage to determine a proposed preferred option that maximises net benefit.

Route diversity

Snowy Hydro believes there is significant value of diversifying the geographic interconnector routes between Victoria and New South Wales. The recent bushfires have demonstrated the compelling need for new transmission links and diversity of transmission paths. New transmission lines will bolster the diversity of supply, from both systemically-important projects like Snowy 2.0 as well as from geographically-diversified sources of variable renewable energy.

In the long term it is important in future proofing Australia against natural disasters. In the recent bushfires, transmission links from Snowy linking NSW and Victoria were shut down by AEMO due to damage from bushfire smoke, leading to a temporary loss of reserve capacity for the NSW and Victorian markets.

It is therefore important to increase the route diversity which will increase the availability of interconnection between Victoria and New South Wales which would create a more resilient power system as it mitigates against the potential impacts of extreme weather events.

Additional expansions to unlock REZs

Snowy Hydro supports AEMO and TransGrid considering additional augmentations on existing transmission paths to better facilitate the development and dispatch of generation in high quality

renewable resource areas. The additional expansions are expected to unlock a further 2,000 MW of capacity and would work efficiently with the combination of respective options Snowy Hydro's preferred options will pass through high pass through identified areas of high quality renewable resources. The additional expansion provides a long term view which considers the growth of renewables through the connection of REZ's.