THE REAL COST OF DELAYING OR CANCELLING VNI WEST

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nexa ADVISORY

Contents

About Nexa Advisory

Nexa is a 'for purpose' advisory firm. Our unwavering focus is accelerating the clean energy transition in a way that provides secure, reliable, and affordable power for consumers of all types.

Nexa Advisory is a team of experienced specialists in the energy market, policy and regulation design, stakeholder engagement, and advocacy. We work with public and private clients including renewable energy developers, investors and climate impact philanthropists to help them get Australia's clean energy transition done.

Nexa Advisory stands at the nexus of the energy sector's complex web of stakeholders. We support and direct their dialogue so as to remove the roadblocks to the transition.

We have a track record in policy creation, advocacy, political risk assessment, and project delivery. We are holistic in our approach and deliver solutions with people in mind, and commercial intent.

Acknowledgments

We would like to acknowledge our partner Endgame Economics for their contributions in providing the detailed analysis, modelling and charts for this project. Endgame Economics is an economics and mathematical consultancy that specialises in the energy sector. Endgame brings expertise in optimisation, quantitative analysis, and critical thinking to bear on complex problems.

VNI West modelling

The modelling for this engagement was based on the 2022 ISP Step Change scenario, with updates for the 2023 Inputs and Assumptions Scenarios Report released by AEMO this year. These updates largely reflect the changes AEMO made for the Draft 2024 ISP. For the most part, the updated optimal development path (ODP) is similar to the previous ISP, resulting in limited impacts to the cost estimate of delayed transmission. With updates to outcomes from the Draft ISP 2024, the overall trend of the results in the report would likely remain consistent over the horizon of the study, however could vary between regions or financial years.

Disclaimer:

The real cost of delaying or cancelling VNI West

New electricity transmission infrastructure is the missing link in Australia's transition to clean energy. Transition is as much about energy security, reliability of supply, and cost of living pressures on Australians, as it is about climate targets.

There is broad recognition in Australia of both the urgent need to replace ageing coal-fired generators and the benefits of clean and low-cost renewable generation.

Australia's coal power stations are now approaching the end of their life span and are unreliable and scheduled for closure, leaving a shortfall in generation.

Wind and solar technologies are now the cheapest forms of generation per unit of energy and can be integrated with storage to provide cost-effective and reliable 'firmed' electricity.

To connect all of the new renewable energy generation, Australia needs to build the equivalent of 25 per cent of today's entire transmission grid, 10,000km, in less than 10 years.

The Victoria to New South Wales Interconnector West (VNI-West) project is a key element of Victoria's energy future, providing additional ongoing energy security for Victorians as key Victorian coal power stations close. Given the public discussion about the project, Nexa Advisory engaged Endgame Economics to better understand its impacts on consumers.

Summary of Key Findings

Several key findings emerged from the research:

1. *VNI West is essential to the reduction of the wholesale cost of electricity and putting downward pressure on Victorian electricity bills.*

   A delay to VNI West beyond the announced delivery date of CY 2028 [1] results in higher bills for consumers. Business customers are impacted the most.

2. *VNI West is critical to energy resilience and security in the eastern states. It ensures that electricity can be shared between states to meet demand.*

   The construction of VNI West plays a critical role in ensuring Victorians have a reliable electricity supply, connecting them to the renewable generation in NSW needed to replace the Yallourn and Loy Yang power stations.

Furthermore, the research found that if VNI West is not built at all, more new renewable generation and the transmission to connect it, will be needed in Victoria than would otherwise be the case. This would cost $5.07bn, and that doesn't include the cost of the transmission lines needed to connect it to the grid.

In addition to the cost, there is a question about whether we could actually build the extra generation and storage, and transmission in time. The rate at which we are currently delivering new renewable generation and firming capacity is insufficient to meet what is required today to transition away from ageing coal power stations and decarbonise our electricity system. If VNI-West is not built at all then the task of adding the generation and intra-regional transmission to replace it may be a challenge that is beyond us.

1 Joint media release: Rewiring the nation to supercharge Victorian renewables | Ministers (dcceew.gov.au)

The Victoria to New South Wales Interconnector West (VNI West)

VNI-West is a new high capacity 500 kilovolt (kV) double circuit overhead transmission line, connecting the Western Renewables Link (WRL) in Victoria to Project EnergyConnect in New South Wales. VNI-West is needed because:

- New clean generation capacity will be required to replace coal-fired power stations as they shutdown.
- After the Yallourn closure in 2028, it will deliver an extra 1,800 megawatts of capacity, from NSW, during peak demand periods.
- The increase in wholesale costs to consumers if it is not built, or it is significantly delayed, is far more than would be saved by not investing in the interconnector.[2]

Currently the VNI West interconnector is due to be delivered in 2028[3,4]. However, there are many issues that could result in significant delays, including:

- The regulatory process to approve investment in new regulated interconnectors is slow and has already taken five years, and the project is not yet confirmed.
- Communities along the proposed route for VNI-West do not welcome the project. The Victorian Government has announced schemes for ensuring communities and landholders are compensated, but push back is still growing.

If these issues are not resolved, it will mean further delays to delivering VNI West, making it very likely that VNI West will not be delivered before 2031, the previously anticipated date.[5] This is well-beyond the closure of Yallourn power station in 2028.

The Victorian problem

Currently, nearly half of all of Victoria's electricity is generated using fossil fuels, and a third of all electricity comes from coal power stations.[6]

These coal power stations in Victoria are ageing and are all due to close within the next decade. Yallourn power station is 50 years old and the oldest of the three. It currently provides 17 per cent of Victoria's electricity. It is due to close in CY2028, with Loy Yang A due to close by CY2030, and Loy Yang B by CY2032.[7]

New renewable generation and storage will need to be built and connected before the 2028 closure to ensure families don't suffer rolling blackouts, and that industry and essential services have secure power supplies.

2 https://nexaadvisory.com.au/site/wp-content/uploads/2022/06/Report-Modelling-Electricity-bill-impact-due-to-transmission-delay_2022-06-07.pdf

3 https://www.transgrid.com.au/media/bx5bt5tt/vni-west-fact-sheet-october2023.pdf

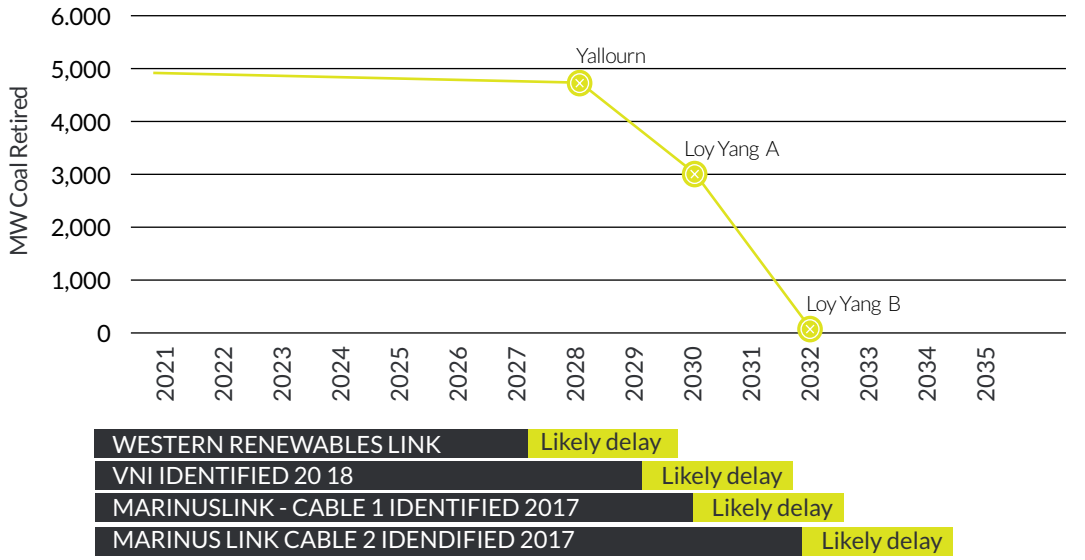
4 https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/transmission-augmentation-information/nem-transmission-augmentation-information-august-2023.xlsx?la=en

5 https://aemo.com.au/-/media/files/major-publications/isp/2022/2022-documents/2022-integrated-system-plan-isp.pdf?la=en

6 https://www.aer.gov.au/industry/registers/charts/registered-capacity-fuel-source-regions

7 https://assets.nationbuilder.com/queenslandconservation/pages/4755/attachments/original/1661909481/Coal-Closure-in-the-2022-ISP-final.pdf?1661909481

Figure 1: Victoria's Energy Challenge — Reliability

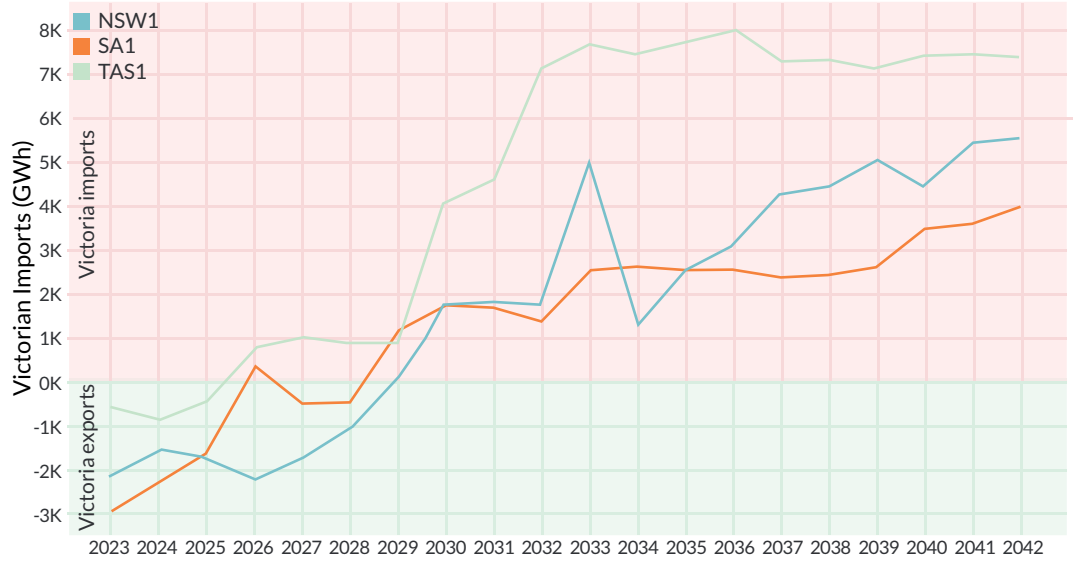


Source: Nexa Advisory forecasts based on AEMO 2022 ISP step change

Victoria's energy future

Victoria is currently a net exporter of electricity, sending approximately 5.5 TWh of electricity to Tasmania, NSW and South Australia per year. Once Yallourn power station is closed in 2028, Victoria becomes a net importer of electricity as seen in Figure 2.[8] This means Victoria will depend on interconnection with other states to ensure there is a reliable supply of electricity to meet peak demand. While the progressive retirement of Victoria's coal fleet increases the dependence on interconnection with other regions for electricity supply, new initiatives, such as the 2 GW of offshore wind to be delivered by 2032 (not included in the modelling) will help to offset any dependence on imports.

Figure 2: Victorian imports and exports of electricity by financial year (negative values mean exports from Victoria, positive numbers, imports into Victoria)



8 https://www.energy.vic.gov.au/renewable-energy/offshore-wind-energy

Residential bills will be higher in Victoria if VNI West is delayed

(See Appendix for modelling assumptions.)

It is unlikely that VNI-West will be delivered by 2028. This is due to continuing delays in progressing the Regulatory Investment Test (RIT-T).

While the dispute registered by local communities was dismissed by the AER[9], communities are still strongly resistant to new transmission in NW Victoria.

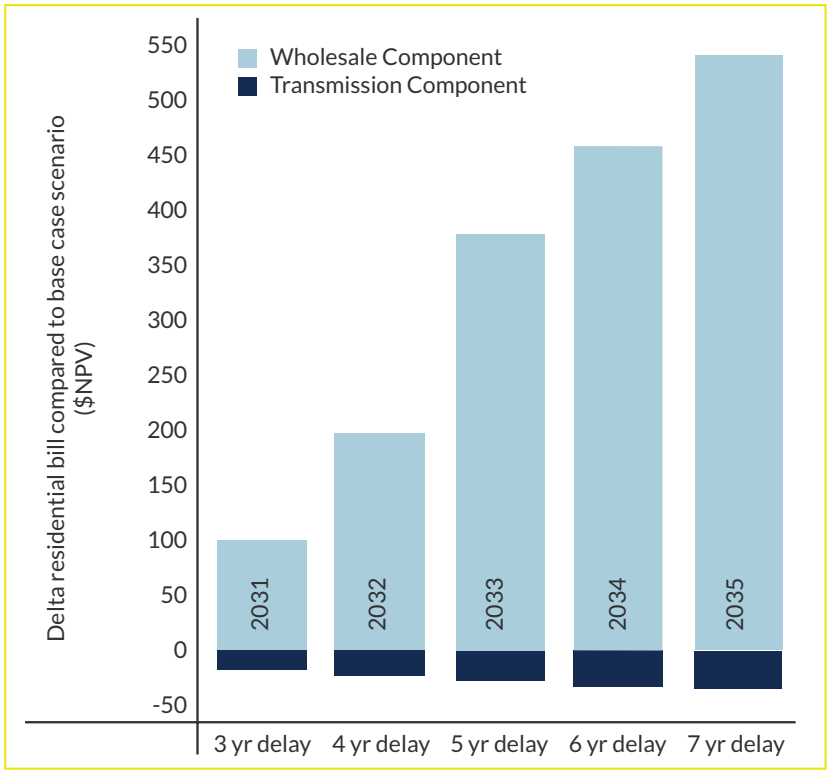
Additionally, both AEMO and Transgrid have yet to fulfill the AER requirement to provide more information before the Project Conclusions Assessment Report (PACR, the final stage of the RIT-T) can be progressed[10]. It is plausible that delivery of VNI West could be delayed by at least three years without additional support, back to the originally anticipated delivery date of 2031[11].

The modelling shows the potential increases in Victorian's electricity bills as a consequence of delays in building the VNI West interconnector. (This would be on top of other electricity bill increases that might occur.)

Electricity bills increase because without the VNI West interconnector, Victorians have supply scarcity and are not able to access sufficient lower cost generation from the northern regions. Delays could see consumer electricity bills increase between $80–$500 (pale blue bars).

The dark blue bars show the 'saving' made by deferring the investment to build VNI-West. It is clear that the savings made from delaying the transmission build are far outweighed by the increased wholesale cost of electricity, which is then passed on to consumers.

Figure 3: Change in residential customer bills if VNI West is delayed by a number of years



9 https://www.aer.gov.au/victoria-nsw-interconnector-west-vni-west-rit-t-dispute

10 https://www.aer.gov.au/publications/reports/compliance/aemo-victoria-planning-and-transgrid-vni-west-pacr

11 https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/victorian_transmission/vni-west-rit-t/reports-and-updates/vni-west-pacr-volume-1.pdf?la=en

Business customers are impacted the most

The electricity bill increases for business customers are even more significant. For a 3-year delay, Victorian electricity business consumer bills will increase by around $695, for businesses that consume a yearly average of 40 MWh, $1,740 for average use of 100 MWh and an increase of $17,340 and $69,500 for business customers that consume an average of 1 GWh and 4 GWh per year respectively.

Table 1: Increases in business customer electricity bills if the VNI West interconnector is delayed (real 2024 AUD)

	VNI-W delivered CY	Annual Energy Consumption			
		40 MWh	100 MWh	1GWh	4 GWh
3-year delay	2031	$695.31	$1,738.28	$17,382.79	$69,531.15
4-year delay	2032	$1,509.36	$3,773.39	$37,733.92	$150,935.66
5-year delay	2033	$3,018.05	$7,545.13	$75,451.25	$301,805.02
6-year delay	2034	$3,665.55	$9,163.87	$91,638.72	$366,554.89
7-year delay	2035	$4,351.94	$10,879.84	$108,798.39	$435,193.54

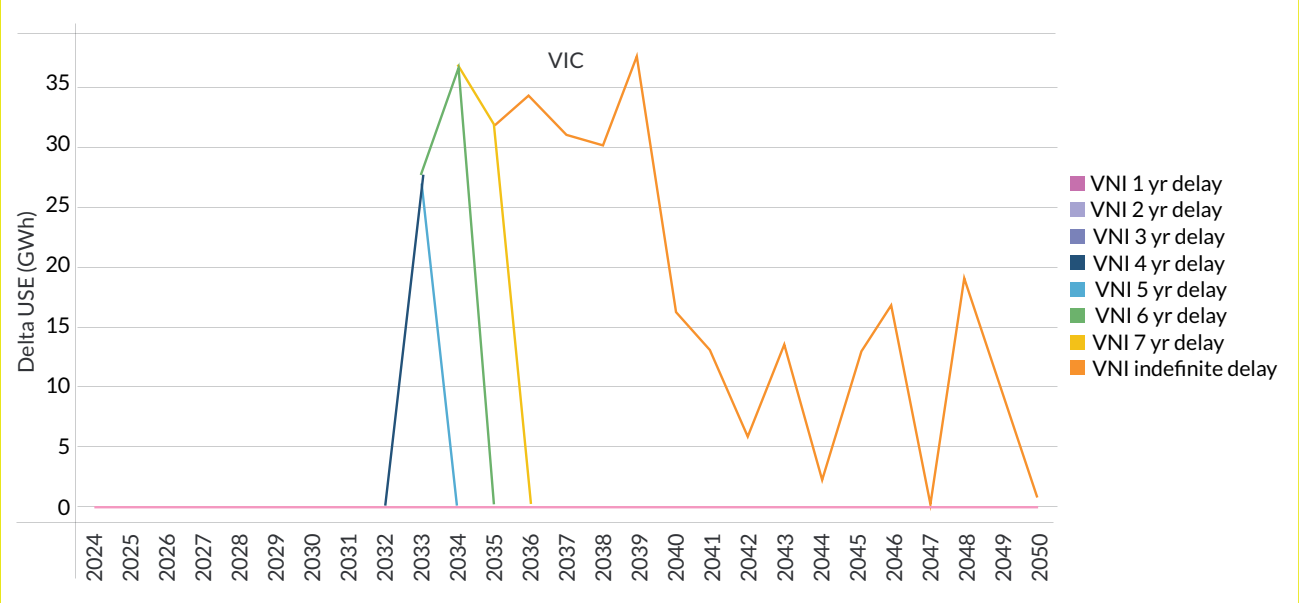
What if we don't build VNI West at all?

The modelling also explored what would happen if VNI West is indefinitely delayed, effectively never building VNI-West.

Victoria's electricity supply will be insecure

Without VNI-West, Victoria will consistently have unserved energy needs after 2032 (the orange line, Figure 4). That is, as the coal units progressively exit the Victorian market there is not enough electricity available in the state to meet demand.

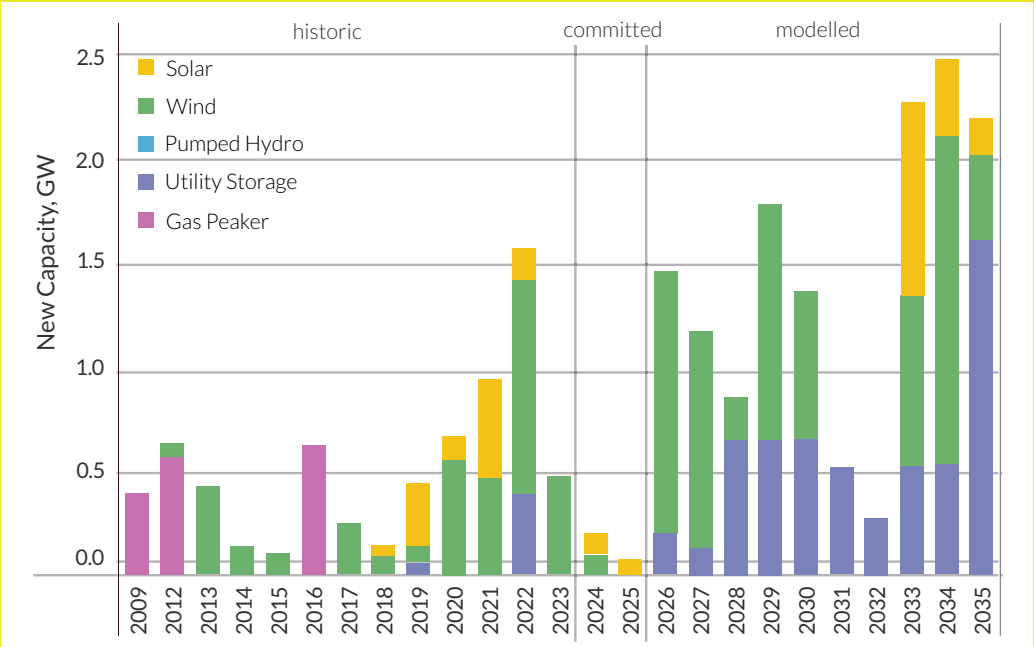
Figure 4: Delta in USE outcomes by FY compared to the base case scenario



More renewable generation, storage and local transmission will be needed to meet demand

Nearly 8 GW of renewable generation and 6 GW of large-scale batteries already need to be built between now and 2035 to replace Victoria's coal-fired power stations as they exit the market.

Figure 5: Generation capacity added in Victoria by financial year: historic, committed and modelled assuming VNI-West is built on time



Note: Modelling included only onshore wind.

If VNI-West is delayed electricity bills will go up for Victorian households and businesses, and there is a risk the lights will go out.

If VNI-West is not built at all, then meeting electricity demand can only be resolved by building a lot more renewable generation in Victoria. The modelled cost of the additional generation and storage capacity that would need to be built in Victoria to replace VNI-West if it is not built is over $5 billion in amortised capital expenditure and fixed costs from FY 2026–2051 (net present value). This $5 billion doesn't include the cost of building the local transmission lines needed to connect all the additional generation to the Victorian system.

Not building VNI West will lead to other negative flow on impacts. It would be a substantial challenge for Victoria to rapidly develop large amounts of new generation and storage. This pace and volume of required new entrant capacity would present further risk to the reliability and affordability of electricity for Victorians if new projects or intraregional transmission are delayed. The impact on wholesale electricity price increases as a result of not building VNI-West and there being an at least temporary shortfall in supply while construction is completed would be on top of the $5bn it would cost to build the new generation, and the cost of its connecting transmission.

Without VNI West, Victoria also loses the 'insurance' value provided the ability to import more electricity from NSW when there are local generation issues in the state, such as adverse weather conditions or unexpected outages.

(Note that this modelled scenario assumes that the MarinusLink cables proceed as planned and the Tasmanian Renewable Energy Target (TRET) is met. Delays to MarinusLink or capacity entering under the TRET would exacerbate this challenge and further threaten reliability and affordability of energy in Victoria.)

Appendix: Modelling Assumptions

Assumption	Source
Existing capacity and anticipated projects	NEM Generation info – July 2023. POE10 for LT capacity expansion planning. POE50 for ST dispatch modelling.
Operational demand sent-out	ESOO 2022 ISP Central Step Change
Transmission augmentations	AEMO 2022 ISP Optimal Development Path (ODP) with recent updates as of Oct 2023.
Coal retirement path	AEMO 2022 ISP Step Change retirement path with updates to Yallourn as per public announcement.
State and federal policies	• QRET (60% renewables by 2030, 70% renewables by 2032, 80% renewables by 2035), • NSW Roadmap (33.6 TWh eligible renewables by 2030, 2 GW long-duration storage by 2030, 930 MW firming tender) • VRET (65% renewables by 2030, 95% renewables by 2035, 2.6 GW storage by 2030, 6.3 GW storage by 2035) • TRET (200% renewables by 2040)
Build Costs	GenCost Global NZE post 2050 as per AEMO 2023 IASR Step Change scenario
Project economic life	AEMO 2023 IASR
Fixed operations & maintenance costs (FO&M)	AEMO 2023 IASR
Variable operations & maintenance costs (VO&M)	AEMO 2023 IASR
Renewable availability traces	AEMO 2023 IASR
New entrant characteristics (including storage round-trip efficiencies, hydro inflows etc)	AEMO 2023 IASR Step Change Scenario
Existing generation characteristics (including marginal loss factors, emissions intensity, ramp rates, minimum stable levels, maintenance rates, average time to repair, seasonal ratings etc)	AEMO 2023 IASR Step Change Scenario
Generator outages	Median outage trace using 2023 IASR generator expected forced outage rates
REZ Build Limits	AEMO 2023 IASR
Snowy 2.0	Operational in December 2029
Weighted average cost of capital (WACC)	7 percent as per the AEMO 2023 IASR

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