

Chapter 2: Project rationale

Environment Effects Statement



2 Project rationale

This chapter sets out the rationale for the Victoria to New South Wales Interconnector Project (VNI) West (Victorian component) (the Project). In accordance with the Environment Effects Statement (EES) Scoping Requirements, it describes the strategic context in which the Project is proposed, why the Project is needed, its relationship to relevant policies, plans and strategies and what could happen if the Project does not proceed. Detailed explanations of project development, alternatives assessment and design refinement are provided in *EES Chapter 3: Project development and alternatives*, while the Project itself is described in *EES Chapter 4: Project description*.

2.1 Introduction

VNI West is proposed in the context of a fundamental transition in Victoria's and the broader National Electricity Market (NEM) electricity system. The Project objectives are to:



Facilitate the transmission of renewable electricity generated in renewable energy zones in Victoria and New South Wales



Strengthen transfer capability between Victoria and New South Wales within the National Electricity Market



Maintain the security and reliability of the Victoria–New South Wales electricity network as coal-fired generation progressively retires.

As described in *EES Chapter 1: Introduction* and *EES Chapter 4: Project description*, the Project comprises the Victorian component of VNI West, being a proposed new 500 kilovolt (kV) double-circuit overhead transmission line and associated infrastructure extending from Bulgana in western Victoria to the Murray River north west of Kerang, together with a new terminal station at Tragowel, related network connection works, temporary construction laydown areas, temporary workforce accommodation areas and other temporary works.

Figure 2-1 provides an overview of the Project and its relationship to the broader future transmission network context between western Victoria and New South Wales (NSW). The figure shows the Project alongside current and proposed transmission developments that are under development, delivery or planned within the NEM. It is intended to illustrate the Project's strategic network context and does not depict the full existing electricity transmission network or all existing interconnections between Victoria and NSW.



Figure 2-1 VNI West in the future transmission network

2.2 Strategic context for the Project

International and national climate policy provides the broader context for the transition of Australia's electricity system. The Paris Agreement was adopted in 2015 and signed by Australia in 2016. It seeks to strengthen the global response to climate change by holding the increase in global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit warming to 1.5°C. More recent international commitments including the COP28 outcome reinforce the scale and pace of change required in the electricity sector. Under that outcome, Parties to the United Nations Framework Convention on Climate Change, including Australia, agreed to accelerate the transition away from fossil fuels in energy systems and triple global renewable energy capacity by 2030.

Australia's national climate policy settings form part of the way it gives effect to its international climate commitments, including under the Paris Agreement through its Nationally Determined Contributions. In that context, Australia's updated 2035 emissions reduction target of 62–70% below 2005 levels, together with its commitment to achieve net zero emissions by 2050, contributes to the broader transition required in the electricity sector. Victoria's policy and legislative framework reinforces that direction at the state level, including renewable energy targets of 65% by 2030 and 95% by 2035, together with economy-wide emissions reduction targets of 75–80% below 2005 levels by 2035 and net zero emissions by 2045.

Meeting these commitments and targets will require a large-scale build-out of renewable generation, storage and transmission infrastructure within a relatively short timeframe. The transmission infrastructure is required not only so that renewable electricity generation can connect to the grid, but also so that renewable energy can be transferred efficiently between regions, and electricity supply can remain secure and reliable as the generation mix changes.

A central feature of this transition is that future generation is increasingly being developed in locations with strong wind and solar resources rather than near existing thermal generators or major load centres. Western Victoria and adjacent parts of southern NSW are important in this regard because of the scale and quality of their renewable energy resources and the level of existing and proposed renewable development. The transmission network needs to adapt so those resources can be connected and their contribution to future supply realised efficiently.

This need has been recognised in national and state electricity planning frameworks. The 2017 Independent Review into the Future Security of the NEM recommended developing renewable energy zones (REZs) before significant amounts of coal-fired generation exit the market, along with investment in transmission to unlock the REZs. It also recommended that the Australian Energy Market Operator (AEMO) identify priority projects to enable the efficient development of the REZs in each market region. Following that review, AEMO's 2018 Integrated System Plan (ISP) identified access to renewable energy in western and north-western Victoria as a development where immediate investment should be undertaken, with completion as soon as practicable.

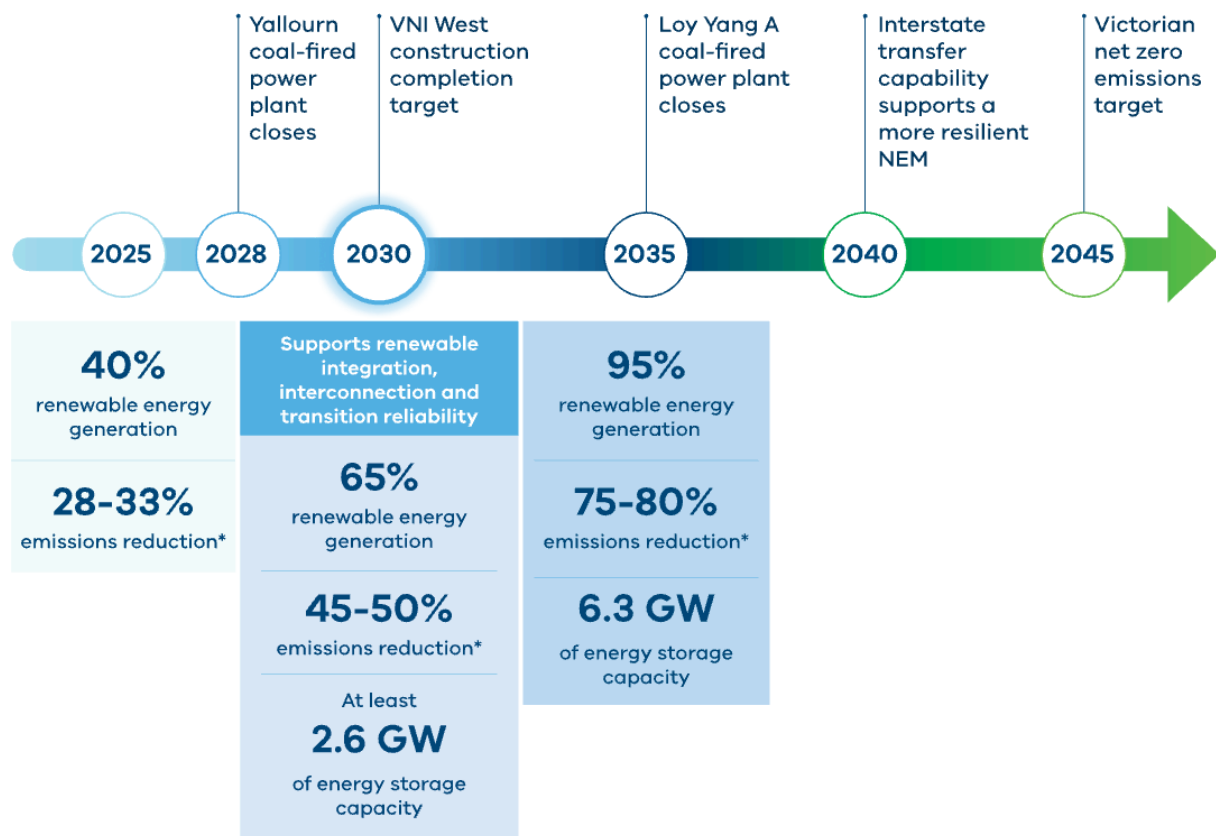
The Victorian Renewable Energy Zones Development Plan Directions Paper (2021) observed that many renewable energy projects in Victoria were experiencing lengthy and costly connection processes and restrictions because existing transmission infrastructure was approaching capacity limits or was constrained by low system strength. It identified immediate priority transmission upgrades to support existing and future renewable energy generation, including VNI West.

The 2026 ISP reinforces this planning context at a broader system level. It states that renewable energy, connected by transmission and distribution, firmed with storage and backed up by gas, presents the least-cost way to supply secure and reliable electricity to consumers through to 2050 as coal plants retire and government policies are implemented. It also states that the electricity grid is needed to connect these diverse resources to consumers, improve renewable energy diversity and weather resilience, and that new transmission augmentations will be vital to navigate the energy transition at the lowest cost for consumers.

At the Victorian level, the Victorian Transmission Plan (VTP) also recognises the need for transmission investment to support the State's energy transition. Both the ISP and the VTP identify VNI West as a key component for delivering a more renewables-based electricity grid and meeting the renewable energy targets. The key planning frameworks consistently identify VNI West as part of the transmission development needed to support renewable integration, strengthen interconnection and maintain system reliability.

In practical terms, the Project aligns with this policy and planning context in three related ways. First, it would facilitate the transmission of renewable electricity generated in REZs in Victoria and NSW. Secondly, it would strengthen transfer capability between Victoria and NSW across the NEM, allowing electricity to be moved more efficiently between regions. Thirdly, it would help maintain energy security and reliability as coal-fired generation progressively retires and the generation mix changes.

Figure 2-2 summarises selected electricity system transition milestones relevant to VNI West, including renewable electricity targets, coal-fired generation retirement assumptions and the Project's intended delivery timing.



*Below 2005 levels

Figure 2-2 Selected electricity system transition milestones relevant to VNI West (adapted from VTP 2025)

Accordingly, the Project is not proposed in isolation from the policy and planning framework. It is proposed as part of the wider set of transmission investments required to implement Victoria's renewable electricity and emissions reduction commitments, strengthen the interregional network and maintain the reliability and security of supply during a period of major structural change. This is also consistent with the relevant Victoria Planning Provisions that support electricity transmission and associated infrastructure, including Clause 19.01-1S (Energy Supply).

Table 2-1 summarises the relationship between the Project rationale and the key policies, plans and strategies relevant to the Project.

Table 2-1 Relationship between Project rationale and key policies, plans and strategies

Policy/plan/strategy	Key direction	Relevance to VNI West
Victorian renewable electricity targets	Increase renewable electricity supply in Victoria.	Supports the transmission capacity needed to connect and transport renewable electricity.
Victorian emissions reduction and net zero commitments	Reduce emissions from the electricity sector and economy.	Supports decarbonisation of electricity supply and replacement of higher-emissions generation.
Integrated System Plan	Identify strategic transmission development required for the future NEM.	Recognises the role of major transmission augmentation in connecting REZs, strengthening interconnection and maintaining reliability.
Victorian Transmission Plan	Guide transmission development needed for Victoria's energy transition.	Identifies VNI West as part of the network development needed to support a more renewables-based grid.
Renewable energy zone policy and planning framework	Facilitate efficient development of renewable generation in priority areas.	Supports connection and efficient use of renewable generation in western Victoria and connected regions.
Victoria Planning Provisions, Clause 19.01-1S, Energy Supply	Facilitate the provision of energy supply infrastructure in appropriate locations.	Supports the planning policy basis for electricity transmission and associated infrastructure.

2.3 Why the Project is needed

2.3.1 Renewable energy zones and network access

The Project is needed because a growing share of future electricity supply is expected to come from REZs in Victoria and NSW, and those resources require transmission capacity to operate efficiently.

REZs are intended to support coordinated development of generation in areas with high-quality renewable resources. In Victoria, the Western REZ and the North West REZ are expected to make an important contribution to the State's future electricity supply.

The 2021 Directions Paper identified planned REZs in Victoria, including the Western REZ and the North West REZ, and noted that existing transmission infrastructure was constraining the development of new renewable projects.

At times of maximum wind generation in 2022, the transmission lines servicing the Western REZ were approaching the maximum amount of electricity they could safely carry. As more generation seeks to connect in the region, the capacity of the transmission network becomes increasingly important. When the network cannot accept additional electricity, generators must reduce output and may be subject to curtailment. Curtailment of renewable generation in Victoria has increased as renewable development has grown, and transmission constraints have been identified as a major obstacle to further development in western and north-western Victoria.

The Project is intended to address that constraint by increasing transmission capacity and improving access to renewable generation in western Victoria and southern NSW. In doing so, it would support more efficient connection, dispatch and use of existing and future renewable generation, including by reducing the extent to which network constraints contribute to curtailment or restrict the benefit of those resources.

Figure 2-3 shows Victoria's renewable energy zones and the strategic transmission development identified to support renewable energy integration, including the Project.

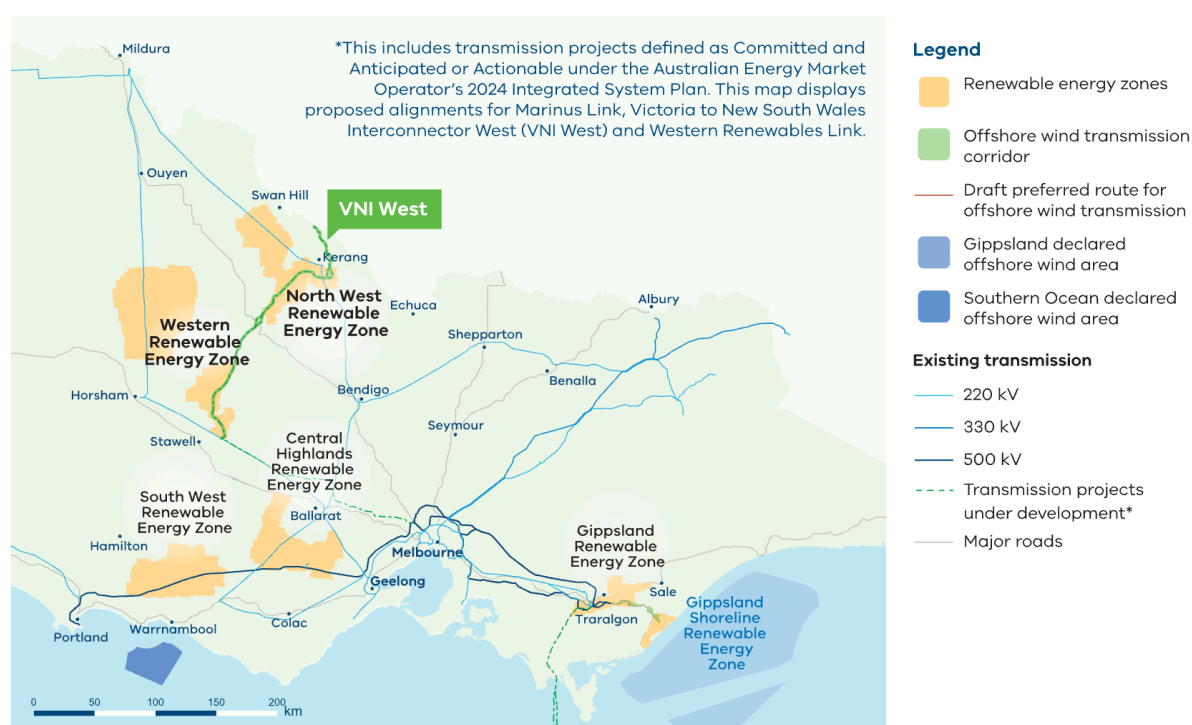


Figure 2-3 Renewable energy zones and strategic transmission development in Victoria

2.3.2 Interregional transfer capability and access to diverse resources

A further driver for the Project is the need to strengthen transfer capability between Victoria and NSW and to improve access to geographically diverse generation and firming resources, such as storage and other resources that can respond when needed to balance variable renewable generation across the NEM. This broader interregional context also includes access to resources available across the wider interconnected market, including South Australia, even though the primary function of VNI West is to strengthen the Victoria–NSW connection.

Interconnectors enable the NEM to operate more cohesively by allowing electricity generated in one region to meet demand in another. This becomes increasingly important in a system with higher renewable penetration, because supply conditions vary across regions and technologies. A highly interconnected system can better draw on diversity in geography, weather conditions, storage and demand patterns.

Technical Appendix O: Business and economics of this EES identifies the Project as being capable of carrying clean, low-cost renewable power from REZs and connected renewable generation areas in Victoria and southern NSW, harnessing more than 3.4 GW (gigawatt) of new renewable generation in the North West and the Western REZs, and adding 1.9 GW of export capacity from Victoria to NSW and 1.7 GW of import capacity from NSW to Victoria. *Technical Appendix O* also identifies that the additional import capacity into Victoria is equivalent to approximately 20% of Victoria's peak demand, illustrating the scale of the additional support that stronger interconnection could provide during periods of system stress or reduced local generation.

This additional transfer capability is significant. It would improve Victoria's access to renewable generation and firming resources from outside the State, including storage assets and generation that are not subject to the same local weather conditions as Victorian resources. It would also give Victoria greater ability to export renewable electricity when generation conditions are favourable, supporting more efficient use of renewable generation across the wider system. The Project would therefore contribute to a more flexible and resilient network rather than a system that is more dependent on local supply in isolation. Together, these factors explain the strategic basis for the Project location, which connects a major renewable generation region in western Victoria with the NSW network to increase interregional transfer capability.

2.3.3 Coal retirement and replacement supply

The Project is needed not only to connect more renewable generation, but also to maintain system reliability and security as coal-fired generation retires. Consistent with VTP assumptions regarding the retirement of Yallourn in 2028 and Loy Yang A in 2035, the Project would improve access to firmed renewable generation and long-duration storage across the NEM at a time when that additional capability is increasingly needed. The Project would also enable greater imports of renewable energy and firming capacity from NSW and South Australia, including Snowy 2.0 and other storage assets, reducing exposure to supply shortfalls, higher volatility and costly "just in time" replacement of coal-fired generation.

The Project contributes to Victoria's emissions-reduction targets in two key ways: by enabling maximum renewable dispatch and by supporting coal retirements on schedule. With the Project in place, Victoria would be better placed to move away from coal, with the resulting supply gap able to be met through renewable imports and new variable renewable energy capacity.

Accordingly, the Project's role in the transition is not limited to facilitating renewable development. It also includes supporting a more orderly and secure transition away from ageing coal-fired generation by strengthening the network capability needed to integrate replacement supply.

2.3.4 Reliability, resilience and transmission as enabling infrastructure

The Project is also needed because the future electricity system requires greater resilience, more efficient network development and coordinated investment in generation, storage and transmission infrastructure.

As renewable energy becomes the dominant source of supply, resilience increasingly depends on a system that can draw on geographically dispersed resources under a range of operating conditions. These conditions could include periods of low renewable output in one part of the NEM, generator outages and increasing exposure to extreme weather and climate impacts. The Project is expected to improve system resilience and reduce market volatility by adding a new, geographically distinct flow path between Victoria and NSW, in addition to the existing interstate transfer paths.

This network diversity also has market and consumer implications. As discussed in *Technical Appendix O: Business and economics*, by giving the market access to a wider range of supply options across regions, stronger interconnection can help reduce exposure to wholesale price volatility during periods of high demand, low renewable output, outages or network constraints. In practical terms, this can reduce reliance on more costly short-term responses and support more efficient market outcomes for consumers.

New renewable generation cannot deliver its full system benefit unless the network can connect and dispatch it. Similarly, storage and firming resources cannot fully support reliability unless the network can transfer electricity between regions and load centres efficiently under a range of operating conditions. Where transmission development lags behind generation development, the result may be increasing congestion, higher curtailment, less efficient use of renewable resources and greater pressure for additional local investment to compensate for network constraints.

In this respect, transmission infrastructure is enabling infrastructure. It does not replace the need for new generation or storage, but it is essential to their effective operation within the future electricity system. By adding a new high-capacity interregional link, the Project would strengthen the ability of the system to manage changes in supply and demand, improve access to generation and firming resources across the NEM, and support more efficient use of existing and future network investments. The Project is therefore both a response to current network limitations and an enabling investment for the future development of the electricity system.

2.3.5 Timing and the significance of timely delivery

The timing of the Project is an important part of the Project rationale.

Additional transfer capability is required during a period in which Victoria's renewable electricity targets are tightening and major coal-fired generators are scheduled to retire. *Technical Appendix O: Business and economics* assumes energisation of the Project by the end of 2030 and full operational capacity from the end of 2031 following interregional testing, consistent with the 2026 ISP.

Technical Appendix O identifies that the timing of this capability is important because the Project's benefits are linked to when additional transfer capacity becomes available. Timely delivery would allow the market, reliability and resilience benefits described above to be realised during the period in which Victoria is expected to need greater access to renewable generation, firming resources and storage across the NEM.

Delay would defer these benefits. During that period, existing network constraints would remain for longer, renewable generation may be used less efficiently, and Victoria may have greater reliance on other system resources to maintain reliability. These could include additional in-state generation, including gas-fired or other dispatchable generation, additional storage, demand response or network investment. Where replacement supply relies more heavily on fossil-fuel-based generation, this could also slow the reduction in electricity sector emissions. *Technical Appendix O* also notes that analysis of potential delay to VNI West indicates that a seven-year delay could increase residential customer bills and materially increase electricity costs for some business customers, even after accounting for the temporary saving from deferred transmission charges.

For these reasons, the Project's timing is not only a delivery matter. It is part of the Project rationale. Timely delivery would help ensure that additional transfer capability is available during the period in which the electricity system is expected to need stronger interconnection to support renewable integration, maintain reliability and manage the progressive retirement of coal-fired generation.

2.4 Broader benefits and public value

In addition to its core network function, the Project is expected to deliver broader public value. By increasing transfer capacity and supporting more efficient connection and dispatch of renewable generation, the Project is intended to contribute to a more resilient and efficient electricity system. *Technical Appendix O: Business and economics* and the corresponding EES chapter identify cumulative market benefits exceeding \$4 billion in present value terms, reflecting avoided or deferred generation and storage investment and fuel cost savings. They also identify broader benefits that are not readily quantified, including stronger resilience, affordability and sustainability of Victoria's electricity system.

The Project is also expected to contribute to economic activity in Victoria, particularly during construction. *Technical Appendix O: Business and economics* estimates a total economic impact of up to \$2.9 billion in gross domestic product (GDP) to Australia over the modelling period, with around \$1.3 billion accruing in Victoria during construction, and an average annual increase of up to 700 full-time equivalent jobs during the construction phase. These broader benefits would not necessarily be distributed evenly across all host municipalities or communities, and the extent to which benefits are retained locally would depend on procurement outcomes, workforce arrangements and the location of service providers.

Emissions reduction outcomes are also expected to be supported. *Technical Appendix O: Business and economics* estimates that, following energisation, the Project would contribute to avoiding approximately 10.98 million tonnes of CO₂-e emissions in Victoria over the modelled period and reduce fossil-fuel-based electricity generation by around 18,000 GWh (gigawatt-hours). In that respect, the Project would not itself generate renewable electricity but would support the broader system conditions needed for renewable energy to displace more emissions-intensive generation over time.

More broadly, the Project is expected to support confidence in the development of renewable generation in western Victoria and connected regions by improving the network conditions needed to connect and dispatch new generation. This is relevant to the orderly development of REZs and to the efficient use of Victoria's renewable energy resources over time. The Project may also contribute to broader community outcomes through its investment in initiatives intended to support social, economic and environmental uplift for affected communities.

2.5 Implications if the Project does not proceed

If the Project does not proceed, the network limitations and transition challenges it is intended to address would remain and are likely to become more pronounced over time.

Victoria would have less ability to access renewable generation and supporting resources from outside the state, and less ability to export renewable electricity when generation conditions are favourable. According to AEMO¹, Yallourn Power Station has around 1.5 GW of capacity and is expected to retire in mid-2028, as part of the broader withdrawal of conventional generation across the NEM.

¹ AEMO, 2024 Electricity Statement of Opportunities, lists "Yallourn W Power Station (1,450 MW) in Victoria in 2028."

Without the additional transfer capability the Project would provide, Victoria would be more vulnerable to tighter electricity supply. This risk would be greatest during periods of high demand, low renewable output or planned and unplanned outages, or constraints elsewhere in the network. At a consumer level, this could increase exposure to wholesale price volatility and reliability risks, including a greater likelihood that emergency market interventions, demand response or other short-term measures may be required to maintain supply.

It could also place greater pressure on existing generation and network infrastructure during the transition period, particularly if replacement generation, storage or supporting network investment is not delivered in time.

Without the additional transmission capacity provided by the Project, renewable generation in western Victoria and connected regions would be used less efficiently. Network constraints would continue to limit the transfer of renewable generation from these areas, including through increased curtailment. In practical terms, this means that the system may require additional generation, storage or supporting network investment elsewhere in Victoria or across the NEM to deliver an equivalent level of reliability and renewable electricity supply. The result would be a less efficient and potentially more costly transition, with increased risk that replacement supply and network capacity are not available when needed.

There would also be broader emissions consequences if the renewable energy transition is delayed or constrained. The Project does not itself generate renewable electricity, but it is enabling infrastructure that supports the connection, transfer and efficient use of renewable generation. If enabling transmission infrastructure is not developed in time, Victoria may have reduced ability to meet its renewable electricity and emissions reduction commitments. The electricity system may need to rely for longer on higher-emissions generation, or require alternative generation, storage or network investment that is less efficient or more costly to deliver. This could slow the reduction in electricity sector emissions and make the transition to a lower-emissions electricity system more difficult and expensive.

Without the Project, Victoria may need substantially more in-state generation and storage to maintain reliability, increasing the overall cost of the transition. VTP sensitivity testing illustrates the scale of that effect in a more constrained interconnector environment, indicating a potential need for around 8 GW of additional solar, 1 GW of long-duration storage and 0.8 GW of utility storage, with indicative capital costs exceeding \$20 billion in today's terms. In this context, the issue is not that additional generation would necessarily be built in the same already constrained locations, but that the system may require more

in-state generation and storage investment overall to maintain reliability in the absence of stronger interconnection. In addition, a greater requirement for in-state generation and storage may intensify land use pressures in renewable energy zones and other regional areas, with related social, environmental and land use implications for host communities. While that testing is not attributable solely to the Project, it demonstrates the broader importance of stronger interconnection in limiting replacement investment.

The timely retirement of coal-fired generation depends on the availability of replacement supply and sufficient network capability to deliver it. If the Project does not proceed, the transition away from coal-fired generation would be more constrained and potentially more costly. This could increase pressure to retain existing dispatchable generation for longer or increase reliance on short-term measures to manage reliability and supply risks. In that context, the Project would provide a reliability and supply benefit that supports coal-fired generation retirement without relying on extending current retirement timeframes.

Finally, the wider economic and emissions reduction benefits associated with the Project would not be realised. *Technical Appendix O: Business and economics* estimates that the Project would deliver substantial cumulative market benefits, support employment and economic activity during construction, and help achieve reduced emissions from Victoria's electricity sector over the operational period. While these benefits are not the sole basis for the Project, they reinforce the wider public value of the investment.

If the Project does not proceed, some localised project impacts within the Project area would also not occur; however, the broader network, reliability, cost and transition constraints the Project is intended to address would remain.

2.6 Conclusion

VNI West is proposed because the future electricity system requires stronger interregional transmission connections, greater capacity to integrate renewable generation, and a more resilient network to support the retirement of coal-fired generation. The Project responds to those needs by providing a new high-capacity transmission link between western Victoria and NSW, facilitating transfer of renewable power generated in REZs, reducing network constraints and supporting the reliability and security of supply during the energy transition.

The Project is consistent with the strategic and policy framework for the future development of Victoria's and the NEM's electricity systems, including broader national and international climate and energy transition commitments, Victoria's renewable electricity and emissions reduction commitments, and strategic planning for transmission development. Its proposed location reflects the network function it is intended to perform, while detailed consideration of alternatives and project development is addressed elsewhere in the EES. If the Project does not proceed, the system constraints, curtailment risks and transition challenges would remain, with implications for reliability, efficiency and the amount of additional generation, storage and network investment that may be required over time. Timely delivery is a crucial part of that rationale, given the need to support renewable integration and system reliability during the period when Victoria realises its renewable electricity and emissions reduction targets and major coal-fired generators retire. In that context, the Project is proposed because of its broader public value and strategic importance to Victoria and the NEM, including its role in enabling renewable integration, strengthening interconnection and supporting a secure and reliable electricity supply during the energy transition.

