Policy Institute Australia

It’s not too late

Getting infrastructure right for the energy boom

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1 Executive Summary

Over the past 20 years, a transport megaproject boom has redrawn our cities. It has reduced travel times, facilitated growth, attracted investment into the civil construction industry and changed the industry itself. It has resulted in massive jobs growth, with the civil construction sector adding 50,000 more jobs over the past two decades than if it had grown at the same rate as the overall labour market.

It has also been very expensive. There are currently more than 50 transport packages valued at more than $1 billion each under construction across Australia. Many of these 'megaprojects' have ended up costing more — sometimes far more — than originally budgeted. The average estimated cost overrun for the 10 largest transport projects along Australia's east coast announced since 2010 has been 100%, an average of over $10 billion per project.

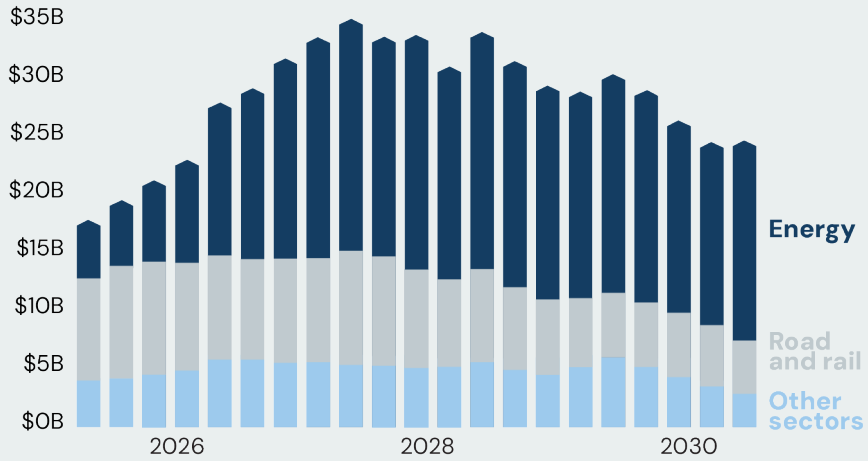
The scale of the transport boom has expanded the civil construction industry. Civil construction output on road and rail projects increased from $21 billion per year in the 2000s to $46 billion per year in the 2020s, with the share of GDP rising from a low of 0.6% in 2003 to a recent peak of 1.4% of GDP in 2024.[1] Along the way, capacity challenges to deliver projects on time and on budget have persisted, particularly with regard to the civil construction labour force.

It is into this capacity constrained market that Australia is gearing up for the next megaprojects boom — in energy. Australia is undergoing an energy transition, driven by the end-of-life closure of coal-fired power generators, as well as by ambitions to reduce Australia's greenhouse gas emissions. To date, renewable energy generation projects have dominated the pipeline. Going forward, much larger transmission projects await.

[1] Policy Institute Australia analysis of ABS data (Australian Bureau of Statistics, 2025b; Australian Bureau of Statistics, 2025a)

Figure 1: Energy dominates the infrastructure pipeline

Modelled infrastructure pipeline, quarterly, by sector



Note: Other sectors include water and sewerage, social and other projects.
Source: Infrastructure Partnerships Australia (2025a)

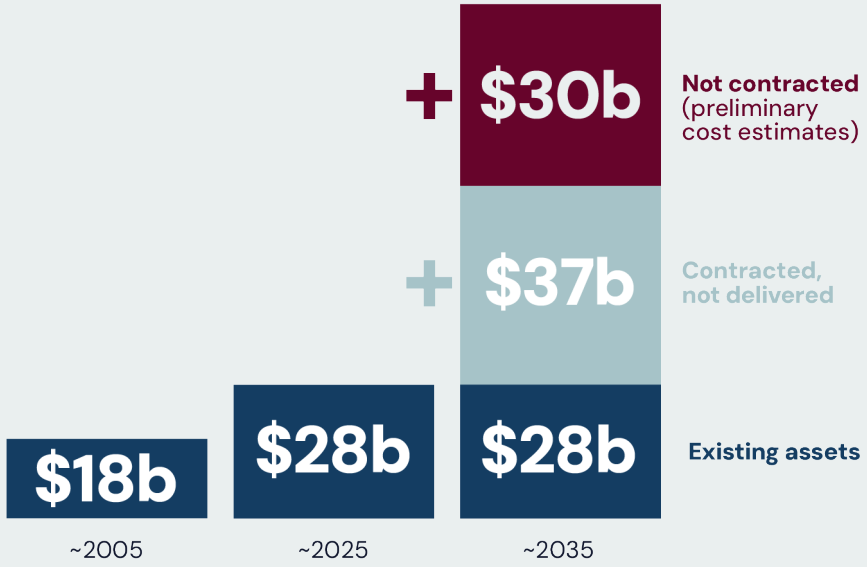
Major transmission projects — which enable the expansion of the electricity grid — dominate the pipeline of energy megaprojects. Given their size and dominance, transmission projects are the focus of this paper. Expansion of the grid is needed to connect new renewable generation to consumers as old coal-fired generation is phased out.

The investment is huge. Current plans target a 15% increase in the length of the transmission grid, at an estimated cost of at least $65–$85 billion in capital expenditure along Australia's National Electricity Market (NEM). Cost estimates will almost certainly rise given abundant evidence of exceedingly low initial costings on projects that have been contracted so far. Even at current estimates, this value would more than triple the total value of the current transmission regulatory asset base (RAB) in the NEM, with most investment in New South Wales, Queensland and Victoria (Figure 2).

The risk of energy megaproject cost overruns is a matter of grave concern. Across the NEM, the grid is owned and run by monopoly transmission network service providers (TNSPs) who pass their investment costs on to consumers through regulated electricity network charges. This is quite different to the impact of cost overruns in road and rail, where most public investment is absorbed into government balance sheets.

Figure 2: The estimated value of planned transmission projects is much larger than the current value of the existing grid

Estimated value of transmission RAB, NEM, $ billion, constant 2025



Note: Historical RAB points for ElectraNet (2003), TasNetworks (2003), Transgrid (2004), Energy Australia (2004), Powerlink (2007) and AusNet (2003) are adjusted to constant $2025 dollars. Current projects reflect Policy Institute Australia analysis of potential value of the RAB, once current projects are completed. Note this analysis does not consider the impact of concessionary finance or government grants. See Appendix A for more detail on the methodology.
Source: Australian Energy Regulator (2007); Australian Energy Regulator (2025e)

For decades, the well-established NEM required relatively little investment, leaving transmission charges at only around 9% of retail electricity bills.

Going forward, however, as capital costs rise and are recouped through an approved RAB, consumers' bill for transmission will also rise. Policy Institute Australia estimates that the $65–$85 billion in forecast transmission capital expenditure could cost an east-coast Australian household up to an extra $600 each year, on average, once these projects enter the RAB. That's equal to an increase in household energy bills of about 25%.

The magnitude of the increase would vary by household usage, but the increase in charge may be disproportionately borne by lower income households. For example, for a typical NSW household, a 20% increase in annual electricity costs is equivalent to 0.5% of income for a middle income household, but 1.3% of income for a lower income household.

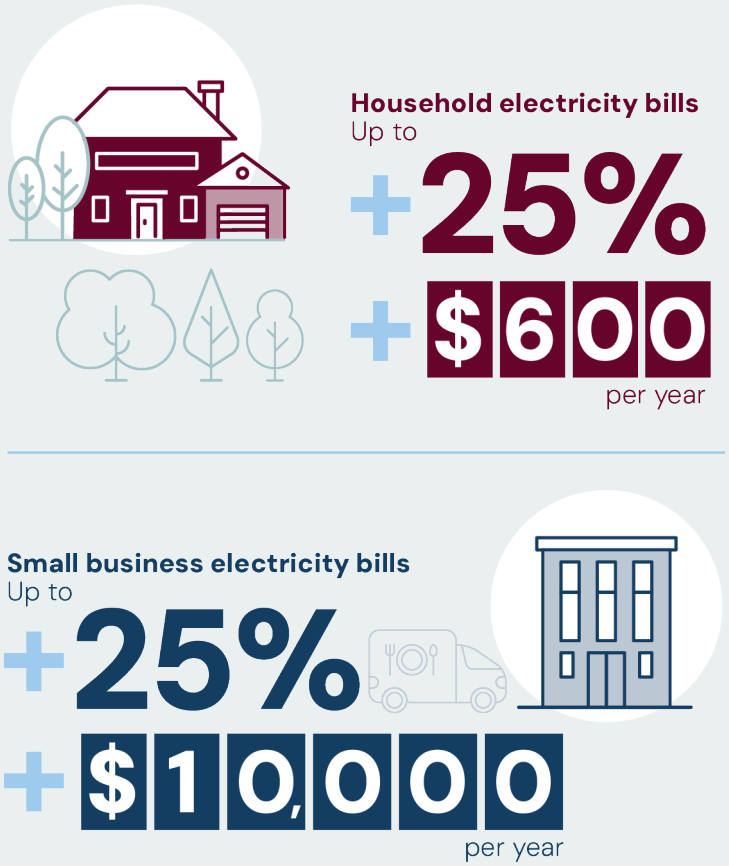
Policy Institute Australia estimates that a typical small business would also see an increase in their energy bills of about 25%. For a small business with an annual consumption of up to 100,000 kWh per year, this would add around $10,000 in annual electricity costs.

Costs could rise more if poor delivery sees even more cost escalation. At worst, lengthy project delays or failures could lead to grid instability and blackouts, at a much greater cost.

The good news is that it is early days in the transmission build. It's not too late to intervene with reforms to contain costs and deliver our future energy system with clarity and certainty.

Figure 3: Consumers will bear the brunt of network investment

Estimated impact of transmission capital expenditure on households and businesses



Note: Estimates are indicative only. Household electricity bills estimate how additional transmission spending that enters the RAB will be paid for on a per household basis. Small business electricity bills reflect a business consuming up to 100,000 kWh of electricity per year. The estimates do not include any second round impacts, such as potential falls in wholesale electricity costs. See Appendix A for more detail on the methodology.

Source: Australian Energy Regulator (2025e); The Australia Institute (2018); Australian Energy Market Commission (2025b); Australian Energy Regulator (2025b)

To illuminate the path forward, this paper examines the experience of the major transport boom and applies it to the energy sector in a "lessons learned" approach. Though transport and energy are very different sectors, the mistakes made in transport are typical of megaprojects generally, and if applied can help deliver a more affordable renewable energy future.

Cost drivers identified in the transport boom include weak front-end planning, poor scoping often resulting from politically-driven announcements, immature procurement and contracting approaches, limited contestability for some projects, poor recognition or management of capacity constraints, and issues in industrial relations. A rapid ramp up of the pipeline, its scale and ambition for "first of its kind" projects were also factors. The causes of cost overruns in transport megaprojects have been structural, not incidental. They reflected incentives, institutions and market settings that were insufficient to drive disciplined investment or credible delivery.

At this early stage of the energy boom, warning lights are flashing bright that the mistakes of the transport past may be repeated in our energy future. The total expected cost of transmission investment has nearly tripled, in real terms, from $30 billion to $65–$85 billion.[2] Costs are likely to escalate further, as many identified transmission projects are yet to be fully scoped and have a large margin of error around their cost estimates — with a high risk of future upward cost revisions as well as cost overruns.

In this paper, Policy Institute Australia sets out a pathway to improve our ability to deliver an affordable transmission transition.

First, we look at the experience of Australia's transport boom, the track record of delivery and the market conditions that have resulted. We then review Australia's energy transition, the role of transmission and the pipeline of energy megaprojects. Finally, we apply lessons learned in transport to energy, and provide recommendations for reform across three areas: planning and scoping, procurement and contracting, and capacity management.

Our reform direction is practicable, grounded in the principles of competition and contestability, and aims to limit cost overruns on major project delivery. The issues we identify largely result from a need for our institutional and governance arrangements to evolve along with the changing nature of our energy system; like the energy system itself, our governance arrangements need to transition to suit a renewable energy future.

Australia has done difficult infrastructure tasks before. The country expanded road and rail networks at pace, under tight labour markets and complex planning environments. The lesson from that experience is that well-designed institutions, credible planning and competitive markets matter. The transmission build can draw on those lessons. If governments apply them consistently, the energy transition can be delivered more efficiently and at lower cost. If not, consumers will face higher bills, slower decarbonisation and greater risk to system reliability. And a more dynamic, competitive and affordable approach would benefit not just the energy transition but all the other areas of the economy that are enabled by essential infrastructure and the industry that delivers it.

[2] This compares initial project cost estimates to the latest cost estimates. Refer to Appendix A for more detail.

2 Recommendations

This paper advocates for reforms to get ahead of the challenges of Australia's transmission transition. It offers a practical agenda for state and Commonwealth governments to better manage the next major infrastructure cycle with smarter incentives, tighter discipline and better long-term value for the public. It's not too late.

This paper was produced with a mixed methods approach, combining desktop research and data analysis with extensive consultation including more than 50 experts in the energy sector, construction sector, government and academia. We are grateful to them for their generous contribution of time and deep insights to this project.

Reform area 1: Clearer, more strategic planning in transmission

Accountability and responsibility for planning the east coast energy grid, or the NEM, currently sits across the Australian Energy Market Operator (AEMO) as the national market operator, state government planning authorities and TNSPs as asset owners that are both privately and publicly owned.

TNSPs have historically played a planning role in some jurisdictions for maintenance and upgrades, but are not accountable to act in the public interest from a network planning perspective. AEMO's role as system planner is constrained as policy decisions such as carbon reduction are assumed in its key public document, the Integrated System Plan (ISP), and desktop scoping for the ISP does not provide sufficient depth on costing to account for land access issues. Meanwhile, states are closest to the planning action and hold planning authority for every other major infrastructure sector, but may in some cases lack the technical expertise of AEMO or the TNSPs.

The result is a muddle within the transmission planning space between asset owners, system planners and state agencies, including accountability and responsibility for the land access issues that have been a major driver of delays and cost estimate errors to date.

Recommendation 1: AEMO should no longer be the National Transmission Planner, and should no longer have the power to designate projects as "Actionable". Instead AEMO should play a coordinating role as National Transmission Coordinator, including ensuring NEM system stability and avoiding unnecessary duplication in transmission infrastructure. AEMO should also provide advice to the states on the development of any interconnectors between jurisdictions, to ensure efficient investment decisions.

Recommendation 2: State governments should be responsible for the strategic planning of all major transmission infrastructure. States should be responsible for all decisions to proceed with specific transmission investments, to be made following detailed business case assessments.

Recommendation 3: Major transmission planning functions that sit with a TNSP should be removed and transferred to a state government entity that is independent of asset ownership.

Recommendation 4: AEMO's Integrated System Plan (ISP) should be repositioned as a technical projection of alternative future grid pathways to inform state and Commonwealth decision making. The ISP should incorporate whole of system modelling and not be constrained by government policy but include multiple scenarios with more flexibility on how scenarios are selected.

Reform area 2: Better value for money through procurement

In building big infrastructure, the procurement stage is a vital determinant of cost. It is where competition and contestability in the market can be leveraged to contain costs and deliver best value for money in major projects.

As the major transport project boom has unfolded, procurement teams learned early lessons and have matured to become more sophisticated buyers. Some teams have consolidated around a centre of excellence, and their toolkit has evolved toward more bespoke procurement methodologies and programmatic work approaches that are more able to harness competitive forces and identify efficiencies.

Recommendation 5: Governments should deploy contestability for all major public infrastructure projects, with no automatic preference given to incumbent asset owners or first movers. This includes major transmission projects.

Recommendation 6: Each state with a significant infrastructure pipeline should create an *Infrastructure Delivery Agency* with experienced, sophisticated procurement professionals to lead major project procurement across transport, energy and social infrastructure. This could be a single agency, or a hub of multiple delivery agencies.

Recommendation 7: The *Infrastructure Delivery Agency* would lead on all matters of community engagement, land access and land acquisition on all major infrastructure projects.

Reform area 3: Better pipeline and capacity management

Capacity constraints have played a clear role in cost escalation and overruns in major transport projects, with workforce shortages key among these. Managing our national infrastructure pipeline to the capacity that exists to deliver it will help manage the costs of the pipeline overall, and of each project within it.

Across most sectors, states and territories are primarily responsible for selecting and delivering major public infrastructure projects — and are best placed

to manage the infrastructure pipeline in the context of capacity constraints. But their visibility of nationwide capacity is low, and their responsibilities and accountability for managing the energy infrastructure pipeline are unclear.

At the Commonwealth level, Infrastructure Australia plays an important role as the Commonwealth's independent adviser on major infrastructure, including investment planning and project prioritisation. But currently it has little involvement in evaluating major energy infrastructure projects.

Finally, workforce capacity constraints continue. The decline in labour force productivity in the construction industry over the past 10–15 years indicates Australians may be paying more, and getting less.[3] Industrial relations is one piece of this puzzle. Recommendations for industrial relations reforms are outside the scope of this paper, but better data will help inform a way forward, including interventions to create more workforce capacity.

Recommendation 8: State transmission planning entities should undertake scheduled, formal reviews of their transmission pipeline to reassess project scope, timing and sequencing. All NEM states undertake cost benefit analysis of all major transmission projects over the next 12–24 months to determine if projects remain justified.

Recommendation 9: Infrastructure Australia's remit should be expanded to evaluation of major energy infrastructure project business cases. Infrastructure Australia should assess business cases for any major infrastructure project that receives a Commonwealth investment of $250 million or more, whether provided through grant, debt, equity, or another funding mechanism. To enable this, the Commonwealth should revise Infrastructure Australia's Statement of Expectations and, where necessary, secure agreement from state and territory Energy Ministers.

Recommendation 10: Expand the role of Infrastructure Australia to gather and publish labour productivity metrics across all publicly funded major infrastructure projects consistent with their work on the Infrastructure Market Capacity Report.

[3] The Australia Institute (2014), Productivity Commission (2025)

3 Australia's infrastructure boom

3.1 Energy boom facing a heated construction market

Provision of public infrastructure is central to our nation's wellbeing. Australia's emerging boom in energy infrastructure is nascent, but is unfolding in an environment heavily influenced by the big transport boom of the past two decades. Learning the lessons of the transport boom would help to ensure value-for-money in the energy transition.

Australia's boom in major transport projects started around two decades ago. After years of low investment, accelerating population growth and recognised capacity constraints, the early 2000s saw consensus grow in favour of renewed investment in public infrastructure. The desire to stimulate growth with "productivity-enhancing" expenditure after the Global Financial Crisis of the late 2000s bolstered arguments in favour of an expanded major public works program in many parts of the nation.[4]

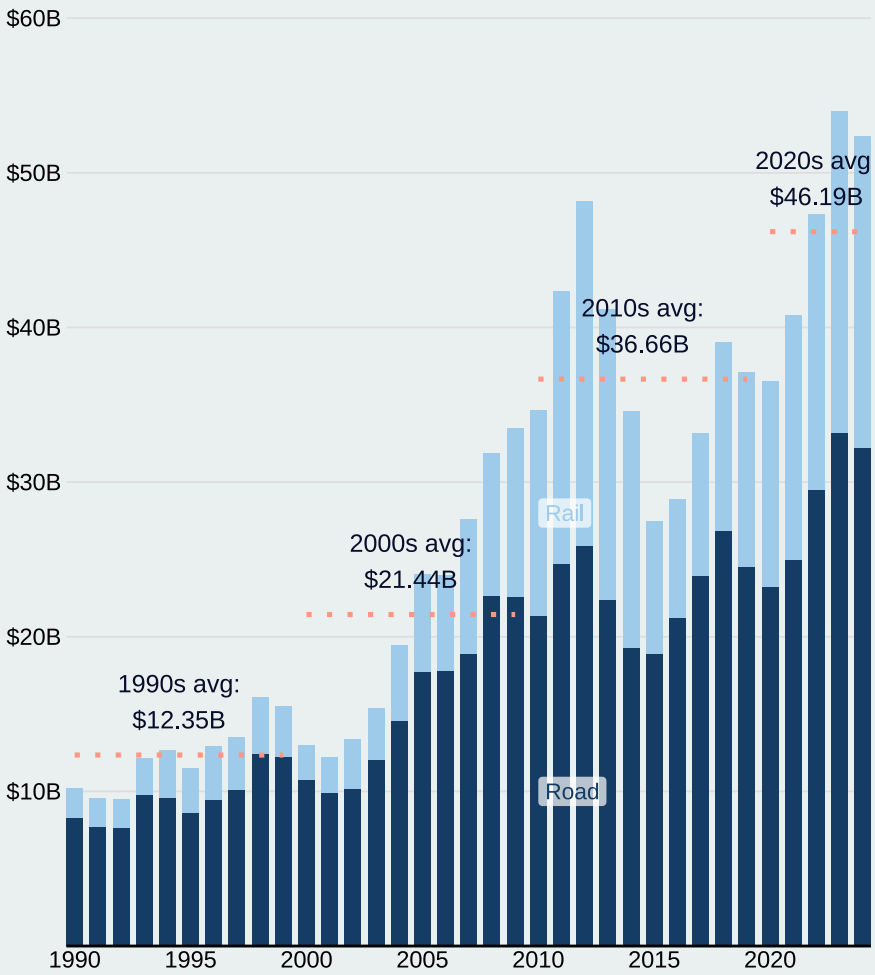
The result was an explosion of public investment in transport infrastructure. Civil construction activity on road and rail projects increased from $21 billion per year in the 2000s to $46 billion per year in the 2020s, with the share of GDP rising from a low of 0.6% in 2003 to a recent peak of 1.4% of GDP in 2024 (Figure 4).[5]

[4] Engineers Australia (2010)

[5] Policy Institute Australia analysis of ABS data (Australian Bureau of Statistics, 2025b; Australian Bureau of Statistics, 2025a)

Figure 4: Transport infrastructure has boomed

Civil construction, work done, $ billion (constant 2024 dollars), Australia



Note: Rail includes bridges, railways and harbours. Road includes roads, highways, and subdivisions. All data adjusted to 2024 dollars using CPI.

Source: Australian Bureau of Statistics (2025d)

3.2 Megaprojects have driven mega growth

Part of what drove the increased spend in public transport was the introduction of more ambitious transport projects that were larger, more complex and more expensive to deliver. The era of 'megaprojects', defined as projects costing more than $1 billion, began.

In the 1990s and early 2000s, there were few projects that reached the $1 billion mark. In 1998, Transurban's City Link toll road in Melbourne — 22 kilometres of bypass around Melbourne's CBD and connections to three existing freeways — was slated to cost $2.2 billion.[6] At the time, this was touted as the largest road project in the world. Adjusting for inflation, this represents a cost of around $4.5 billion.[7]

Today, projects of this size are common. There are currently over 50 transport packages[8] in Australia over the $1 billion mark.[9] Nearly 10 of these are worth more than $5 billion.[10] In Queensland, where the movement to ever-larger projects continues to accelerate, the number of infrastructure projects valued between $500 million–$1 billion has roughly doubled since COVID, and the number of $1 billion projects has *more than* doubled.[11]

Project complexity has played a role in the growth of megaprojects, particularly urban projects requiring expensive tunnelling. The $26 billion North East Link project in Victoria, $27–29 billion Sydney Metro in NSW and $19 billion Cross River Rail project in Queensland are among three of the largest.[12]

3.3 25% of construction is now driven by public demand

The growth in major project demand has had a lasting impact on the construction industry.

Construction is Australia's sixth largest industry, contributing over 7% of GDP (Figure 6). It is our third largest employer, providing jobs for more than 1.3 million Australians. The construction sector enables activity across the Australian economy, including for our mining and housing sectors.

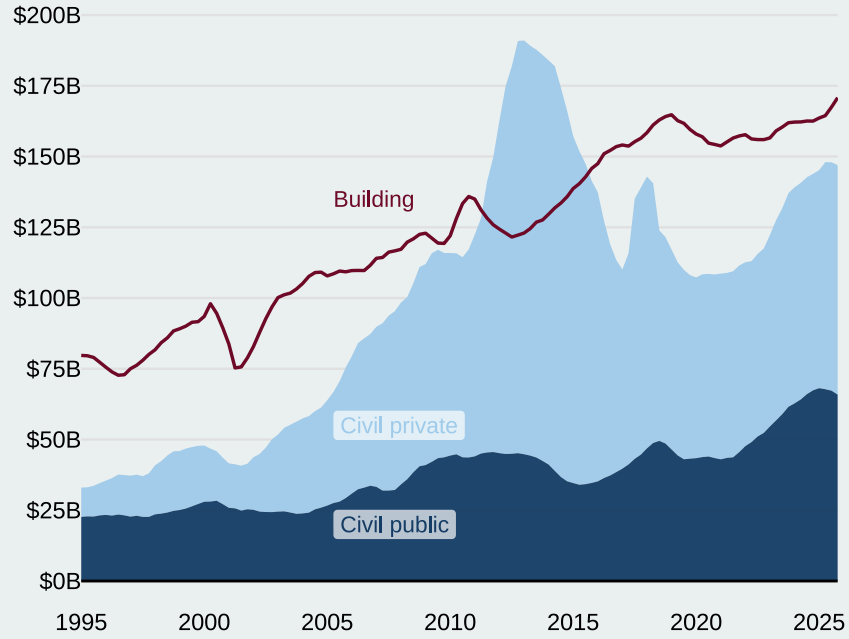
Rising government investment in infrastructure has changed the construction industry itself. Growth in civil construction[13] has outpaced that of residential and non-residential building construction (Figure 5), and has been so strong for so long that civil construction's share of total construction output has risen from 30% in 2000 to a peak of over 60% in 2012, and sits at around 45% today.[14]

Within the civil construction sector, the public sector accounts for around half of total civil construction output. This means government demand, investment decisions and procurement practices now drive 25% of output for the construction industry as a whole.[15]

[6] Australian Financial Review (1998)
[7] Policy Institute Australia analysis using ABS data. (Australian Bureau of Statistics, 2025c)
[8] Individual programs of work contracted out to major construction firms.
[9] Infrastructure Partnerships Australia (2025a)
[10] Infrastructure Partnerships Australia (2025a)
[11] Queensland Major Contractors Association (2024)
[12] Queensland Audit Office (2025); ABC News (2025a); Victorian Auditor-General's Office (2025)
[13] *Civil construction* is the building of roads, bridges, railways, tunnels, dams, electricity networks, pipelines, sports fields, mining sites, and other large-scale infrastructure.
[14] Policy Institute Australia analysis of ABS data. (Australian Bureau of Statistics, 2025b)
[15] Policy Institute Australia analysis of ABS data. (Australian Bureau of Statistics, 2025b)

Figure 5: Civil construction has outpaced building construction

Construction work done, civil and building, $ billion, all states and territories



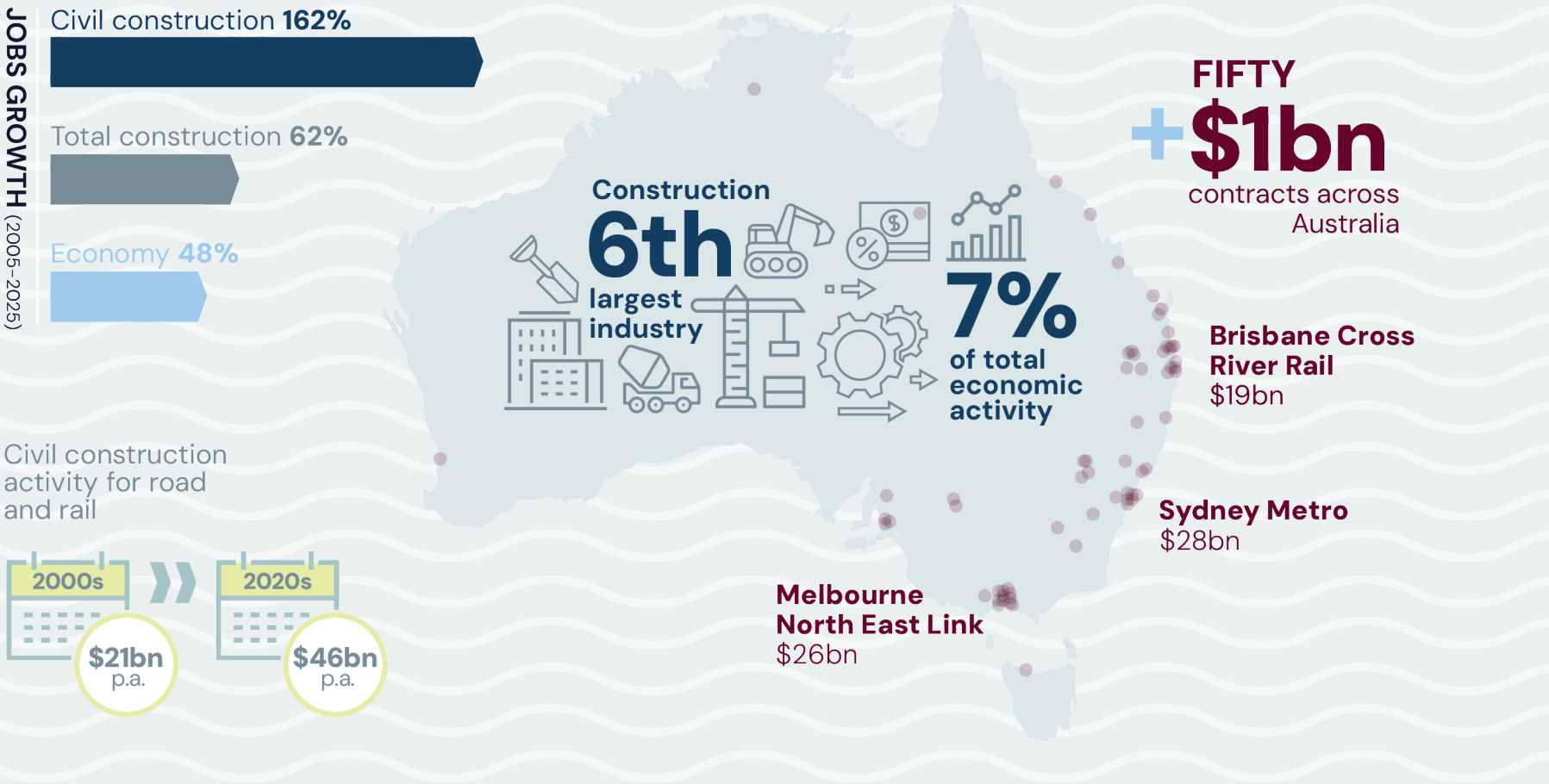
Note: Building construction refers to residential and non-residential. Construction services is not included in this chart, but is also a component of the broader construction industry.
Source: Australian Bureau of Statistics (2025b)

The labour force has responded to this rising demand in construction, with the construction workforce expanding at a much faster pace than the overall labour force. Since 2005, the workforce in heavy and civil engineering construction has increased by around 160%, far exceeding the overall construction sector (60%) and the broader economy (48%).

And yet, capacity constraints persist. A report by the New South Wales Productivity and Equality Commission found another 96,000 workers would be needed to meet the government's infrastructure pipeline.[16] In Queensland, Infrastructure Partnerships Australia projects labour demand will double over the next two years, partly due to the ramping up of construction for the 2032 Brisbane Olympics.[17] To meet this would require Queensland to find close to 40,000 extra civil construction workers — growth that cannot plausibly be achieved.[18]

[16] NSW Productivity and Equality Commission (2024)
[17] Infrastructure Partnerships Australia (2026)
[18] Policy Institute Australia analysis of ABS data. (Australian Bureau of Statistics, 2026b)

Figure 6: Australia's big boom in civil construction



Note: Red dots on map are illustrative of the location of major infrastructure contracts currently awarded across Australia.
Source: Australian Bureau of Statistics (2025a); Australian Bureau of Statistics (2026b); Infrastructure Partnerships Australia (2025a); Australian Bureau of Statistics (2025d)

3.4 Delivery delays and cost overruns are common

While the infrastructure delivered during the boom has shaped the nation, most individual public sector projects have suffered cost overruns and delivery delays, with cost 'blowouts' on some of the most high profile projects.[19]

Major project timelines can often run late. Infrastructure Australia data shows that transport projects are typically delayed by 7–33% compared to original plans.[20] And delayed projects tend to blow budgets. Infrastructure Australia data suggests the average cost increase on transport infrastructure projects is 12–52%.[21]

For megaprojects, cost overruns are often much bigger. Policy Institute Australia analysis suggests that the average estimated cost overrun for the 10 largest transport projects announced since 2010 along Australia's eastern seaboard has been 100%, or over $10 billion per project (Figure 7).

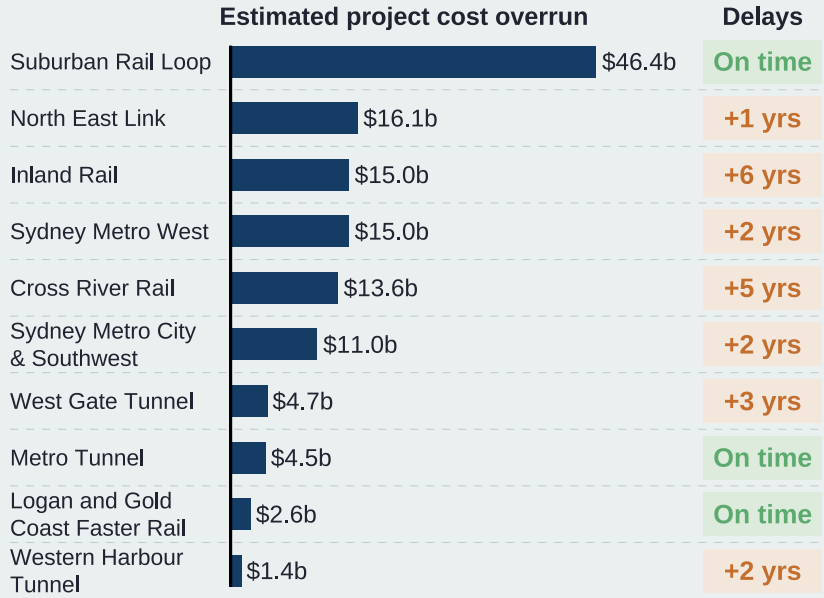
[19] The terminology used for cost escalations, cost overruns and cost blowouts are often conflated. In this paper, *cost escalation* refers to an anticipated or actual rise in the cost of key inputs over time, such as labour and materials. It is often a normal (and budgeted) part of major infrastructure projects. *Cost overruns* refer to a difference between the budgeted and actual cost of delivering a project. There are many different ways in which this can be measured, which depends on the reference point used and whether data is presented in real or nominal dollars. *Cost blowouts* is a colloquial term for a significant cost overrun, often in the magnitude of costs exceeding 50-100% from a baseline figure.

[20] Infrastructure Australia (2024a)

[21] Infrastructure Australia (2024a)

Figure 7: Australian transport megaprojects are often over budget, and delayed

Estimated cost overruns and delays, ten largest transport infrastructure projects



Note: Projects shown include the ten largest Australian transport infrastructure projects that could be found with publicly available initial cost estimates exceeding $1 billion that were announced from 2010 onwards, with a more recent public cost estimate. Cost overruns are not directly comparable across projects.
Source: Australian Financial Review (2024); ABC News (2025a); Transport for NSW (2023); ABC News (2023); InDaily QLD (2024); The Sydney Morning Herald (2023); Sydney Metro (2024); Major Transport Infrastructure Authority (2025a); Rail Express (2024); The Age (2020); Queensland Productivity Commission (2025); Minister for Transport and Main Roads (2025); Major Transport Infrastructure Authority (2025b); Transport for NSW (2024).

3.5 Cost overruns are a global phenomenon

Overruns of time and cost on major projects are not unique to Australia. The global experience is similar, as evidenced in the work of megaproject guru Professor Bent Flyvbjerg and his database of more than 16,000 megaprojects in 136 countries — the world's largest database of its kind.[22] Flyvbjerg coined the "Iron Law of Megaprojects": over budget, over time, under benefits, over and over again.

Transport projects globally tend to experience cost overruns of 15% for roads and up to 40% for airports, buses and rail due to engineering and construction complexity (Figure 8). In a cautionary tale for Queensland, Olympic Games are on record as suffering the largest average cost blowouts at 157%.

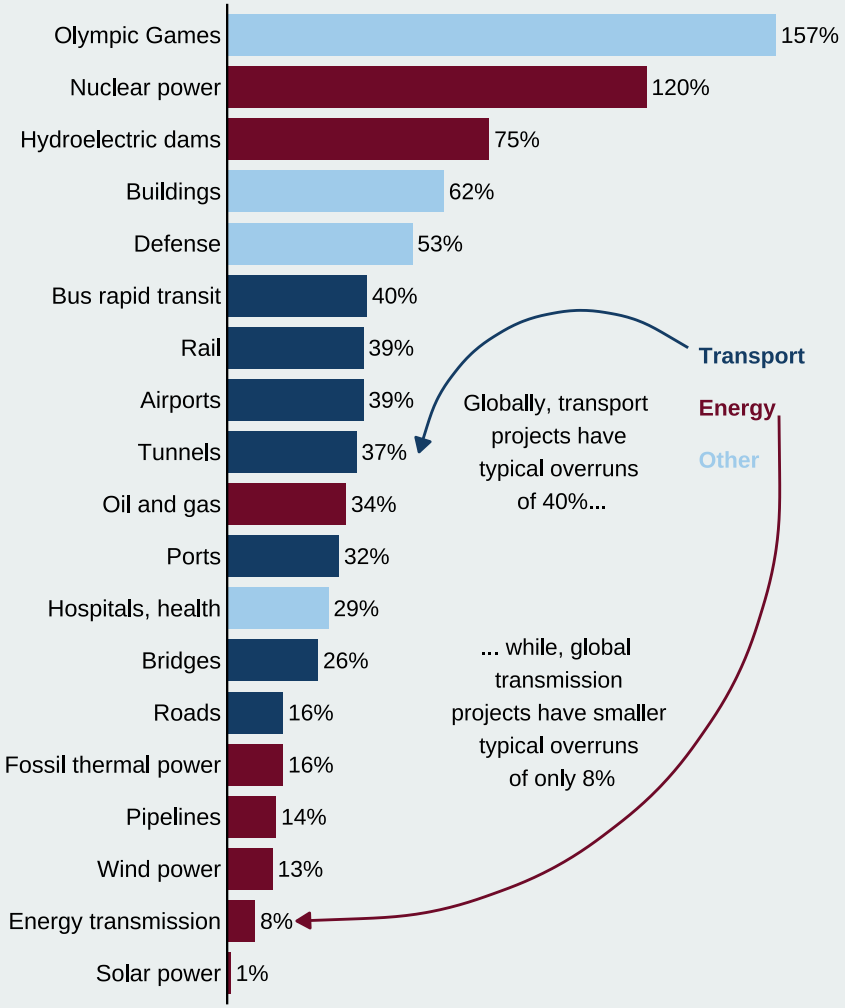
The projects that are set to dominate our energy pipeline — transmission lines, solar and wind generation, utility-scale storage, and (possibly) gas peaking plants — are historically less prone to cost overruns. However, the database does not reflect the last few years of global experience with major transmission projects where costs have accelerated as demand has ramped up in response to efforts at decarbonisation.[23]

The remaining chapters in this paper identify factors that drove cost overruns and delays in Australia's major transport boom, and apply lessons learned to the upcoming energy boom. The objective is to contain costs on major energy projects through Australia's energy transition.

[22] Bent Flyvbjerg and Dan Gardner (2023)
[23] The Flyvbjerg database is up to 2023.

Figure 8: Global cost overruns on megaprojects are common

Average cost overrun, globally



Note: This is based on a sample of more than 16,000 projects. Overrun is measured as the mean cost overrun in real terms. Data is up to 2023 and excludes more recent projects.
Source: Bent Flyvbjerg and Dan Gardner (2023)

4 Energy megaprojects have just begun

Australia's energy transition has been underway for some time, but investment has been focused on renewable generation. The megaproject component of the transition — largely, new transmission infrastructure — has only just begun.

The energy transition commenced with growth in renewable energy generation at the household, industry and utility level. More recently, energy storage has been added to the mix. Down the track, Australia will grapple with the electrification of the transport system, the closure of baseload coal-fired generation and the introduction of the dispatchable energy sources (pumped hydro, battery storage or gas) needed to maintain grid stability.

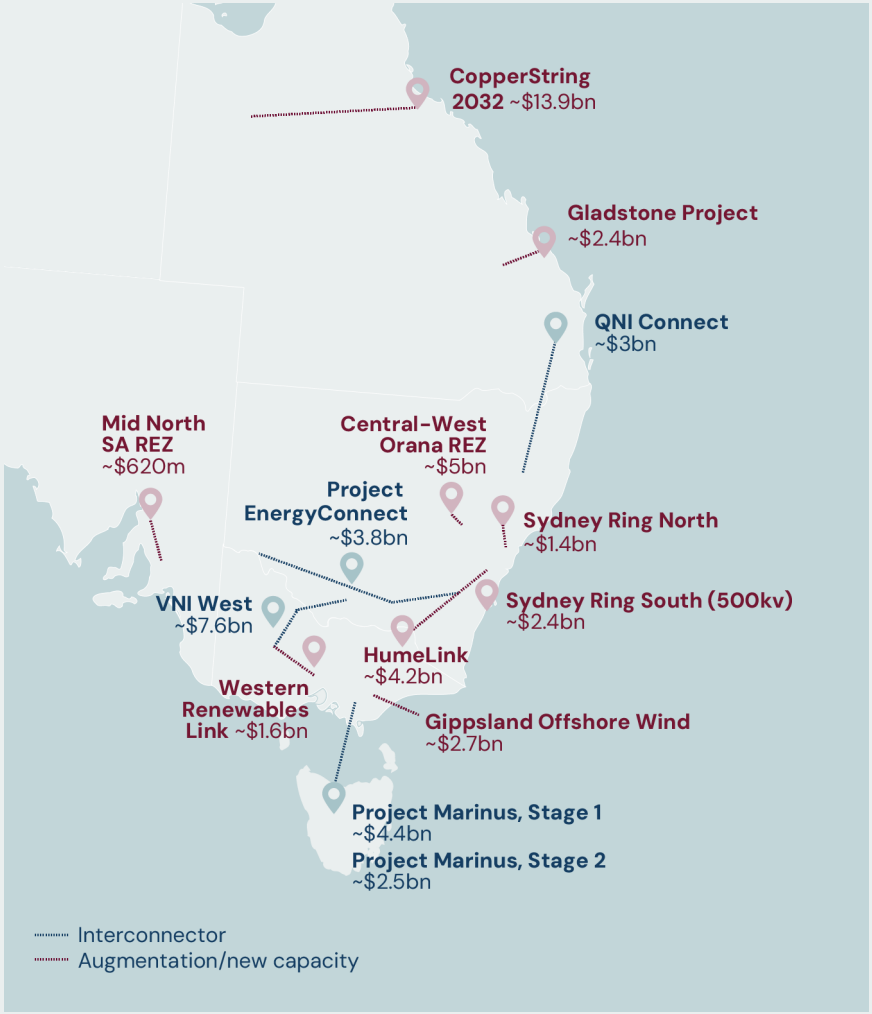
Transmission is the focus of this paper. Transmission is essential and networked public infrastructure. Building transmission lines is comparable to the way we deliver other essential services, including public roads and rail. The forward pipeline is expensive and technically complex, and its delivery will influence the success of our energy transition.

AEMO currently estimates that Australia's east-coast transmission grid will require investment of $65–$85 billion, or at least $8.5 billion per year through 2035 to facilitate the closure of coal-fired generation and reorientation of the NEM. AEMO's Integrated System Plan (ISP) nominates 26 projects required to augment the NEM, but only seven have been contracted.[24] It is not too late to get the settings right to contain the costs of the coming transmission build.

[24] See Appendix A for more detail on project taxonomy. (Australian Energy Market Operator, 2025b)

Figure 9: A large expansion of the grid is underway

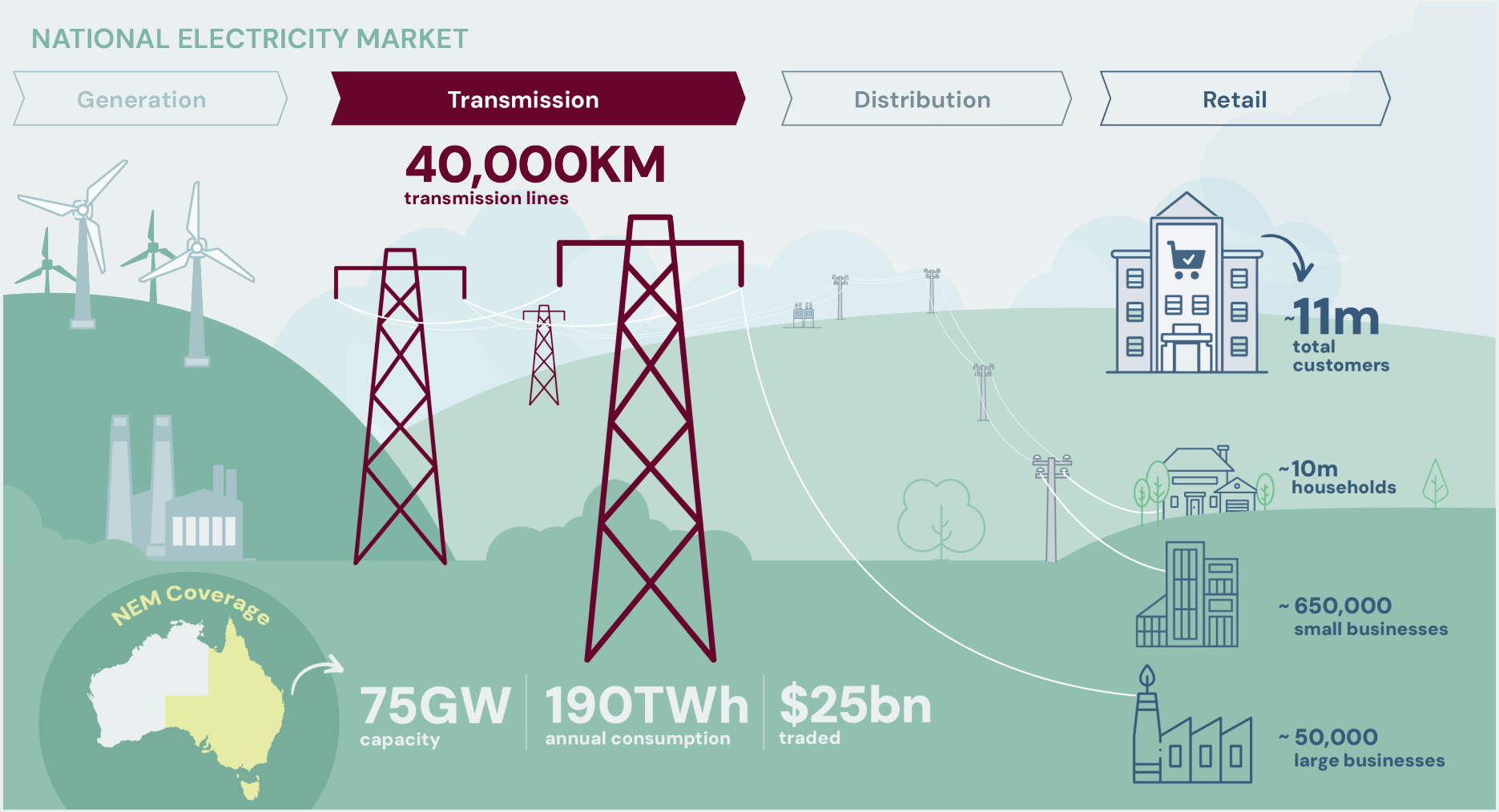
Selected major east-coast transmission projects



Note: Mapping is illustrative and does not reflect exact route. All data is presented in real 2025 dollars. See Appendix A for detail on the methodology. Augmentations/new capacity connect new generation and storage to the grid. Interconnectors are cross-jurisdictional links that connect the NEM together. TNSPs also conduct ongoing investment in transmission networks to maintain reliability or replace ageing assets, which are not captured here.

Source: Australian Energy Regulator (2025d); PricewaterhouseCoopers (2025); Transgrid (2025); Australian Energy Regulator (2024b); Australian Energy Regulator (2026b); Energy Corporation of New South Wales (2025b); Australian Energy Market Operator (2025b)

Figure 10: Australia's National Electricity Market: an explainer



Note: Policy Institute Australia has used the estimated number of households in the NEM jurisdictions to measure residential electricity consumers. Generation capacity excludes 25 GW of rooftop solar.
Source: Australian Energy Regulator (2025e); Australian Energy Regulator (2025a); Australian Energy Market Operator (2025f); Australian Energy Regulator (2026a); Australian Energy Market Operator (2026a)

4.1 A changing National Electricity Market

Australia has a unique electricity system. It is centred on a transmission grid that runs continuously from northern Queensland to Tasmania, servicing all of Australia except Western Australia and the Northern Territory. Few jurisdictions outside Australia feature a grid of this size and scale.

This grid — known as the National Electricity Market (or NEM)[25] — is the focus of this paper (Figure 10).[26] The NEM is a physical system of 40,000 km of transmission lines that send electricity to more than 10 million households across the east coast, South Australia and Tasmania. The physical NEM enables electricity to be traded in a wholesale market, which is also referred to as the NEM. And a transformation of the NEM is underway.

Up until this century, coal fired generators produced 80% of the NEM's electricity. But Australia's fleet of coal-fired generators, most of which were commissioned in the 1960s or 1970s, is getting old.[27] Several coal-fired power stations have recently been decommissioned, and most are nearing end-of-life. The rest of Australia's coal-fired power stations are expected to close over the next two decades (Figure 11). Ageing coal plants are increasingly costly to run, and require high levels of maintenance to keep them running.[28]

[25] The NEM was a 1990s reform that gave retailers access to lowest-price power, 24 hours a day, across the eastern seaboard. This coincided with the privatisation of parts of the generation, transmission and distribution network. In Victoria the entire electricity system is privately owned, but other states saw limited or no privatisation.

[26] This paper does not consider the arrangements in WA's South West Interconnected System.

[27] Climate Council (2025)

[28] Australian Energy Regulator (2025e)

Figure 11: Closure of Australia's east-coast coal-fired power stations

Coal-fired power stations, anticipated closure dates and maximum capacity

Coal-fired power station closure dates as of March 2026.
Source: Australian Energy Market Operator (2025d); OpenInfraMap (2025)

Some states have offered subsidies for plants to remain open, but these can run to hundreds of millions of dollars per plant per year. The NSW Government offered up to $450 million over two years for Eraring Power Station to stay open from 2025 to 2027.[29] Its owner Origin Energy announced in January 2026 that it would extend its operations until April 2029.[30]

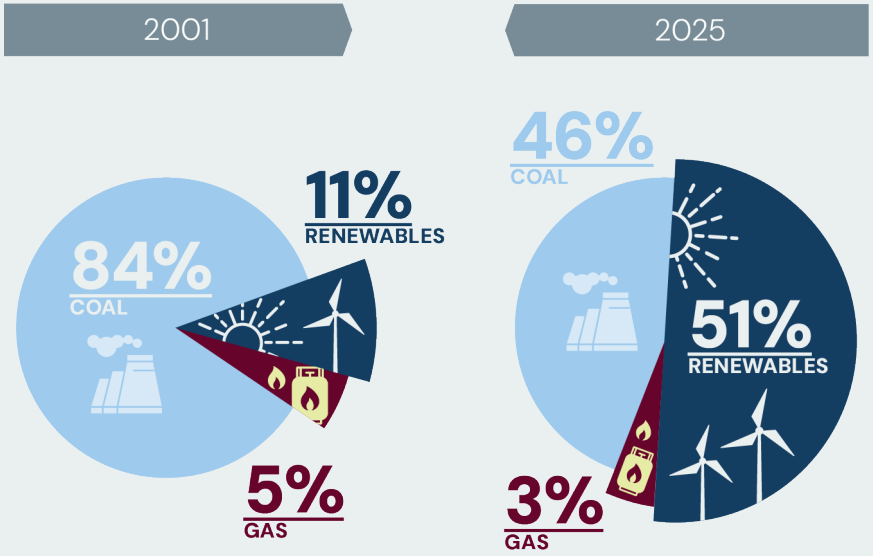
Governments at the state and Commonwealth level and from both sides of politics have introduced policies to support the energy transition. The Albanese Government has a publicly stated goal to have an 82% renewables grid by 2030 and to achieve net zero emissions by 2050.[31] They have also committed to reducing emissions to 62–70% below 2005 levels by 2035.[32] Among the states, Victoria has a goal to reach net-zero greenhouse gas emissions by 2045, while NSW and Queensland are aiming for 2050.[33]

Given that Australia's energy system is our highest source of carbon emissions, efforts to replace coal-fired generation began well ahead of the adoption of emission reduction targets, but have since accelerated (Figure 12). Renewable generation now produces just over half of all output in the NEM, having overtaken the combined share of black and brown coal (46% of generation) and gas (3%) in 2025.[34]

[29] The Australia Institute (2025)
[30] ABC News (2026)
[31] Australian Labor Party (2025)
[32] Department of Climate Change, Energy, the Environment and Water (2025b)
[33] Department of Energy, Environment and Climate Action (2025); NSW Government (2025); Queensland Treasury (2025)
[34] This was for Q4, 2025. (Australian Energy Market Operator, 2026b)

Figure 12: Renewables are 50% of NEM generation

Share of electricity output, MWh, NEM



Note: 2001 represents full calendar year of output. 2025 represents Q4 2025, the latest quarter of data available.
Source: Environment Victoria (2011), Australian Energy Market Operator (2026b)

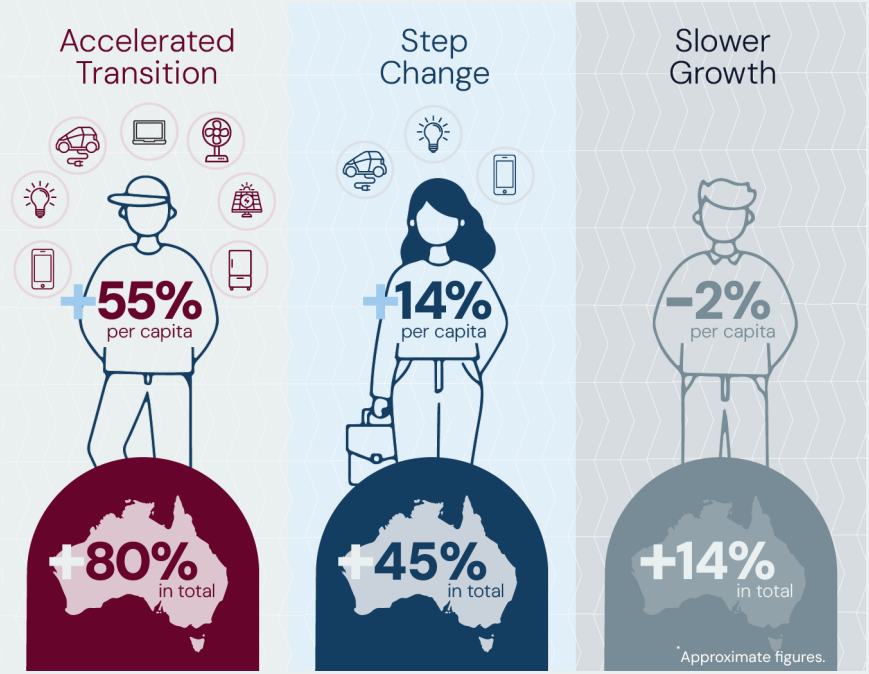
But the transition to a renewables-based energy system is a challenging task for the NEM grid due to:

- *Location of generation* — The grid was constructed to take power from a small number of large coal-fired generators and transmit it across Australia's east coast. Renewable generation has a much more dispersed footprint, and is most effective if located where the sun shines and the wind blows. New locations require network augmentation or introduction of new lines to extend the grid and relieve congestion.
- *Reliability of supply and grid stability* — The intermittency of renewables, which are weather dependent, can risk instability in the grid. They must be 'firmed' by other assets that can provide energy on call when energy demand cannot be met by renewable generation. Firming assets include grid-scale batteries, pumped hydro and gas peaking plants; these must be connected to the grid in the right locations — for example suitable pumped-hydro locations in particular are often a long way from generation assets or users — meaning additional transmission capacity is needed.[35]
- *Meeting increased demand* — The electricity system is facing increased demand — from a growing population, increased electricity use (for example through the shift to electric vehicles), and rising energy demand due to the energy-intensive needs of artificial intelligence and related data centres (Figure 13).

[35] The future location of firming assets remains uncertain. The 2017 Finkel Review noted that work was needed to secure the NEM and ensure a reliable electricity supply (Finkel AO, 2017). Since then, the rate of incidents in the NEM has accelerated and AEMO has had to intervene in some instances to suspend the market.

Figure 13: Demand for electricity is rising

Projected change in electricity usage, total and per capita, 2026 to 2040, under different AEMO ISP Scenarios



Note: Electricity consumption reflects operational (sent out) annual projections in the NEM published by AEMO for different growth scenarios. Policy Institute Australia has analysed this data, as well as population projections published by the ABS, to estimate per capita changes. The three scenarios are from the Draft 2026 ISP. Under *Step Change*, Australia achieves the objectives of government policy to transition the energy system, with the economy growing at historical rates. Under *Accelerated Transition*, there is additional upside of a faster growing population, due to migration, and a faster growing economy, alongside other drivers of decarbonisation including increased electrification. Under *Slower Growth*, economic growth is slower and a material proportion of the business sector closes.

Source: Australian Bureau of Statistics (2023); Australian Energy Market Operator (2025c); Australian Energy Market Operator (2025a)

In an effort to concentrate renewable generation to support the needs of the grid, all NEM states are developing 'Renewable Energy Zones' (or REZs).[36] The latest AEMO report outlines 44 current or candidate REZs across the NEM.[37] New transmission capacity is needed to bring power from these REZs to users.

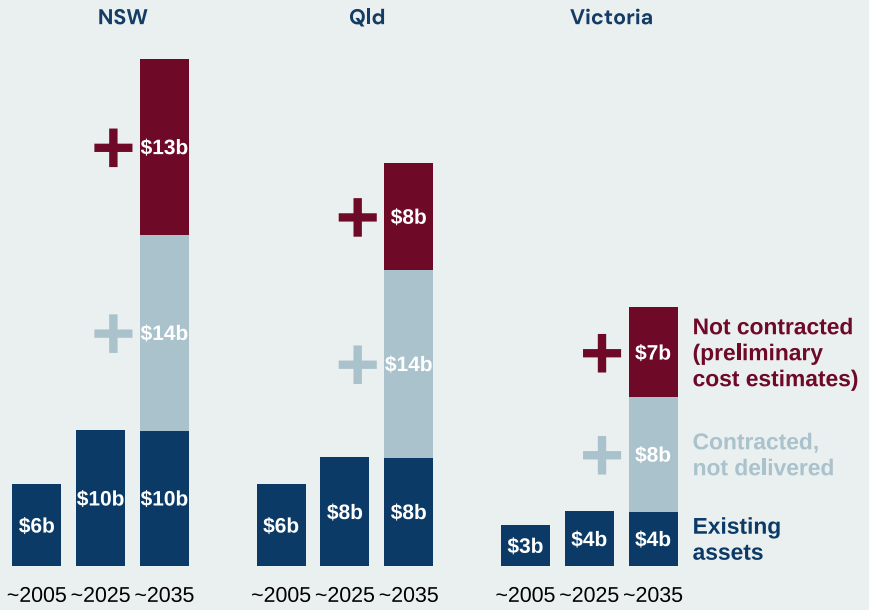
4.2 Transmission is a large part of the energy megaproject pipeline

A total of $85 billion in contracted work is underway for energy works across Australia — spanning transmission, generation (wind and solar) and large-scale storage including batteries and pumped hydro (including Snowy 2.0).[38] This includes seven transmission projects with a contracted value of $33 billion that are 'committed' or 'anticipated' by AEMO (i.e. considerably progressed).[39]

AEMO has projected that by 2050 the NEM will require around 6,000 km of new transmission lines, adding approximately 15% to the current grid.[40] In addition to these seven committed or anticipated projects, AEMO identifies a further 19 new transmission projects to produce this capacity (See Table 2 in Appendix A).[41] The total value of 26 transmission projects in AEMO's forward pipeline is estimated at $65–$85 billion. Adding this to the NEM's regulatory asset base (RAB) will more than triple its current value of $28 billion (for transmission), increasing it to $93–$113 billion. The relatively low current value of the NEM's RAB reflects its age, as most of the grid was built more than 50 years ago and in financial terms has been largely depreciated (Figure 14).

Figure 14: The value of transmission is set to more than triple

Estimated value of RAB, transmission, $ billion, constant 2025 $



Note: Historical RAB points for Transgrid (2004), Energy Australia (2004), Powerlink (2007) and AusNet (2003) are adjusted to constant $2025 dollars. This reflects Policy Institute Australia analysis of the potential value of the RAB, once current projects are completed. This analysis does not consider the impact of concessionary finance or government grants. See Appendix A for more detail on the methodology.
Source: Australian Energy Regulator (2007); Australian Energy Regulator (2025e)

Without intervention, further cost escalation beyond $113 billion is not just

[36] Australian Energy Market Operator (2025a).
[37] Australian Energy Market Operator (2025a)
[38] Infrastructure Partnerships Australia (2025a)
[39] See Table 2 for a detailed list of projects and Appendix B for methodology.
[40] See Appendix A for more detail.
[41] These are the major projects listed in AEMO's 2026 ISP.(Australian Energy Market Operator, 2025b)

possible, but likely.

As an example, Marinus Link, a new transmission cable being built between Victoria and Tasmania, recently had its RAB and regulated revenues approved by the Australian Energy Regulator (AER). The regulatory asset value has been set at close to $4.3 billion ($2025) at the time it is expected to enter service in 2030, with Victoria set to bear 72.4% of the regulated revenues.[42] This makes this single cable worth about 10% more, in real terms, than the current value of the entire existing transmission system in Victoria.[43]

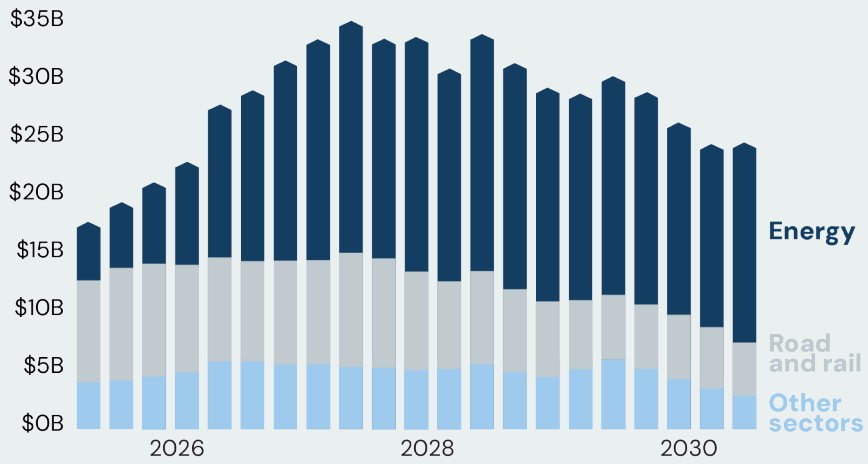
Looking at AEMO's list of committed and future projects, the gap in cost between current and future projects is large. The average total cost of the first seven projects underway to date is $4.8 billion. The 19 future projects on AEMO's list that include a cost estimate but have not yet gone to market have an average value of $1.8 billion. As projects get closer, the cost of projects in the pipeline appears very likely to rise.

Current timelines are unlikely to be met. Infrastructure Partnerships Australia's data shows that energy pipeline delivery — including generation projects, and projects that have not yet reached financial close — is expected to peak in 2027-28, with investment of close to $35 billion a quarter (Figure 15).[44] However, Infrastructure Partnerships Australia notes that it is highly unlikely that the forecast as presented will eventuate. Projects are likely to be delayed further, as capacity constraints bite, or projects hit hurdles accessing land, procuring cables or transformers, or with regulation.

With the peak of the pipeline unlikely to hit for several more years, and plenty of cost escalation risk ahead, we still have time to drive cost efficiencies through a better approach.

Figure 15: Energy dominates the major infrastructure pipeline

Modelled infrastructure pipeline, quarterly, by sector



Note: Other sectors include water and sewerage, social and other projects.
Source: Infrastructure Partnerships Australia (2025a)

[42] This has been adjusted into constant, $2025 dollars, for comparability. See Appendix A for more detail.
[43] Australian Energy Regulator (2024a); AusNet (2025)
[44] This projection is based off estimates provided by project proponents on expected delivery timelines and modelling using data on where a project is in its planning pathway.

4.3 Cost estimates for transmission are rising at an alarming rate

The transmission roll-out has only just commenced, but is already experiencing serious delay and cost escalation. Most transmission projects have been delayed by an average of around two years.[45] Some of these projects — including QNI Connect, VNI West and Western Renewables Link — are expected to finish construction five years after initially planned. (Figure 16)

Costs are rising quickly. Policy Institute Australia analysis of successive ISP documents shows that, in many cases, current estimates for project capital costs are two or three times larger than the upper bound of estimates that were provided in the 2020 ISP.[46] The total expected cost of transmission investment has nearly tripled, in real terms, from $30 billion to $65–$85 billion.[47] Costs are highly likely to escalate further, as many identified transmission projects are yet to be fully scoped and have a large margin of error around their cost estimates.

There are several factors driving rapid upward revisions of cost estimates.

First, the novelty of developing large-scale, greenfield transmission projects in Australia means that there was limited real-world data on which to base initial estimates. This has made forecasting a difficult task.

Second, costs and delays related to establishing easements, access to sites and community acceptance (sometimes grouped together as 'social license'), were greatly underestimated.[48] This is discussed in Chapter 5.

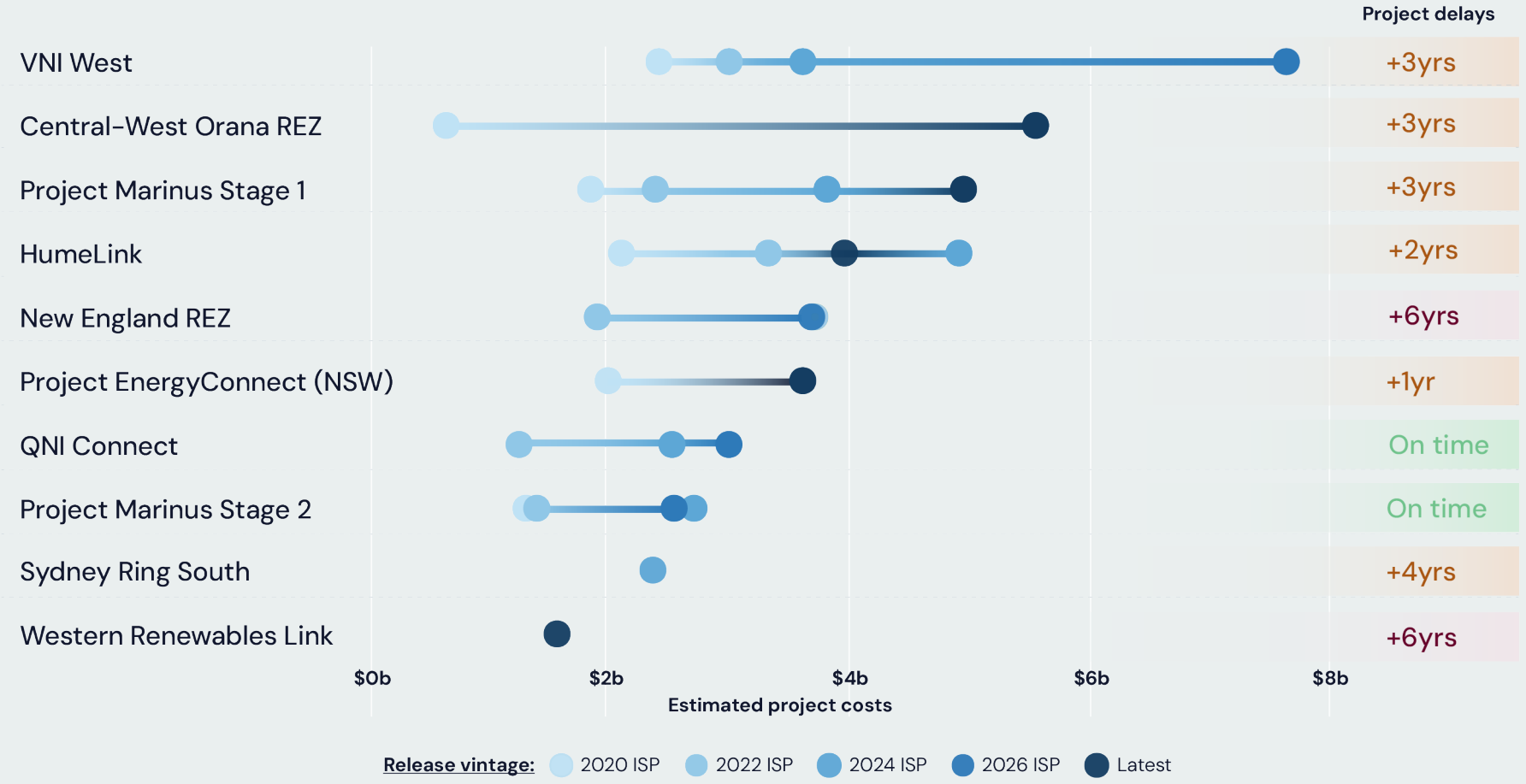
Finally, efforts to accelerate the energy transition globally have driven up prices for transmission equipment. Between the 2024 and 2026 ISP, AEMO flagged that the cost estimates for transmission network projects increased by up to 100%.[49]

Delays don't just increase construction costs; they can affect the connection of generation assets, which in turn affects electricity prices. Modelling undertaken by Infrastructure Victoria warns that the exit of reliable generation without timely replacement may create significant demand-supply imbalances, which would translate into material price increases for consumers.[50] In short, prices spike when not enough energy is generated to meet demand. When coal-fired Hazelwood power station in Victoria was unexpectedly closed in March 2017, wholesale spot prices in Victoria jumped by 85% compared with 2016.[51]

[45] Clean Energy Investor Group (2025)
[46] Policy Institute Australia analysis of latest published cost estimates for major projects. (Australian Energy Market Operator, 2020)
[47] This compares initial project cost estimates to the latest cost estimates. Refer to Appendix A for more detail.
[48] Australian Energy Market Commission (2022)
[49] The IEA estimates that more than 80 million kilometres of power lines are needed, globally, by 2040 to 'meet national climate targets and support energy security'(International Energy Agency, 2023)
[50] Infrastructure Victoria (2024)
[51] Australian Energy Regulator (2018)

Figure 16: The transmission roll-out has suffered cost overruns and significant delays

Select transmission projects, cost estimates and estimated completion date changes



Note: See Appendix A for a detailed table of project cost estimates and their reference years.

Source: Australian Energy Market Operator (2020); Australian Energy Market Operator (2022); Australian Energy Market Operator (2024a); Australian Energy Market Operator (2025b)

4.4 Consumers bear the cost of grid investment

The huge and growing cost of planned transmission investment will pass directly through to consumers.

Rising electricity bills are already a pain point for Australian households, having risen much faster than CPI over the past 10 years (Figure 17). The causes are debated and have varied, but are broadly attributable to the price of gas, the ageing of the coal-fired power station fleet, and new investment.[52]

Unlike in the transport sector where costs are diffused across taxpayers through government balance sheets, in the energy sector consumers pay for any new infrastructure investment, including upgrades and maintenance for the electricity grid.

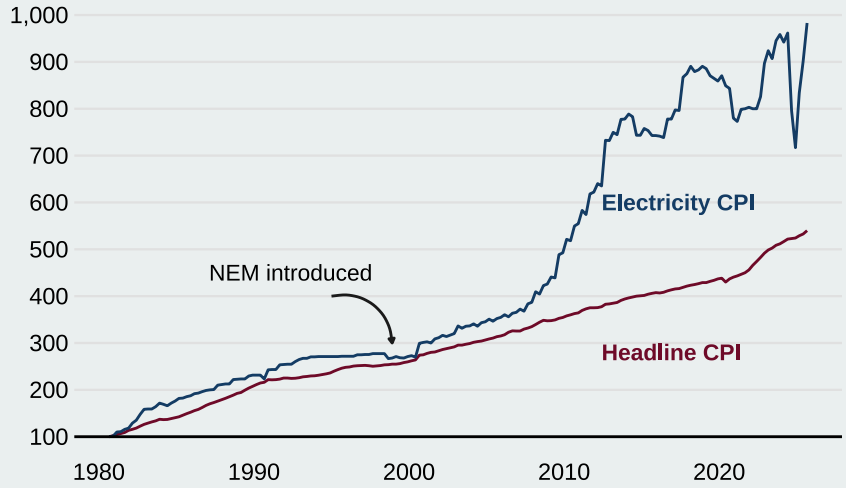
Transmission and distribution network charges are regulated by the AER on a state-by-state basis, and are intended to cover the costs of investing in, building, maintaining and operating the networks, allowing for a reasonable profit. They reflect the value of the transmission and distribution networks in each jurisdiction, a return on invested capital known as the weighted average cost of capital (WACC), as well as operating expenses.

Within a typical household electricity bill of just over $2,100 per year, about 40% of the cost — around $800 — is paid to transmission *and* distribution network service providers (Figure 18). Of the total bill, transmission has traditionally contributed only 9%, or about $200 per year, but this has been during a period where the established grid mainly required maintenance work and minor augmentations, rather than large expansions.

Much of the impact of the transmission buildout has yet to flow through to household electricity bills.

Figure 17: Electricity price rises have exceeded inflation

CPI, headline and electricity, Australia, index to 100 in September 1980.



Note: Electricity rebates, such as those provided in the Energy Bill Relief Fund program, affect the CPI results by reducing the electricity CPI index, which creates some of the variation in the most recent years.
Source: Australian Bureau of Statistics (2025c)

[52] Climate Council (2026); Grattan Institute (2014)

Box 1: Estimating the potential impact of transmission megaprojects on household electricity bills

Policy Institute Australia has estimated how the $65–$85 billion in forecast capital expenditure would flow through to electricity bills for consumers using two different conceptual approaches.

The first approach is a top-down estimated annual cost per household, using the return on capital and depreciation a TNSP may be expected to earn from the increase in its RAB, scaled for the number of households in each state. Applying that rate to the incremental asset base gives an estimate of the additional network revenue to be recovered in 2035 — around $2.0 billion in NSW, $1.6 billion in Queensland and $1.1 billion in Victoria. Dividing that revenue across the estimated number of households in each state provides an indicative per-household impact.

The second approach is a bottom-up estimate using the transmission component of existing retail electricity bills, based on publicly available 2024-25 default market offers for residential customers without controlled load in Queensland and New South Wales, from Energex, Ausgrid, Endeavour Energy, and Essential Energy. The estimate for a 'typical residential customer' included an estimated $200 transmission cost (as part of the network cost) for a consumer on a default market offer of just over $2,100 per year. Or, alternatively, transmission costs represented around 9% of total costs for a residential customer.

Based on these default offers, we estimated the impact of transmission capital expenditure on the *network charge* of an electricity bill, by scaling the expected increase in the RAB in each state. As an illustration, if the typical transmission component of a bill is $200, and the value of the RAB triples, the assumed transmission component of a bill would move from $200 to $600 and increase the total cost of an electricity bill by 19%.

These two approaches yielded similar results of an increase of around $600 per annum to an 'average' household bill.

While regulatory decisions on increases to the value of the RAB are public and transparent, the ways in which these are passed through to consumers is more difficult to ascertain. The treatment of network charges, including transmission, varies by retailer across the NEM states. As such the default offers we found are representative, but wide variations across households are probable.

All cost estimates are limited to the impact of the network charge component of the bill only. The estimates are a gross impact. They do not include second order effects such as changes to the generation mix that may decrease other components, such as wholesale electricity costs. The intent of the analysis is to show the scale of the transmission infrastructure projects underway for a 'typical' Australian household and small business.

As capital costs grow and are recouped through growth of TNSPs' approved RAB, consumers will pay more for transmission. Policy Institute Australia estimates that the $65 billion to $85 billion in forecast capital expenditure could cost an east-coast Australian household an extra $600 each year, on average, once these projects enter the RAB and are recouped from consumers. This is equal to about a 25% increase in household electricity bills.[53]

Policy Institute Australia estimates that a typical small business would also see an increase in their energy bills of about 25%. For a small business with an annual consumption of up to 100,000 kWh per year, this would add around $10,000 in annual electricity costs.[54]

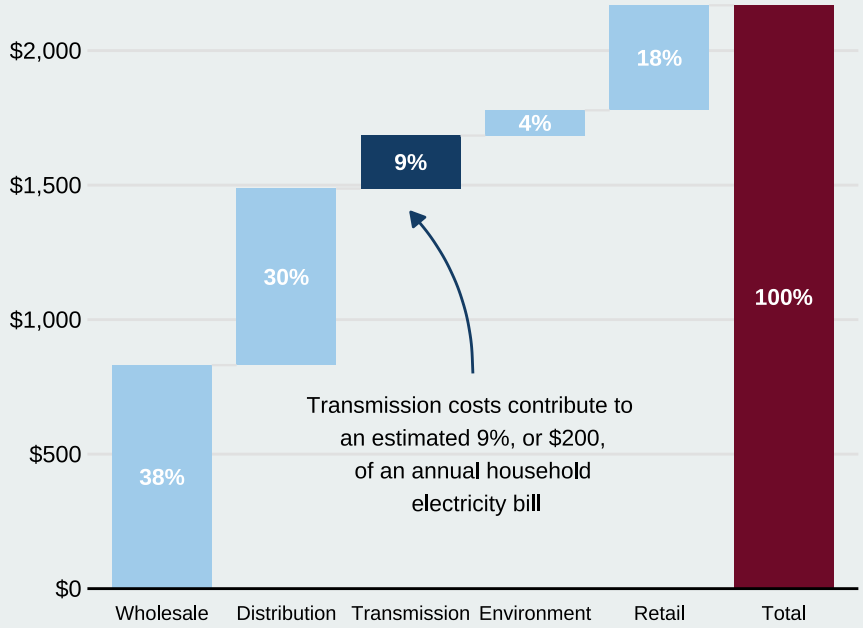
The pass through of rising network costs on household electricity bills is a topic of debate in other jurisdictions as well. At an Energy Security and Net Zero Committee hearing in the UK in 2025, the CEO of a large UK energy retailer noted that[55]:

> If I look at the non-commodity costs — policy costs and network costs — certainly some of the modelling that we have suggests that you could get to a position by 2030 where, if the wholesale price was zero, bills would still be the same as they are today because of the increase in those non-commodity costs.

[53] See methodology in Appendix A for more detail.
[54] See methodology in Appendix A for more detail.
[55] House of Commons (2025)

Figure 18: Transmission costs are historically a low share of residential electricity bills

Components of a residential electricity bill, 2024-25, default market offer



Note: Calculated off an average of default market offers from four providers in NSW and Queensland. Segmentation between transmission and distribution was not provided, and has been estimated using a ratio of the size of the RAB for distribution and transmission. Retail costs include retail margin. Environmental costs are due to the Large-scale Renewable Energy Target (LRET) and Small-scale Renewable Energy Scheme (SRES). See Appendix A for more details.
Source: Policy Institute Australia analysis of Australian Energy Regulator (2025e)

Network cost projections in the Australian Energy Market Commission's (AEMC) recent Residential Electricity Price Trends 2025 report are stable over the next 10 years. However, the AEMC also noted that a delayed transmission build is a

major risk. The AEMC estimates that a delay of the Marinus Link, VNI West, New England REZ, Gladstone and CopperString projects by 12 months alongside a 30% increase in associated network costs may, alongside delays to wind projects, lead to up to a 20% increase in annual household electricity costs.[56]

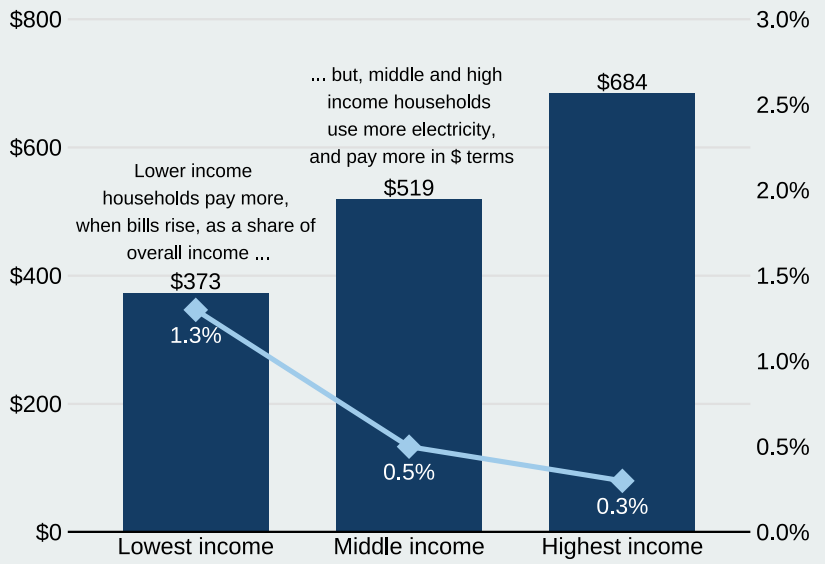
Finally, there is a distributional concern as to which consumers will bear any increase in network charges. Network charges are typically passed through to consumers in proportion to the electricity they use, so that higher users pay more. Higher income households that use more electricity would tend to pay a higher network charge in dollar terms. However, as a share of income, lower income households will feel these increases more keenly (Figure 19). For a low income NSW household in the bottom 20% of the income distribution, a 20% increase in the electricity bill is equivalent to a 1.3% wage cut. Similarly, households that are less able to reduce their reliance on the grid use by installing solar panels and household batteries will pay a higher share of the transmission build — though both households rely on the grid.

The AEMC is currently exploring electricity pricing, including network tariffs, under a self-initiated review that released a draft report in December 2025.[57] The AEMC noted that "network tariffs do not allocate shared costs fairly among electricity consumers", where "customers that benefit the most from their use of the network pay the least for it."

[56] Australian Energy Market Commission (2025b)
[57] Australian Energy Market Commission (2025a)

Figure 19: Electricity bill increases are disproportionately borne by lower income households

Estimated impact from a 20% residential electricity bill rise, NSW, by household income, LHS = $ impact, RHS = % of household income



Note: This analysis estimates the annual household electricity costs for a NSW household. This uses mean, gross household income data by quintile, including lowest income (lowest quintile), middle income (third quintile) and highest income (highest quintile). Survey data provides consumption estimates in kWh.
Source: Policy Institute Australia analysis based on The Australia Institute (2018); Australian Bureau of Statistics (2022); Australian Energy Market Commission (2025b)

The AEMC's draft report recommended that network tariff design focus on efficiency, and that networks design tariffs for energy service providers rather than directly for consumers. The view from industry observers in response

to these recommendations were that they would "default towards a network pricing end-state dominated by fixed charges, without apparent justification or clear assessment of consumer impacts".[58]

4.5 Funding is becoming more opaque

As costs have risen with major transmission projects, governments have begun subsidising the cost of the transmission build. This has often occurred in ad hoc and fairly opaque ways, particularly when compared with the more traditional and well-known mechanisms used to fund transport infrastructure at both the state and Commonwealth level. Government funding reduces the direct flow through of costs to consumers by reducing the investment required by TNSPs into the project, and therefore the value of the RAB. (Box 2).

The following three sections of this paper put forward recommendations to reduce the cost of the transmission build, for the benefit of consumers and taxpayers alike.

[58] Nexa Advisory (2026)

Box 2: Defraying transmission costs to consumers

Direct capital grants for infrastructure investment — such as the construction costs for new transmission lines — can reduce cost pass through to energy consumers. An example of this is the Queensland Government providing $2.4 billion for the CopperString energy infrastructure project.[a] This can reduce the private capital expenditure that must be repaid by consumers.[b]

Concessional finance — i.e. debt provided at below-market rates — can reduce the cost of capital for energy infrastructure projects, so that investors earn a lower return to pay for their investment, directly reducing the amount charged on bills. It has been reported that the $3.8 billion in concessional finance provided for the Marinus Link transmission project connecting Tasmania and Victoria is estimated to save customers $900 million over the first five years of the project's life.[c]

Subsidies for retail energy bills can directly reduce the amount consumers pay on their bills, defraying costs of any energy investment. An example of this is the Energy Bill Relief Fund, which, under the 2024-25 program, provided up to $300 of energy bill relief for households and $325 for small businesses.[d]

[a] Queensland Treasury (2026)
[b] Capital contributions are not included in the RAB and are not used to calculate returns in the regulatory framework. Australian Energy Regulator (2020)
[c] ABC News (2025b)
[d] Department of Climate Change, Energy, the Environment and Water (2025a)

5 Good projects come from good planning

5.1 Poor planning, often politically driven, leads to higher costs

Australia's transport boom has reinforced the importance of robust upfront planning in megaprojects, a lesson that must be applied to transmission.

The transport boom surfaced multiple examples of massive cost overruns resulting from poor planning. The opportunity to shape the vision of a nation is compelling for politicians and their constituents, but election-related commitments often lack sufficient scoping, robust business cases and bottom-up costings.

Major projects guru Bent Flyvbjerg, in his book *How Big Things Get Done*, notes that weak front-end planning is a major reason behind cost blowouts on major projects. He argues that projects need to "think slow, act fast" to be successful.[59]

'Scope creep' — where a project's original scope is expanded — is more likely when planning time is squeezed. Scope creep may aim to provide better amenity for local communities, or improve environmental outcomes. But this also adds to costs, and when added in late, adds more to costs than if scoped earlier.

Poor planning and weak or insufficient early scoping can lead to initial costings that are artificially low. When costs inevitably rise, there is a perception of a cost blowout when in reality the budget envelope provided was always going to be insufficient for the scope.

This has real consequences. Cost overruns on major projects this century have cost Australians an average of $1.7 billion a year, with overruns between 2001 and 2020 estimated to total $34 billion, or 21% more than initially planned.[60] Victoria's Suburban Rail Loop is perhaps the most often cited example of poor upfront planning (Box 3), but is certainly not the only one. Other projects – such as the Sydney Metro, or Cross River Rail in Brisbane — have also had significant cost overruns.

One of the lessons of the transport boom is the criticality of the processes that encourage the discipline to "think slow, act fast" in infrastructure delivery.

Specifically, cost containment will usually benefit from separating the activity of creating a 'business case'[61] for a project (outlining in broad terms what the project is and the justification for it) and an 'investment case'[62] (which details the project scope, design and cost). This separation allows politicians to retain the remit to develop visionary infrastructure plans and announce projects on their schedule, but reserves time for proper project planning to take place, including consideration of alternative solutions, undertaking due diligence to understand the likely costs, timelines and risks; and settling the project scope.

[59] Bent Flyvbjerg and Dan Gardner (2023)

[60] Grattan Institute (2020)

[61] Sometimes called an 'initial business case'

[62] Sometimes called a 'final business case'

Box 3: Suburban Rail Loop — not looping in the public service

The Suburban Rail Loop (SRL) was announced as a $50 billion, 90-kilometre orbital railway line across Melbourne.

Initial planning for the project was poor. The Victorian Ombudsman noted that it was "at odds with core aspects of the Westminster tradition" and kept "completely secret from people in the [Victorian Public Service] and broader public sector normally responsible for advising upon major transport infrastructure projects."[a] As an example, the head of the transport department was left out of planning.[b]

Since announcement, the expected project cost has increased. The Victorian PBO estimates that just the East and North components of the SRL will cost approximately $96.4 billion to build.[c]

Infrastructure Australia's Stage 3 evaluation in early 2025 recommended that the Commonwealth defer funding to Victoria until further information was provided, including cost benefit analysis.[d] The Commonwealth Government indicated in December 2025 that the 2026/27 Budget would commit additional funds to the project.[e] The project remains without an updated publicly available business case.

[a] Victorian Ombudsman (2023)
[b] Victorian Ombudsman (2023)
[c] Parliamentary Budget Office (2024)
[d] Infrastructure Australia (2025e)
[e] ABC News (2025c)

5.2 Planning in transport and transmission — same, and different

Transport and transmission projects have some common planning challenges.

Both involve linear infrastructure, typically crossing private properties and multiple communities. Long-term planning in this context greatly assists with managing costs around establishing corridors, acquiring land, negotiating easements, and engaging constructively with local communities.

In both transport and energy, networks in different states and territories connect with each other, and must work together. Road and rail networks cross state borders, and it is crucial that road and rail networks on either side of a border align.[63] In the energy grid, this interconnectedness is even more complex from a technical perspective. Coordination across the NEM is thus crucial.

Another important difference is the distribution of benefits. Urban transport projects are typically geographically concentrated and deliver visible local benefits, which can build political and community support.

By contrast, transmission lines built to accommodate new renewable power generation often run through regional areas, where the scale of the new build is significant and perceived local benefit is limited. Community acceptance, or lack thereof, has proven more contentious and more time-consuming in transmission than the experience seen in most recent transport projects.

[63] The story of mismatched rail gauges in Australia demonstrated this point. (Inflection Points, 2025)

The drivers of cost overruns can differ. In transport, overruns have often been associated with construction complexity — particularly tunnelling, brownfield interfaces and scope changes. This can be compounded by premature or politicised project announcements and immature business cases. In transmission, the construction challenge is generally less complex, but early cost estimates have frequently understated the costs associated with land acquisition, route changes, environmental mitigation and the practical realities of building at pace across multiple jurisdictions.

In both cases, pressure created by policy-driven timelines to commence and complete projects runs the risk of cost overruns when projects are progressed before planning risks — such as scoping, site selection and land acquisition — have been fully resolved.

Finally, transmission assets are owned by separate, standalone entities - private and public - across all NEM states. In transport, planning is done in departments, and governments are the clear asset owners with notable exception of a few toll roads. Governments take quite a different approach to strategic planning in transport as asset owners than in transmission.

The history of rushed or poorly scoped projects is rife in transport, and the risk of a repeated experience appears to be rising in transmission. Snowy Hydro 2.0 (a storage project with significant transmission implications) saw a rushed announcement process akin to some transport projects (Box 4). Some have also criticised the Marinus Link transmission interconnector being built between Tasmania and Victoria as having been driven by political considerations.[64]

[64] Australian Financial Review (2022)

Box 4: Snowy Hydro 2.0 — a rushed announcement

The Snowy Hydro 2.0 project was announced in 2017 as a $2 billion pumped-hydro and large-scale storage project. The project was announced before a robust business case had been undertaken and less than two weeks after Snowy Hydro put the proposal to the Prime Minister's Office.[a] Since then, the cost of the project has increased, with a latest 2023 estimate of approximately $12 billion.[b]

Much of this can be attributed to insufficient front-end planning and design to properly understand geological and ground condition risks and to undertake feasibility studies.[c]

The purpose of the project was to provide more dispatchable storage to the NEM. There is still debate in the industry about whether it is the right project, or whether it is potentially crowding out investment in alternative solutions, such as battery projects.[d] There is broad consensus that it was poorly planned. One experienced industry stakeholder remarked: "It's a remarkable project, and impressive engineering, but it's probably going to be the most expensive electricity in the world".

[a] ABC News (2017)
[b] Australian Financial Review (2025c)
[c] Discussion with industry stakeholders.
[d] Discussion with industry stakeholders.

5.3 Current transmission planning is not best practice

Responsibility for transmission planning in the NEM states was historically undertaken by government. The state-owned, vertically integrated electricity organisations that originally ran the state-based electricity system were responsible for upgrading or extending their grid network to meet the needs of their part of the grid. Once the grid was completed, new capital expenditure requirements were relatively low.

Responsibilities have shifted over time, first in response to the break up of state-owned electricity organisations and privatisation, and then in response to the creation of the NEM. The evolution has resulted in a set of governance arrangements that are not well suited to strategic planning of major public infrastructure investment.

5.3.1 Transmission planning is shared across entities

Transmission lines in the NEM are today owned by a mix of public and private TNSPs (Table 1). The largest TNSPs started out as state-owned organisations. Reforms in the 1990s saw the assets divested from state-owned organisations and privatised. In all states, transmission was separated from generation and retailing of electricity (and from distribution in all states except Tasmania). The TNSPs became regulated monopolies with a mix of public and private ownership in different jurisdictions.

Today, TNSPs in Victoria, New South Wales and South Australia are fully privatised. The shareholders are domestic and foreign investors, who hold these assets as relatively safe annuities that deliver a steady return through regulated revenue.[65] Other states, including Tasmania and Queensland, have retained state ownership of transmission assets. Regardless of ownership, electricity consumers pay TNSPs for their network costs. These costs are related to the value ascribed to their grid assets (the RAB).

Some new TNSPs are entering the market in some states as REZs are being developed and new transmission lines are built with new owners. For example, ACEREZ will be a new TNSP once the Central-West Orana REZ is completed in New South Wales.[66]

As the need to plan, finance and deliver larger transmission projects for the energy transition developed, issues emerged with a TNSP-led planning system. Existing TNSP owners were reluctant to undertake greenfield projects under a regulated return framework that did not commercially reward riskier projects. The challenges of the transition have been widely recognised, and have led to piecemeal changes, often varying between jurisdictions.

[65] Discussion with industry stakeholders.
[66] ACEREZ (2026)

Table 1: Transmission line ownership is mixed

Entity	State	Network	Ownership
Regulated TNSPs in the NEM			
AusNet	Vic	~6,200 km	**Private** – Controlled by Brookfield (Canada)
Transgrid	NSW / ACT	~13,000 km	**Private** – Owned by a consortium
ACEREZ	NSW	~240 km	**Private** – ACCIONA, COBRA and Endeavour Energy
Powerlink	Qld	~14,500 km	**Public** – Queensland Government Owned Corporation
ElectraNet	SA	~6,200 km	**Private** – State Grid Corp of China; Australian Utilities Trust
TasNet-works	Tas	~3,300 km	**Public** – Tasmanian Government State Owned Corporation
Privately-owned regulated interconnectors			
Murraylink	SA-Vic	~180 km	**Private** – Energy Infrastructure Investments (operated by APA Group)
Directlink	NSW–Qld	~60 km	**Private** – Energy Infrastructure Investments (operated by APA Group)
Basslink	Vic–Tas	~370 km	**Private** – APA Group

Note: ACEREZ will design, build, finance, operate and maintain the Central-West Orana Renewable Energy Zone Transmission Network project.

Source: Australian Energy Regulator (2025e) AusNet (2022); Transgrid (2020); ACEREZ (2026); Powerlink (2026); TasNetworks (2026); APA Group (2026b); APA Group (2026a); APA Group (2025)

The result is that transmission planning is undertaken by a patchwork of entities:

1. **AEMO** — As the market operator, AEMO projects capacity needs for the NEM. AEMO publishes its ISP every two years, which outlines the lowest cost pathway for maintaining reliability and security while also meeting government policy targets.
2. **TNSPs** — In all states except Victoria, the TNSP holds transmission planning powers, with varying scope. State-owned Powerlink undertakes system planning across Queensland, while privately owned Transgrid undertakes system planning in NSW except for in relation to REZs.[67]
3. **State-government entities** — Some states have recently created their own planning entities under state-based legislative frameworks. In New South Wales, EnergyCo was tasked with leading the delivery of REZs under the NSW Government's Electricity Infrastructure Roadmap.[68] In Victoria, VicGrid published the first Victorian Transmission Plan in 2025, setting out a long-term plan for transmission investment, including the required new transmission investments required in the next 15 years to support REZ development.[69]
4. **Other private sector entities** — In some cases, the private sector may also propose and develop their own transmission lines (typically called connection assets). This includes heavy industry and data centres.

[67] The NSW Transmission Planning Review recommended that Transgrid transfer planning functions to EnergyCo (NSW Energy, 2025).
[68] Energy Corporation of New South Wales (2025a); Department of Environment, Land, Water and Planning Victoria (2021)
[69] VicGrid (2025b)

Planning functions in the NEM are thus distributed between an 'independent' national body (AEMO), public and private asset owners (i.e. TNSPs), and state entities (VicGrid, EnergyCo).

5.3.2 Strategic transmission planning should not sit with TNSPs as asset owners

Some TNSPs, including private TNSPs, hold planning responsibilities as *jurisdictional transmission planning bodies*. This includes the privately owned Transgrid (in NSW and the ACT) and ElectraNet (in South Australia), and the publicly owned Powerlink (in Queensland) and TasNetworks (in Tasmania). Victoria is the only state to separate planning powers from asset ownership, with government entity VicGrid recently being empowered to hold the planning functions previously held by AEMO (Box 5).

Each jurisdictional transmission planning body produces annual planning reports which draw upon the ISP to outline specific investment needs and drivers. This includes details of potential network investments. The plan must cover the next ten years.

There is inherent misalignment in incentives when existing monopoly asset owners hold formal planning functions, and where the costs of projects are passed through to consumers. TNSPs' regulated return is based on their RAB, including capital expenditure. Over time, investment in infrastructure increases the value of the RAB, which increases the revenue that is recovered from electricity consumers through network charges.

This framework creates a structural incentive for TNSPs to favour higher capital expenditure. But TNSPs' regulated return does not reflect the higher risk involved with large-scale greenfield transmission builds, and is perhaps insufficient to incentivise this type of investment.

As noted by the AER, 'there is limited precedent for the AER in regulating and TNSPs in developing projects of this size'.[70] Some stakeholders raised concerns that the natural inclination of TNSPs (including subsidiaries) to prioritise their commercial interests may not serve public interests.

There is also a high degree of technical asymmetry involved. Few entities acting in the interest of electricity consumers outside of AEMO and the TNSPs possess specialist knowledge to independently assess whether a proposed project is optimally scoped, or potentially under- or over-engineered.

Identifying misaligned incentives does not imply improper behaviour on behalf of TNSPs. TNSPs should be expected to act in their own commercial interests, and for privately owned TNSPs, those of their shareholders. Checks and balances do exist. The AER must approve new capital expenditure and has knocked back requests for higher capital expenditure. For example, for Transgrid's 2023–2028 Determination, the AER approved $2.4 billion of capital expenditure, rather than Transgrid's proposed $2.6 billion.[71]

Still, the risk of excessive spend is high. The analogy in transport would be empowering privately-owned toll road operator Transurban to plan parts of Melbourne and Sydney's road network.

[70] Australian Energy Regulator (2021)
[71] Australian Energy Regulator (2023)

Box 5: Victoria has separated planning and asset ownership

Transmission planning in Victoria has historically been separate from asset ownership of the transmission grid. Victoria was the first state to privatise the electricity industry in the mid 1990s, before the rules governing the NEM had been designed.[a] To overcome the incentive for privately-owned transmission businesses to over-invest, transmission planning was structurally separated from transmission asset ownership and operation.[b]

Victoria remains the only state to have planning powers completely separated from asset ownership. VicGrid has recently taken over this function from AEMO Victorian Planning, under changes from the *National Electricity (Victoria) Amendment (VicGrid) Act 2024*.

VicGrid must publish a Victorian transmission plan that sets out the optimal set of projects needed, and released the first Victorian Transmission Plan in 2025 to set out a long-term plan for REZs and transmission investment, including the required new transmission investments in the next 15 years to support REZ development.[c]

[a] ACCC (2023)
[b] ACCC (2023)
[c] VicGrid (2025b)

5.3.3 AEMO's role as system planner has limitations

AEMO wears many hats in the energy transition. AEMO has roles in transmission planning; grid strength and support; gas market reliability and security; and market and system advisory and analysis.[72] It plays a key role as National Transmission Planner (Box 6). Its part-owned subsidiary, AusEnergy Services Limited, provides procurement services including running tenders for the Capacity Investment Scheme, and acts as the Consumer Trustee under the NSW Energy Infrastructure Roadmap, including to run tenders for LTESAs to incentivise new energy generation, storage and infrastructure.[73] Until very recently, AEMO acted as transmission planner in Victoria. AEMO also created Transmission Company Victoria to progress the VNI West project, including to engage with local landholders, community and Traditional Owners.[74]

AEMO's many different roles, and governance structure, can create a perception of conflicts of interest. AEMO is registered under the Corporations Act 2001 as a member-based not-for-profit, with membership split by government (60%, Commonwealth and states) and industry (40%).[75] The industry membership includes the TNSPs, electricity retailers, electricity generators, and many energy-intensive businesses including manufacturers. As such, AEMO as market operator is a member organisation and not an independent public body.

A 2024 report from the Select Committee on Energy Planning and Regulation

[72] Department of Climate Change, Energy, the Environment and Water (2026)
[73] AusEnergy Services Limited (2026)
[74] The Senate (2024); Transmission Company Victoria (2023)
[75] Australian Energy Market Operator (2025g)

in Australia explored the role and function of AEMO (among many other items) in its terms of reference. The inquiry had many submissions regarding AEMO's role. For example, Erne Energy submitted that "AEMO is a deeply conflicted organisation" that has "many conflicting roles, well outside the original intent at the establishment of the NEM".[76]

Box 6: AEMO's role as National Transmission Planner

AEMO's role as "National Transmission Planner" takes it into a territory beyond what a typical market operator would perform. These functions as set out in Section 49 of the National Electricity Law include:[a]

- Prepare, maintain and publish a plan for the development of the national transmission grid
- Establish and maintain a database of information relevant to planning the development of the national transmission grid and to make the database available to the public
- Keep the national transmission grid under review and provide advice on the development of the grid or projects that could affect the grid
- Provide a national strategic perspective for transmission planning and coordination
- Any other functions conferred on AEMO under this Law or the Rules in its capacity as National Transmission Planner

[a] Parliament of South Australia (2025)

[76] The Senate (2024)

In February 2026, the Minister for Climate Change and Energy announced a review into AEMO's governance. The review's terms of reference states an intention to ensure that AEMO's governance remains fit-for-purpose for today, and in a future market design.[77] The terms of reference include evaluating AEMO's legal, membership and corporate structure; the potential for divestment; integrity and transparency considerations; and other arrangements.

This may help address some of the perceptions of conflict of interest, but it is not clear if the terms of reference include AEMO's role and powers as national transmission planner, and the allocation of responsibilities between the states and Commonwealth in transmission planning and delivery.

5.4 The ISP should offer real options

The most comprehensive long-term strategic planning process for the NEM takes place through AEMO's ISP, a whole-of-system plan that AEMO updates every two years. The ISP was introduced in 2018, in response to the Finkel Review, and aims to provide an integrated road map for the development of the NEM over a 20-year horizon.[78] It has been produced every two years since, with the latest draft 2026 ISP published in late 2025.

The ISP's stated objective is to set out the lowest cost path to meet changes in the future energy mix. It takes into account forecast electricity demand,

[77] Department of Climate Change, Energy, the Environment and Water (2026)
[78] Australian Energy Market Operator (2018)

government energy and emissions targets, and other factors.[79] As part of the ISP, AEMO outlines the Optimal Development Path (ODP), which is the set mix of generation, storage and network investment required to meet these goals. The ISP has a significant impact on transmission network investments.

Across the industry, the ISP has been recognised as an important and much needed document to support the energy transition. Stakeholders consulted for this paper spoke about both the difficulty, and the importance, of AEMO's task. One stakeholder viewed the ISP as a 'fantastic document' and one that 'Australia needed'. The ISP is developed with detailed, and public modelling, and significant consultation across the industry. The Draft 2026 ISP was developed over 18 months with consultation from more than 1,400 stakeholders and nearly 250 written submissions.[80]

5.4.1 The ISP is not a least-cost roadmap

But the ISP is an often misinterpreted report.[81] It is *not* the lowest-cost pathway for any future grid, as may be commonly perceived. Rather, it is the lowest point-in-time cost pathway to meet Commonwealth, state and territory government policy objectives. Where policy objectives are set with poor understanding as to cost, the ISP has the effect of baking in political announcements with insufficient effort to understand their cost implications. In the words of AEMO's CEO: [82]

> The ISP is not a tool to evaluate government policy. It's a tool to say what needs to be delivered in order for that government policy to succeed.

Dr Dylan McConnell, a Senior Research Associate at UNSW, also raised a similar point regarding the ISP:[83]

> There is this issue of AEMO reflecting government policy and being held up as an independent source of advice, when in actual fact it may just be reflecting government decisions. That in itself is not necessarily a bad thing, except for this sort of accountability and transparency point where it's held up as an independent system planner when it is very much doing planning activities for different jurisdictions.

Many stakeholders consulted for this paper described the ISP as a black box and an increasingly politicised report. Some describe the ISP as an 'engineering desktop analysis task' that does not subject projects to a robust economic investment or business case. Others suggested some parties in the ecosystem have tried to 'game the system' by introducing policies that would have the effect of ensuring specific transmission projects would feature in the ISP.

5.4.2 The ISP cannot adequately estimate project costs

A key issue with the ISP is its estimate of costs. These have been consistently and severely underestimated, in large part because the ISP is designed as a top-down desktop analysis rather than a bottom-up costing (see Chapter 4). In this, the ISP is more akin to an investment case than a business case. Factors

[79] Australian Energy Market Operator (2025b)
[80] Australian Energy Market Operator (2025b)
[81] Discussions with industry stakeholders
[82] Australian Financial Review (2025b)
[83] The Senate (2024)

that are driving project costs up, such as site-specific factors influencing land access costs, are difficult to assess adequately in the ISP.

Negotiations with landholders also affect project timing. Site access is needed to conduct survey work during route identification and environmental assessments; construction of transmission lines; and ongoing maintenance once built. Easements are required to formally provide a 'right of way' for existing or future lines to be built, much like how existing residential property owners may have easements on their property for shared driveways or powerlines, sewerage and other assets.[84]

A range of parties are involved in site access arrangements. Where TNSPs are responsible for planning and delivering projects, the responsibility falls to them. But the inexperience of TNSPs in negotiating with communities to deliver large greenfield projects has been evident, with stakeholders considering that the immaturity of TNSPs in managing relationships with the community and landholders having contributed to project delays.

Being a desktop analytical exercise, land access and acquisition costs have been severely underestimated in successive ISPs.

5.4.3 The Actionable ISP framework affects project selection

A key issue with AEMO's planning framework is the link between the ISP and AEMO's list of actionable projects. AEMO has considerable planning powers through the Actionable ISP Framework, which was introduced for the 2020 ISP. This framework enables AEMO to declare network projects as Actionable, meaning they should progress "as urgently as possible".[85]

Declaring a project Actionable triggers the relevant TNSP to undertake a Regulatory Investment Test for Transmission (RIT-T) — i.e. an economic assessment — for individual projects.[86] The intent of this change was to give AEMO the power to decide which projects are needed for the grid.

In theory, AEMO declaring a project Actionable is simply one step toward a project being undertaken. AEMO is explicit that a project being declared Actionable does not necessarily imply that the project will go ahead — for example in their most recent draft ISP, where they flag that QNI Connect may not go ahead if consumer benefits do not stack up.[87]

However in practice, once AEMO declares a project Actionable, it becomes very likely that it will proceed, even if new information dramatically changes its estimated costs or benefits. As one example, the 2020 ISP identified VNI West as an Actionable project to be progressed urgently by the privately-owned NSW TNSP, Transgrid. In the 2020 ISP, AEMO noted that, for VNI West to deliver positive net market benefits, "project costs have to be below $2.6 billion based on 2020 ISP assumptions".[88] At the time, the project was expected to cost approximately $2.4 billion ($2019). The latest draft 2026 ISP indicates that VNI

[84] AusNet (2026)

[85] Australian Energy Market Operator (2022)

[86] The AER notes that the Regulatory Investment Test (RIT) is a cost benefit analysis designed to identify the credible option that maximises the net economic benefit for an identified need. Actionable projects that do not undergo the RIT-T are progressed under a jurisdictional framework.Australian Energy Regulator (2026c); Australian Energy Market Operator (2025e)

[87] Australian Energy Market Operator (2025b)

[88] Australian Energy Market Operator (2020)

West is expected to cost $7.6 billion (and could cost as high as $11.4 billion).[89] Still, the project is going ahead.

Projects listed on AEMO's ISP (including Actionable and future projects) have cost estimates published. Projects that are earlier in the development stage have large error bands (often up to ±50%) with some assumptions based on the cost of developing the transmission assets (including civil and structural works, electrical works, design and surveys, etc) and allowances for various risk factors.[90] This is, in effect, an early and high-level estimate of what a project may cost. But the process of a full costing under an investment case can occur much later, which may not occur until after a project has effectively been accepted as required for the NEM by AEMO. This may mean that projects are given the go-ahead too early, which is a substantial deviation from best practice in infrastructure planning and delivery.

AEMO's decision making process in deciding which projects are Actionable after close consultation with TNSPs, but before any more detailed bottom-up cost estimates are undertaken, leaves open the potential for unexamined and untested cost escalation. TNSPs may unduly benefit from that decision and the network costs that are passed on to consumers may be higher than is necessary to deliver to the NEM's reliability and security standard.

[89] 2025 dollars.

[90] For example, early stage projects are class 5a or 5b and are developed using a 'buildings block' approach. This is effectively a desktop engineering exercise, based on a database pulled together by GHD. As GHD note, it is not intended to be used for detailed estimation of more advanced projects, which require greater design and project definition. (GHD, 2025a)

5.5 State governments are the proper planning authorities

Under Australia's federal system of government, the states hold primary responsibility for delivering major infrastructure— from major roads and rail, to hospitals, stadiums and desalination plants. This derives from states' responsibilities for land use and planning in the Constitution.

Transmission has become the exception to the rule, due to the way network planning in the NEM has evolved over time. But it is now time for states to be given sufficient levers to exercise the same degree of authority over transmission investment decisions that they do over all other major public infrastructure projects in their jurisdictions. This would help ensure the investment decisions are being made in the public interest and for the long-term benefit of the consumers who will pay for them.

The powers that states hold for land use and planning, as well as their experience and expertise, is a powerful argument in favour of greater state involvement in transmission planning. It has been the experience to date that push back against transmission lines being built are naturally escalated to state governments in most cases. State governments are also responsible for setting the rules upon which landholder negotiations take place (Box 7).

Box 7: Recent changes to landholder policies

States have introduced compensation schemes for landholders. In Victoria, landholders who host new transmission are paid $200,000 per kilometre of new transmission easement over 25 years.[a] New South Wales introduced a Strategic Benefit Payments Scheme to private landholders who host a permanent easement in their property, with $200,000 per kilometre over 20 years.[b] Queensland has a similar scheme.[c]

Laws have been changed in Victoria to support compulsory acquisition, with the *National Electricity (Victoria) Amendment (VicGrid Stage 2 Reform) Bill 2025* giving powers for transmission proponents to compulsorily acquire land for transmission projects, which are broadly comparable to the *Land Acquisition and Compensation Act 1986* for transport projects.

In NSW, the Goldmate court case has been overturned, which, in practice, may mean higher acquisition costs for infrastructure projects in NSW.[d]

[a] VicGrid (2025a)
[b] Energy Corporation of New South Wales (2025c)
[c] Renew Economy (2023)
[d] Goldmate Property is a developer that owns land in the transport corridor for the Western Sydney Airport. In 2024, Goldmate lost a court case that allowed the NSW Government to "disregard more valuable zoning", with, following the court case, some residents reportedly being offered "just 40% of the property's potential value". However, the Goldmate decision was overturned on appeal. (ABC News, 2024;Colin Biggers & Paisley, 2024)

The role of the Commonwealth in major projects has historically been as funder or co-funder, although on some recent projects such as Inland Rail the Commonwealth has taken the lead. Voters expect that state governments will deliver infrastructure to meet their needs, and hold state governments responsible when things go wrong. This clarity is crucial. State governments have built up substantial experience in delivering major infrastructure projects, and hold key planning powers, which are a crucial enabler of major infrastructure projects, and allow states to conduct long-term planning to ensure that land corridors are kept in reserve for future major infrastructure projects.[91]

[91] Department of Planning and Environment NSW (2023)

5.6 Reform area 1: Clearer, more strategic planning in transmission

5.6.1 Take AEMO out of the driver's seat on transmission investment decisions

Recommendation 1: AEMO should no longer be the National Transmission Planner, and should no longer have the power to designate projects as "Actionable". Instead AEMO should play a coordinating role as National Transmission Coordinator, including ensuring NEM system stability and avoiding unnecessary duplication in transmission infrastructure. AEMO should also provide advice to the states on the development of any interconnectors between jurisdictions, to ensure efficient investment decisions.

AEMO has an important role to play in Australia's energy transition as the NEM's market operator, and its responsibilities to maintain secure electricity (and gas) systems and manage electricity (and gas) markets.

However, the role of AEMO in transmission planning should be reformed. AEMO's technical expertise and coordination function is a vital input to transmission planning across the NEM, and should be made through AEMO's role being recast as the "National Transmission Coordinator".

In this role, AEMO would provide advice to states and territories on transmission projects, including forecasting and modelling to support business and investment case development for states for individual projects, as well as advise states on the development of any interconnectors between jurisdictions.

5.6.2 States should hold primary responsibility for strategic transmission planning and decisions on new investment

Recommendation 2: State governments should be responsible for the strategic planning of all major transmission infrastructure. States should be responsible for all decisions to proceed with specific transmission investments, to be made following detailed business case assessments.

The current allocation of transmission planning, project selection and ownership has created blurred lines of responsibility. While formal roles are defined in legislation, in practice there is no single institution or level of government that has clear responsibility for ensuring that transmission infrastructure is delivered on time, at least cost, and with appropriate risk allocation.

To strengthen accountability, state governments should take primary responsibility for the strategic planning and procurement of major transmission infrastructure within their jurisdictions, including both REZ-related and broader network augmentations. [92]

States should be responsible for project selection, including to develop business cases for each project.

[92] This section only refers to states, as there are no territories delivering major transmission projects.

Under this model, the state would act as the formal "client" for major transmission developments. This does not imply that state governments would directly construct or operate the infrastructure. Delivery would continue to be undertaken by private-sector contractors and specialist operators under competitive procurement processes. However, a single accountable client would clarify risk ownership, improve coordination with other infrastructure programs, and sharpen incentives around cost and schedule performance.

5.6.3 Planning authority should be removed from TNSPs

> **Recommendation 3:** Major transmission planning functions that sit with a TNSP should be removed and transferred to a state government entity that is independent of asset ownership.

Planning is a public function and should sit in publicly accountable institutions. Each state in the NEM should establish (or formalise) a statutory transmission planning authority, responsible for all strategic planning. This would align with Victoria's recent changes to vest VicGrid (a state government entity) with all strategic transmission planning powers. These *Grid Planning Authorities* should be independent of the existing TNSPs, ensuring that planning functions of government are separated from asset ownership and removing real or potential conflicts of interest.

Each state's *Grid Planning Authority* would act as the jurisdictional transmission planning body for all major expansions of the network in their jurisdiction, including the new REZ developments. It would also be responsible for developing long-term strategic transmission plans for each state.

Every iteration of state transmission plans should focus as a priority on the cost implications for energy consumers (including both generation and network costs), as well as taxpayers.

The NEM would continue to exist as an entity and electricity would continue to flow and be traded between the state grids. AEMO would continue to have a role in system planning, but not the primary role.

States' leading role in transmission planning would include planning for any future interstate interconnectors, which would be by negotiation between the two host states, in consultation with AEMO.

Existing TNSPs in each state should retain the ability to work with the state jurisdictional transmission planning body, and AEMO, to propose minor upgrades to the grid.

This change would build off recent reforms that have occurred in Victoria (and to a partial extent in NSW), but would require each state to act separately and implement their own reform. To implement these reforms:

- New South Wales should expand the transmission planning responsibilities of EnergyCo beyond REZs to include transmission planning responsibilities that currently remain with Transgrid, the TNSP. This aligns with the recommendations of the recent NSW transmission planning review which recommended that this occur by the end of 2027.[93]

[93] NSW Energy (2025)

- Queensland and Tasmania should each move transmission planning powers into a state entity separate from their state-owned TNSP.
- South Australia should create a new, standalone state planning entity and remove the planning functions from ElectraNet, a private TNSP.

As part of their planning functions, *Grid Planning Authorities* should be responsible for undertaking and making public investment cases and business cases for all transmission projects. This transparency is fundamental to considered and critical public scrutiny of infrastructure projects.

5.6.4 Reposition the ISP, removing the Actionable framework

Recommendation 4: AEMO's ISP should be repositioned as a technical projection of alternative future grid pathways to inform state and Commonwealth decision making. The ISP should incorporate whole of system modelling and not be constrained by government policy but include multiple scenarios with more flexibility on how scenarios are selected.

AEMO should continue to publish an ISP, which provides a signal to the market on the potential future path of the grid. AEMO should no longer be able to declare projects as "Actionable' or make policy decisions about which projects should go ahead. This should be left with states and territories, but informed by AEMO's technical advice.

Instead, the ISP can be broadened to allow AEMO to publish multiple future scenarios. This could include:

- *A technology-neutral base case* that projects future electricity demand and generation mix without assuming any emissions policies. This scenario would provide a benchmark against which policy-driven pathways can be assessed.
- *A policy-aligned emissions case* that reflects current Commonwealth and state emissions targets and stated coal exit trajectories, allowing stakeholders to understand the transmission implications of achieving those objectives.
- *A slower coal exit case* that models system needs under extended coal plant operation, testing the sensitivity of transmission requirements to changes in coal exit timing.
- *A delivery-risk case* that assumes major transmission projects are delivered later than currently planned, highlighting the consequences of sequencing delays and allowing governments to prioritise accordingly.

Presenting these scenarios transparently would enable states and territories to make informed decisions about which projects to pursue, relative to their own emissions targets and individual policies. It would clarify AEMO's role by allowing it to provide expert technical advice and, to the extent possible, depoliticise the ISP as a document.

6 Containing costs through procurement

A fundamental aim of procurement is to contain costs through competitive bidding. Major public infrastructure projects across Australia are delivered through competitive procurement processes that award contracts for work to private civil construction companies. The procurement seeks to deliver best value for money on the project, with criteria including price as well as elements such as quality, capacity, innovation and ethical delivery.

Value for money through procurement is critically important in transmission, given that grids are monopoly assets where the cost of the infrastructure build is directly passed through to electricity consumers who have no alternative choice. Procurement is one of the few opportunities for containing price. Transmission projects are technically different to major transport projects, but procurement skill sets are similar, and experience in one sector is often relevant for another.

Procurement in major transport projects has evolved over the past two decades. The mistakes that were made, and lessons learned, are relevant for the forthcoming transmission build. Neither the private nor the public sector in Australia have recent experience with large greenfield transmission development. TNSPs have spent several decades undertaking only minor upgrades and maintenance works. The public sector has very little direct experience in procurement in the energy sector at all, including in generation and storage, given the dominant role of the private sector in this space. Aside from some parts of the mining sector, there are very few procurement teams in Australia with longstanding experience in major transmission projects.

As time has gone on, public sector procurement methodologies on major transport projects have moved toward private sector best practice. The approach requires a procurement team that has a complete understanding of the project scope, a sophisticated approach to procuring the construction services it needs and ideally an ability to actively manage its delivery pipeline.

6.1 Working with industry

In procuring major civil construction works, governments tend to contract with one of the three civil construction firms in Australia that build more than 70% of projects over $500 million nationally. There are reasons for this limited choice in large contractors, and evolving ways to promote competitive tension.

6.1.1 The megaproject market is dominated by three Tier 1's

Prior to the transport boom, Australia had many large civil contracting firms. But as the pipeline of major transport projects expanded, particularly from the 1990s onwards, the civil construction sector consolidated to achieve scale. Today, the 'big three' — CPB Contractors, John Holland and Acciona — sit atop the industry, and win the lion's share of the largest contracts. [94]

Scale was needed to marshal resources to deliver large project including labour, materials and machinery, as well as in contractors' capacity to carry financial risk

[94] Discussion with industry stakeholders.

on their balance sheets. As the track record of cost overruns developed, this need increased even more. Smaller firms were hesitant to bid for projects that could threaten their solvency if problems arose.[95] And governments became reluctant to award large contracts to smaller firms that lacked the financial capacity to absorb cost overruns.[96]

Over time, state governments became concerned with the limited competition available and went abroad to attract multinational contractors into Australia. A number of foreign firms entered Australia to compete for large government civil construction projects. However, foreign firms entering Australia have tended to acquire local firms.

One driver cited for local acquisition by offshore majors was the need to acquire a local workforce. Given the scale of major projects, a new global firm seeking to target a $100 million project would need around 200–250 people.[97] The need to acquire local knowledge was another factor — on regulation, procurement processes and union engagement. As one expert stated, "you have to deal with the vagaries of working in every state – how they operate, rules of engagement, skills recognition, etc." The complexity of Australia's industrial relations landscape combined with a tight jobs market contributes to this perceived need to operate as a local firm.

Today, there are three Tier 1 construction firms in Australia capable of delivering the largest infrastructure projects— CPB Contractors, John Holland and Acciona.

[95] Discussion with industry stakeholders.
[96] Discussion with industry stakeholders.
[97] Discussion with industry stakeholders.

Collectively, the 'Big 3' are awarded contracts on 72% of projects worth $500 million to $1 billion, and 68% of those more than $1 billion (Figure 20). This includes projects that are either self-managed, or in consortium type arrangements with other civil construction firms.

The *very* largest projects are often delivered jointly by two of the three Tier 1's. Victoria's $26 billion North-East Link involves CPB Contractors and John Holland, as well as WeBuild (among the largest contractors outside the three Tier 1's) and others. Around two-thirds of works packages over $500 million are either held by Tier 1's only, or by Tier 1's jointly with mid tier firms.[98]

Australia's three Tier 1's are now all owned by large multinational firms: Lendlease was acquired by the Spanish giant Acciona;[99] John Holland has since 2015 been a subsidiary of China Communications Construction Company (CCCC);[100] and CPB contractors is part of CIMIC group, whose parent company is the German construction giant Hochtief, itself controlled by the Spanish multinational ACS Group.[101]

6.1.2 Does high concentration translate to low competition?

With three firms winning contracts on more than 70% of projects over $500 million in the civil construction market, market concentration in Australia's civil construction industry appears high, particularly for large-scale infrastructure

[98] We do not distinguish between Tier 2 and Tier 3 contractors, and use the term 'mid tier' to refer to both.
[99] ACCC (2011); ACCIONA (2020)
[100] John Holland (2026)
[101] Business News (2022)

projects. At the surface, the implication is that clients looking to build major projects— including governments— have few contractors to choose from. The potential for competition in large civil construction projects appears to be limited.

But to conclude that there is an absence of competition on major projects is not quite right. Competition to win contracts remains fierce. Profitability in this part of the market has been low. Across the broader heavy and civil engineering sector, profitability — measured by EBITDA as a share of total income — has hovered at around 5-6% over the past decade. This has been lower than building construction (around 8%) and the total economy (14%)[102].

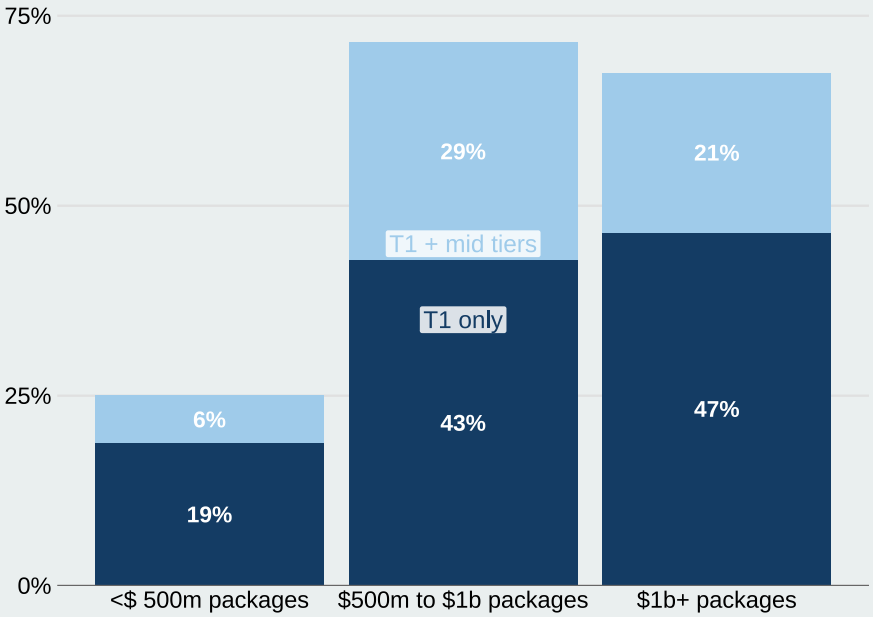
For the Tier 1 firms, reported profitability has also been poor. John Holland's latest financial report in 2023 showed an operating profit of 1.8%.[103] CIMIC Group's latest financial report in 2024 showed an operating profit of around 1.0%.[104] And Acciona's global 2024 results showed an operating profit of around 2.2% in 2024.[105]

Rather than being a hallmark of weak competition, or anti-competitive behaviour, the limited number of Tier 1 contractors in Australia is related to the overall size of the Australian market in major projects. With only a handful of packages over $500 million in value coming to market every year, the market may not be large enough to support many more large civil contracting firms. The much lower degree of concentration in the civil construction market for packages under $500 million suggests more competition at the mid-tier level.

[102] Australian Bureau of Statistics (2025a)
[103] John Holland (2023)
[104] CIMIC Group (2024)
[105] ACCIONA (2025)

Figure 20: Three Tier 1 firms are involved in most larger contracts

Estimated civil contractor involvement in individual work packages, road and rail, by package size



Note: The three Tier 1 firms are defined as CPB Contractors, John Holland and Acciona.
Source: Infrastructure Partnerships Australia (2025a)

6.2 Improvements in major project procurement

In the early days of the major transport project boom, state governments largely used fixed price contracts and awarded tenders based on lowest fixed price for delivery to specification. Contractors were contractually obligated to absorb the majority of delivery risk of the project. The risk transfer to the private sector was viewed as adding value for money by incentivising the contractor to deliver the project with greatest efficiency. [106]

But as the boom progressed, problems with fixed price contracts emerged. In many cases, projects carried risks that were too large for civil contractors to absorb, inappropriately allocated or poorly understood. Latent project risks that were not well articulated through the procurement process or final contracts were later realised, leading to contested contractual obligations and costs.

The small number of civil contractors in the market came to be seen as introducing risk. In 2025, the NSW Government announced a partnership with the ACCC to stamp out illegal bid rigging including in relation to infrastructure procurement.[107] In early 2026, the ACCC announced it would be using AI to detect bid rigging on tenders for the Brisbane 2032 Olympics.[108] Whether the effort will uncover collusion remains to be seen, but collusion is just one of several behaviours that can push up costs in construction procurement.

The limited number of large civil contractors shifts incentives for how procuring clients engage with contractors, and how contractors themselves perform work. Dependency on a small group of Tier 1 firms allows greater scope for Tier 1 contractors to seek claims and variations throughout contract delivery, squeezing extra revenue out of government clients (and taxpayers).[109]

The dominance of Tier 1 contractors and growth in project size also increases the risk that the failure of one project could lead to financial distress for a contractor and strand multiple major projects. This 'too big to fail' risk compounds the significant power Tier 1 firms hold in negotiations over contract variations with their government clients.

With the three largest contractors controlling such a large part of the infrastructure pipeline, a sense of fragility remains. As one industry expert stated, "If we had more Tier 1s or bigger Tier 2s in the industry, yes there would be more competition but there would also be more stability."

Over time, procurement approaches have evolved toward practices found in the private sector to better contain risks and costs through fit-for-purpose procurement methodologies and contract management. Approaches have become more bespoke, and the maturity of public sector procurement agencies as sophisticated buyers has improved. These changes are relevant to the forthcoming energy major project boom.

[106] Discussions with industry stakeholders.
[107] NSW Treasury (2025)
[108] Australian Financial Review (2026)
[109] Discussion with industry stakeholders.

Box 8: Liontown Resources case study

Liontown is a WA-based resources company that owns and operates Australia's first underground lithium mine. Policy Institute Australia sought Liontown's perspective on major project delivery, as complex mining projects share many attributes with major public infrastructure projects, including in the electricity sector.

Liontown places great weight on front-end discipline for scoping, recognising that poor engineering decisions and insufficient scoping early in a project have downstream impacts that are costly to rectify once construction is underway. The operational theory is that a project can be delivered to two of three criteria: speed, expense and quality. If the objective is lowest possible cost at highest possible quality, timelines must allow for sufficient scoping and planning both prior to and throughout project delivery.

Project scoping and planning will typically have around six discrete phases: scoping, pre-feasibility, feasibility, definitive feasibility, final investment decision and commencement. Complex projects will often include an additional 'Front End Engineering and Design (FEED)' phase, which can take 2–6 months. Where a 'front end engineering and design' phase is included, it allows the project team the ability to progress critical design and enabling works in parallel with building the business case to avoid down time when a final investment decision is made.

6.2.1 Maximise competition through fit-for-purpose procurement methodologies

Today, government procurement teams have a plethora of procurement options, with a better understanding of how to design a bespoke approach to suit the unique parameters of a specific project.

There are many ways of categorising the different types of procurement models that are now in use.[110] One example framework developed by the Victorian Government outlines:[111]

- *Lump sum models* include construct, or variations of design and construct. Common features include a fixed-price contract, clear delineation of responsibility and risks, and regular payments at key milestones.
- *Cost reimbursable models* include managing contractor, Incentivised Target Cost and alliance. Common features include frameworks to share risks between the client and contractor, incentive-based performance regimes, and cost transparency and open book arrangements (Box 9).
- *Whole-of-life models* include PPPs and similar arrangements. Common features include bundling design and construct with maintenance or operation of assets over a long-term contract, a lump sum contract, and payments based on utilisation and other performance standards.

[110] For example, the Victorian Department of Treasury and Finance, NSW Construction Leadership Group, and Department of Infrastructure, Regional Development and Cities publish detailed guidance ondifferent procurement models. Department of Treasury and Finance Victoria (2024); NSW Construction Leadership Group (2021); Department of Infrastructure, Regional Development and Cities (2016)

[111] Department of Treasury and Finance Victoria (2024)

Box 9: Victoria's Level Crossing Removal Project

The Victorian Level Crossing Removal Project (LXRP) – a decade long program to remove 110 level crossings and build new stations — is a cost reimbursable procurement model.[a] The work program was established as a series of four alliances.[b] Formal contracts were awarded incrementally, subject to ongoing performance provision of detailed works proposals and costings.

There are some detractors to this approach, and evidence of benefits is mixed. A review by the Victorian Auditor-General's Office found that in 2017 the program cost had increased by 38% relative to the initial estimate.[c] VAGO also found inherent risks in the procurement process, including reduced price and design competition because contracts beyond the initial sites were not subject to full price competition.

In theory, there are potential benefits to a programmatic approach if competitive tensions can be retained. Repeatability should drive incremental productivity gains as contractors learn from experience and become more efficient. Data sharing and benchmarking across contractors and works should provide procurement teams with benchmarks for future procurement rounds. Greater information can provide more transparency and, in theory, better returns to taxpayers.

[a] GHD (2025b)
[b] Victorian Auditor-General's Office (2025)
[c] Victorian Auditor-General's Office (2017)

Finally, in a point that is relevant to experience of transmission and the role of TNSPs, it should be noted that in the transport sector market-led proposals (Box 10) are viewed as poorly aligned with the objective of retaining competitive tensions in the procurement process.

Box 10: Market-led proposals do not promote competition

A market-led proposal (MLP) is when a private sector firm makes an unsolicited approach to government for support to deliver infrastructure or other services through direct negotiation, rather than a competitive procurement process.[a] There are several examples of MLPs in Australian transport that have been put forward to government. This includes Transurban's West Gate Tunnel project in Victoria and NorthConnex in Sydney.

There are many critics of MLPs. A review of the West Gate Tunnel project by the Victorian Auditor-General's Office found that the Victorian Department of Treasury and Finance's advice to government on the MLP was not sufficiently comprehensive due to limited analysis of alternative funding and delivery options. The review also found that by accepting Transurban's proposal, the state effectively chose not to exercise the other options available to it.[b]

[a] Victorian Auditor-General's Office (2019)
[b] Victorian Auditor-General's Office (2019)

6.2.2 More experienced and mature procurement teams

More bespoke procurement methodologies and contracting models require more mature and sophisticated procurement teams. Procurement teams need to be intelligent buyers of civil works to design and manage a program that will drive value for money through competition.

Major project guru Bent Flyvbjerg has found that top-shelf teams are critical to infrastructure delivery: 'The value of experienced teams cannot be overstated, yet it is routinely disregarded.'[112]

In the private sector, many Tier 1 and other large contractors are in the process of pivoting into transmission, as the transport infrastructure boom in NSW and Victoria slowly winds down. Teams with relevant skills that worked on transport megaprojects have moved or will move onto transmission projects.

But in the public sector, energy ministers and energy departments are typically separate and distinct from transport ministers and transport departments. The siloed nature of government departments means that by default major transport procurement experience will not shift across to transmission procurement.[113]

Many industry stakeholders observed that public client-side teams in energy are not as mature or capable as public client-side teams in transport, and not yet well equipped as intelligent or sophisticated procurement teams that drive value for money through competition.[114] As one stakeholder put it:

> The maturity in transmission is where road and rail was twenty years ago.

The need to accelerate the journey to maturity for transmission project procurement teams is starting to be recognised. Energy departments and agencies have recruited some people with experience in major project delivery from transport departments and agencies, and the private sector. But the pace of change is slow.

Some states have moved to co-locate delivery of different infrastructure types together in one entity, to enhance learning-by-doing and build experienced teams. NSW Public Works manages the delivery of water, civil, engineering, building and disaster recovery projects across all state agencies and local government.[115] In 2019, Victoria established the Major Transport Infrastructure Authority (MTIA) in 2019,[116] bringing together the Level Crossing Removal Authority, the Major Roads Projects Authority, North East Link Authority, Rail Projects Victoria and the West Gate Tunnel. And in 2024 it established the Victorian Infrastructure Delivery Authority (VIDA),[117] bringing the Major Transport Infrastructure Authority together with the Victorian Health Building Authority.

[112] Bent Flyvbjerg and Dan Gardner (2023)

[113] At a Commonwealth level, largely removed from project delivery, this separation takes a different form, in the limited role that the Commonwealth's infrastructure advisory body — Infrastructure Australia — plays in energy infrastructure. This issue is discussed in more detail in the next section.

[114] This observation was also made, although less often, with respect to *private client-side* procurement teams in energy— for example private TNSPs procuring transmission lines or private investors procuring generation or storage assets.

[115] NSW Public Works (2022)

[116] Department of Transport Victoria (2019)

[117] Victoria State Government (2024)

But no state has co-located transport and energy procurement to allow the lessons from one boom to inform the next, leaving energy procurement largely separate and distinct from the experienced teams that drive procurement in other sectors.

6.3 Reform area 2: Better value for money through procurement

6.3.1 Promote competition for all major infrastructure projects

> **Recommendation 5:** State governments should procure all major public infrastructure projects through a contestable process, with no automatic preference given to incumbent asset owners or first movers. This should include major transmission projects.

Competition is a crucial driving force to lowering costs,[118] and should be harnessed to contain costs in the provision of public infrastructure, including in transmission. The direct pass through of the cost of the transmission grid build to consumers through the RAB means great effort should be directed at injecting competition at the procurement stage.

Where a major transmission project has been identified, a competitive process should be undertaken to determine who builds, owns and operates it. The same party need not fill all these roles.

Existing asset owners should not be *automatically* preferred, whether they are publicly or privately owned. Existing asset owners may have some comparative advantages that allow them to build, own or operate the infrastructure in a way that delivers better value for money for consumers, but this should be tested in the market.

Even in cases where only an existing asset owner can feasibly deliver a time-sensitive project, for example one that is required to safeguard grid stability, it is prudent to test this with the market if possible.

Contestability should apply to all transmission procurement above some threshold. For example, this threshold could be set at $7 million to align with the existing threshold for minor transmission projects that are not required to go through the RIT-T process.[119]

Market-led proposals for public infrastructure should not be accepted as a matter of principle - in transmission, or any other sector. If a government is interested in pursuing a project proposal put to it as a market-led proposal, it should be tested through a transparent and open competition procurement process. For example, the Victorian Government could have tested Transurban's market-led proposal for the West Gate Tunnel through competitive process open to any infrastructure solution that would deliver additional capacity for cars and trucks to cross the Yarra river in that part of Melbourne. Whether the West Gate Tunnel offered value for money could then have been tested against alternatives, such as an augmented West Gate Bridge, or a tunnel in a different location.

[118] Policy Institute Australia (2025)

[119] Australian Energy Regulator (2026c)

6.3.2 Create professional infrastructure delivery agencies in each state

Recommendation 6: Each state and territory should create an *Infrastructure Delivery Agency* with experienced, sophisticated procurement professionals to lead major project procurement across transport, energy and social infrastructure. This could be a single agency, or a hub of multiple delivery agencies.

There is no reason to delay bringing transport procurement expertise into transmission procurement to deliver best value for money for energy consumers and taxpayers. Policy Institute Australia recommends that state governments with significant infrastructure pipelines create a single, standalone, sophisticated and mature procurement entity — an *Infrastructure Delivery Agency* — that can oversee procurement for all major public infrastructure,including road and rail, energy, and social infrastructure.

The *Infrastructure Delivery Agency* would bring together all major project procurement experience currently within state governments. It could be a single standalone entity, or a hub that brings together a number of smaller agencies or department sections. Undertaking large departmental reorganisations is not the intent of this recommendation; the intention is to create a centre of excellence to bring together expertise and work with agility.

Bringing procurement and contracting personnel together would build on past experience more rapidly than would separate, standalone agencies, with a greater number of projects being undertaken by the same teams across a range of project types. They would include a mix of capabilities, including project management, civil engineering, electrical engineering, geotechnical engineering, and strong commercial acumen. They would help governments to actively manage project risks and to engage proactively and commercially with civil contractors. Greater procurement efficiencies, such as standardisation of contracts, would benefit major project delivery in all sectors.

6.3.3 State governments should lead on community engagement for major infrastructure projects

Recommendation 7: The *Infrastructure Delivery Agency* would lead on all matters of community engagement, land access and land acquisition on all major infrastructure projects.

The *Infrastructure Delivery Agency* should take the primary responsibility for community engagement on all major infrastructure projects. This is important where project delivery requires access to, or acquisition of, private land (or easements on private land; common in transmission).

A single, accountable public entity can act as a clear point of contact for affected communities and landholders. Centralising engagement into a single entity can provide clarity over who is responsible, and reduce duplication and mixed messages.

Infrastructure Delivery Agency should build dedicated, multidisciplinary teams with the capability to negotiate directly with landholders on access, easements,

compensation and timing. These teams should also build the capability to work with First Nations people in their jurisdiction.

These teams should be embedded in the planning and procurement process early to work with the *Grid Planning Authorities* during strategic planning (including route identification); work with local transport and housing departments to inform planning and business case development; and ensure all ducks are in a row before procurement begins.

Effective community engagement would reduce the risk of significant disputes, community backlash, project delays and cost blowouts.

7 Managing capacity constraints

Capacity constraints in labour and materials will limit the effectiveness of any other efforts to contain the cost of major infrastructure projects. When too many projects are attempted at the same time, they inevitably compete for resources, pushing costs up and timelines out.

In the current environment, the planned delivery of $65 - $85 billion or more in major transmission projects is taking place in a heated civil construction market locally, and a booming transmission market globally.

7.1 Capacity constraints in civil construction

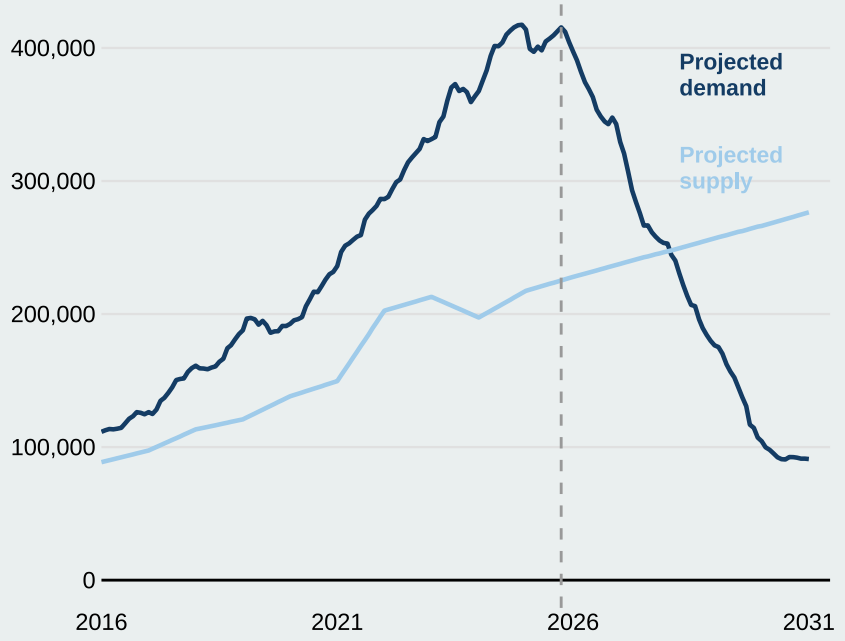
The rapid expansion of the civil construction sector over the past two decades has driven extraordinary growth in the workforce. Since 2005, the heavy and civil engineering construction workforce has increased by around 160%, far exceeding the rate of growth of the general construction workforce (around 60%) or the broader Australian workforce (48%).[120] More than 50,000 more jobs have been created in civil construction than would have been the case if the workforce had grown at the average rate across all industries.

Despite this, workforce shortages appear to persist (Figure 21). Infrastructure Australia's Market Capacity report has consistently shown shortages relative to jobs required to build all infrastructure projects in the pipeline.

[120] Australian Bureau of Statistics (2026b); Australian Bureau of Statistics (2025e)

Figure 21: Labour shortages appear to be persistent

Labour demand and supply projections, number of workers, public infrastructure pipeline



Note: Workforce *supply* projections are modelled using a variety of data sources, including the 2021 Census and ongoing Labour Force Survey as key inputs. Supply covers the workforce from all public infrastructure pipelines irrespective of the funding source. Workforce *demand* projections are modelled covering the workforce from all public infrastructure pipelines.

Source: Infrastructure Australia (2025d)

Industry stakeholders believe that workforce capacity constraints among engineers, project managers and skilled trades workers have restricted infrastructure delivery. Data from Infrastructure Australia shows these shortages have been in both professional roles and skilled trades — including civil and structural engineers, procurement officers and general labourers.[121]

Where these capacity constraints bite, projects are delayed, and costs can escalate quickly if project managers are incentivised to bid against each other for the scarce labour available. As one stakeholder suggested:

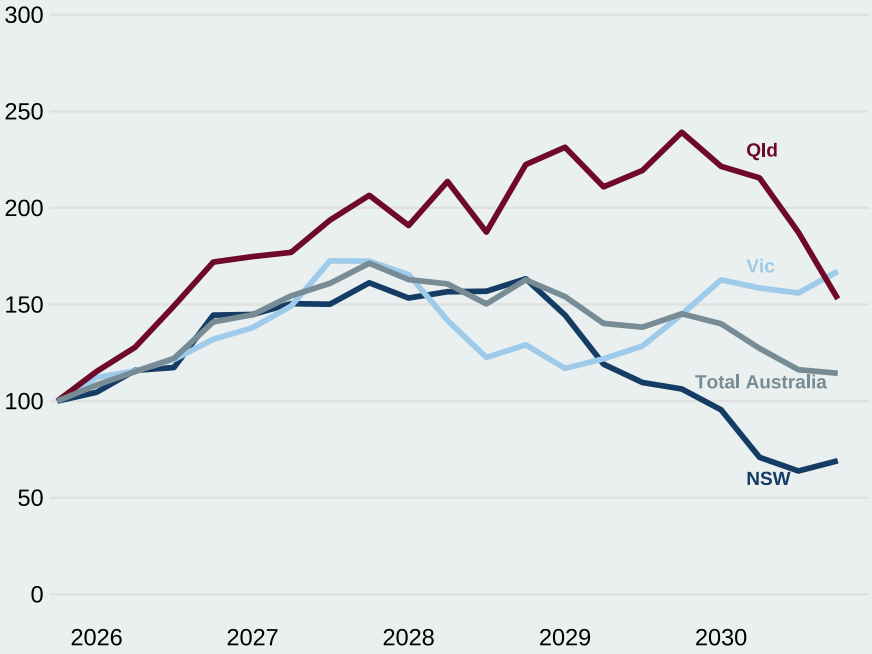
> The sector has struggled to meet the pace and size of the build required... only 80 to 85 per cent of funded works are being delivered each year.

Forecasts show labour demand is still expected to grow significantly, but will vary by state. Demand is particularly strong in Queensland as activity for the Olympics heats up (Figure 22).

Transmission construction is more capital-intensive and the workforce required is less significant than in major transport projects. As an example, a previous study conducted by AEMO projected that the transmission construction workforce would peak at between 5,000 and 7,000 in the late 2020s.[122] However, the location is critical. Workforce shortages in regional Australia — across all infrastructure types — are projected to be nearly as large as in capital cities.[123] This may create a challenge for the delivery of transmission projects, as many major energy infrastructure projects are in regional areas — including both transmission and generation projects.

Figure 22: Labour demand is expected to increase the most in Queensland

Modelled labour demand, major projects in infrastructure pipeline, indexed to 100 in Q3 2025, by state



Note: Data for the forecast was developed by Deloitte for Infrastructure Partnerships Australia. Data is drawn from the projects and contracts on Infrastructure Partnerships Australia's ANZIP website. This data has then been applied to a model which estimates each project's quarterly labour requirement across all relevant occupations using ABS employment data and labour intensity benchmarks based on the project's sector and position in the planning and delivery cycle.
Source: Infrastructure Partnerships Australia (2026)

[121] Note that professional roles related to civil construction may not show up in the 'Construction' industry for employment, as some may work in professional services. (Infrastructure Australia, 2025d)
[122] Australian Energy Market Operator (2024b)
[123] Infrastructure Australia (2025c)

7.1.1 Better construction productivity could ease shortages

Australia's construction output depends not just on the size of the workforce, but also on how much each worker produces. There is evidence that declining productivity is working against the growth in the construction workforce, leaving the sector producing less with more.

Measured productivity in Australian construction has gone backwards over the past decade, unwinding a dramatic spike up in the 2010s that was driven by private sector activity through the resources boom (Figure 23).

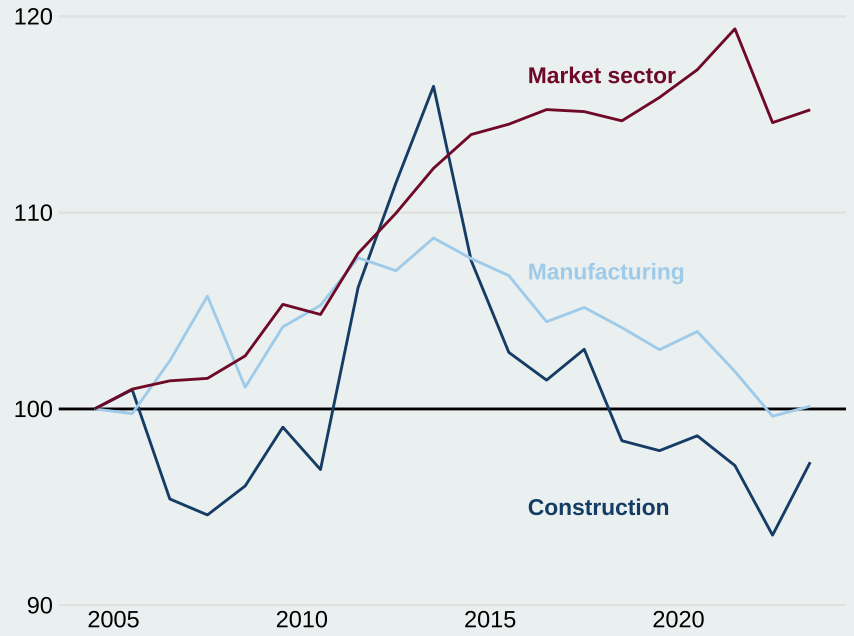
The drivers of weak productivity are subject to debate. Some stakeholders perceive that construction has not evolved with new technology, although others point to some advances in civil construction, including in tunnelling technology and the use of prefabricated concrete. Stakeholders showed enthusiasm for the opportunities that greater adoption of 'modern methods of construction' might bring.[124] Modern methods of construction is currently the topic of several reviews and government working groups.[125]

[124] Modern methods of construction is an umbrella term for construction approaches that differ from traditional, fully on-site building, typically by shifting more of the building process into controlled manufacturing settings and then transporting and assembling/installing components on site (for example prefabricated and modular systems).

[125] Department of Jobs, Skills, Industry and Regions Victoria (2025)

Figure 23: Productivity growth in construction has lagged other sectors

Productivity index, quality adjusted, hours worked basis, indexed to 100 in 2005



Source: Australian Bureau of Statistics (2026a)

7.1.2 Industrial relations in the construction sector

The link between poor productivity and industrial relations in the civil construction sector was frequently mentioned in consultations held with stakeholders for this paper. It is a fraught issue. There has been considerable public attention in recent years focused on the poor or corrupt behaviour on public infrastructure sites, particularly in relation to the CFMEU. This includes the 'Building Bad' series published by *The Age*; the Geoffrey Watson SC review, *Rotting from the Top*, into the Victorian branch of the CFMEU; and the Commission of Inquiry into the CFMEU in Queensland.[126]

Data from the ABS suggests workers in the construction industry tend to work long hours. The ABS reports that 18.2% of construction industry workers worked 50 hours or more per week, compared to 11.1% for all workers.[127] One study found that more than half of all workers on major horizontal infrastructure projects (i.e. road and rail) worked longer than 45 hours per week.[128]

At the same time, anecdotes illuminate where the data on hours worked in construction may be limited.

Stakeholders consulted for this paper estimated that the proportion of time spent 'on-the-tools' for some major project sites was around 3.5 days a week, and sometimes as low as 3 days a week. In other words, a worker employed for a 5 day working week was typically spending 1.5 of those days *not* 'on-the-tools'.[129]

These anecdotal estimates roughly accord with the findings of the Queensland Productivity Commission's inquiry into construction productivity, which estimated that the 'Best Practice Industry Conditions' (BPIC) introduced in 2018 led to some work sites in Queensland 'struggling to operate more than three days per week'.[130]

Key conditions of BPIC included specified penalty rates and allowances for different tasks; 26 fixed Rostered Days Off (RDOs) requiring full site closure; explicit stop work conditions related to inclement weather conditions; and union approval for any changes to rosters, hours of work, or the use of subcontractors.[131] BPIC was introduced through the Queensland Government Procurement Policy and applied to major Queensland Government construction projects valued at $100 million or more, or on declared projects such as school buildings at around $20 million.[132] The policy was suspended in October 2024.[133]

Stakeholders universally emphasised the important role of unions in protecting workers and advocating for their safety. Construction sites are among Australia's most dangerous workplaces. The rate of workers' compensation injury claims per million hours worked is more than 40% higher in civil construction than across the economy as a whole.[134]

The application of workplace health and safety rules is a key mechanism through

[126] The Age (2026); Geoffrey Watson SC (2025); Queensland Government (2026)
[127] National Construction Industry Forum (2025)
[128] Construction Industry Culture Taskforce (2025)
[129] The gap is partly explained by sick days, rostered days off (RDOs), and 'weather rules' where work is stopped due to wet or hot weather.
[130] Queensland Productivity Commission (2025)
[131] Queensland Productivity Commission (2025)
[132] Queensland Productivity Commission (2025); Queensland Government (2024)
[133] Queensland Government (2024)
[134] Not all work-related injuries and illnesses result in a claim for workers compensation. (Safe Work Australia, 2025)

which workers' health and safety is protected.

But some stakeholders expressed concern that 'stop work' provisions under workplace health and safety (WHS) rules have been triggered for spurious reasons, including to advance bargaining positions related to other work sites or to slow the pace of delivery while waiting for another project to commence.

The incidents are similar to the October 2025 reports of the CFMEU, Electrical Trades Union and plumbers' union shutting down construction on the West Gate Tunnel based on claims of safety concerns with a lack of evacuation exits. On the same day, the CFMEU was reported to have pulled workers from other projects, including the Metro Tunnel. The AFR reported that "union sources… were expected to continue until John Holland withdrew its deal with CFMEU-rival the Australian Workers' Union for SA's $15 billion Torrens to Darlington tunnel project."[135]

Where it occurs, poor labour productivity resulting from these workforce practices puts a limitation on the output of a growing workforce.

The Queensland Productivity Commission found that, if BPIC had remained in place until 2029-30, project costs would be around 10% to 25% higher. It also found that the continuation of BPIC would result in 26,500 fewer homes being constructed over the period due to the flow of labour from residential to civil construction, and because of the flow-on effects of working conditions from civil to high rise construction.[136]

[135] Australian Financial Review (2025a)
[136] Queensland Productivity Commission (2025)

In mid 2024, the New South Wales Productivity and Equality Commission conducted an inquiry to identify factors impacting the supply of new housing in NSW. The Commission cited the "crowding out" effect of the Government's major project pipelines, reducing overall sector capacity and bidding up costs for labour and materials as the pipeline of public sector work increased by nearly 40% post-COVID.[137]

The report found that 30,000 construction workers would be needed in NSW to meet the National Housing Accord targets, and another 96,000 required to meet the infrastructure pipeline— growth that cannot be achieved.

Policy Institute Australia estimates that a labour productivity improvement of 10% in civil construction could free up around 4,000 workers in 2026, and more going forward. If achievable, this would go some way toward meeting the needs of Australia's transmission build.[138]

7.2 Global competition for transmission inputs

Labour has been a key constraint in major transport construction, but material inputs are also important for the future transmission build.

Infrastructure Australia surveys industry participants about supply chain risk factors. In its 2025 survey, industry organisations highlighted supply of timber and timber products (38%), steel or steel products (32%) and concrete or

[137] NSW Productivity and Equality Commission (2024)
[138] Policy Institute Australia analysis. This assumes a 10% increase in productivity would achieve a 3% fall in employment, relative to a civil construction employment base of 120,000 (Australian Bureau of Statistics, 2026b). This is based on research of the relationship between productivity and employment in Autor and Salomons (2017).

cement (28%) as a 'major' or 'significant' 'threat to successful delivery'.[139]

However, the key material inputs for *transport* infrastructure are mostly widely available — either as traded commodities — such as steel and steel products, or fuel and oil products such as bitumen — or high volume low value locally-produced materials such as sand, rock and other quarry products.

This is not the case for transmission.

High-voltage transmission infrastructure requires highly specialised inputs such as large power transformers and cables. Large transformers are often engineered-to-order and are supplied by a relatively small set of global manufacturers with finite production slots.

Globally, grid expansions are accelerating as countries around the world pursue an energy transition. The International Energy Agency reports that procurement times for essential components such as large power transformers and cables have almost doubled since 2021, and that it can now take up to four years to secure large power transformers (with some specialised components taking even longer). The IEA also report that since 2019 prices for cables have nearly doubled, and the price of power transformers rose by around 75% (both in real terms).[140]

AEMO has explicitly flagged 'supply chain constraints and global competition for electricity infrastructure assets' as factors pushing up transmission cost estimates and stretching delivery timelines.[141] And because Australia is a comparatively small buyer in global terms, and the Australian landscape is fragmented, local buyers are often competing for purchase orders against much larger order books in the Northern Hemisphere.

These global factors are to some extent outside the control of Australian clients and contractors. But having fewer entities responsible for procuring transmission infrastructure — as Policy Institute Australia recommends above — could help, as could greater coordination between these entities.

7.3 Capacity should inform pipelines

Australia's size and geographic remoteness limit our ability to rapidly ramp up construction capacity to meet demand. A pipeline of infrastructure megaprojects that is too large will have the effect of pushing up costs when our supply capacity cannot expand rapidly enough to meet it.

Understanding the capacity of the market to supply labour and materials for major projects is essential. Though the need for new infrastructure may be significant, failure to recognise supply constraints and therefore to prioritise projects will result in greater cost, not greater output. Efforts to address supply constraints can and will be made, but experience shows progress is usually limited. An approach that manages the pipeline to the capacity that exists to deliver it will help contain the costs of the pipeline overall, and each project within it.

[139] Infrastructure Australia (2025c)
[140] International Energy Agency (2025)
[141] Australian Energy Market Operator (2023)

7.3.1 The role of states in transmission pipeline management

As discussed, states and territories are primarily responsible for selecting and delivering major public infrastructure projects, across most sectors. Capacity constraints therefore must be understood and managed at the state and territory level. This includes the labour force.[142]

Pipeline management ideally happens prospectively. However, the ability of states and territories to select which transmission infrastructure projects go ahead, and when they proceed, is limited (as detailed in Chapter 5).

This is not ideal, particularly given the constant change in the energy landscape. Transmission build costs have risen rapidly, for reasons discussed above. There have been significant price changes in other substitute and complementary technologies, which changes an optimal or lowest cost grid transition pathway. Indeed, the lead role that AEMO and the ISP have taken in driving selection of transmission projects has arguably reduced states' authority, willingness and accountability to defray transmission costs by finding latent capacity within their own state system.[143]

Currently, it is AEMO that appears to be managing the transmission pipeline. The most recent Draft 2026 ISP materially revised down the projected volume of new transmission lines required to be built by 2050, from 10,000km down to 6,000km. This reflected changes in government policy, but also in market conditions and the resulting costs.[144]

This shows some flexibility, although AEMO does not appear to have shown willingness to revisit whether projects that are already in train should be stopped or paused, even where the numbers change dramatically.

The situation is further complicated by the role of TNSPs and other private project proponents, who reasonably seek certainty that projects that they have spent time and money progressing will go ahead. These projects are particularly susceptible to sunk-cost bias, where project proponents (and perhaps others in the decision-making chain) remain committed to completing the project even if it no longer stacks up based on the future benefits and costs not yet incurred.

Because of the speed with which things are changing in this space, a more flexible approach is needed, including a willingness to ignore (and perhaps wear) sunk costs in decisions around project selection and timing.

Having a single infrastructure delivery agency would give that one entity broad visibility over labour market capacity constraints. This data could then inform aggregate pipeline data, shared across all state and territory governments.

7.3.2 The Commonwealth's coordinating role

The Commonwealth also has an important role to play in coordinating the national infrastructure pipeline, especially where projects are likely to need specialised or management expertise. As one stakeholder told us:

[142] Construction workers move between regional labour markets at a similar rate to the rest of the economy, at around 3%. Productivity Commission (2014a)

[143] Discussion with industry stakeholders.

[144] The 6,000km is the current estimate, but could be more when considering smaller projects not captured in the ISP or future changes to investment. See Appendix A for more detail.

> It's madness that we've been building a metro in Sydney and a metro in Melbourne at the same time.

The Commonwealth influences states' infrastructure programs through the power of the purse, as a discretionary funder of major projects. Of course, this does not necessarily determine the course of action by state governments. The Victorian Government pressed on with the Suburban Rail Loop even when the former Coalition Government in Canberra refused to provide any funding (Box 3).

The nature of Australia's federation and experience of poor state coordination left many stakeholders interviewed for this project skeptical of the Commonwealth's ability to influence the national pipeline. Political incentives for state and territory governments to press ahead with major projects remains strong.

But the Commonwealth *can* have sway. The incoming Albanese Government commissioned an Independent Strategic Review of the Infrastructure Investment Program in May 2023, which assessed a long list of infrastructure projects that the former Coalition Government had provided funding for.[145]

> The impetus for the Review, as set out by the Minister, was that the IIP contained a large number of projects which did not have sufficient funding or a strong enough business case to justify Australian Government investment. This has led to a clogged infrastructure pipeline that does not reflect current market capacity ...

[145] Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts (2023)

The Review led to a minor re-shaping of the infrastructure pipeline to account for market capacity, with some projects cancelled or delayed.

In the case of transmission, the magnitude of the $65-$85 billion cost combined with the NEM states' fiscal capacity to pay and a combined desire to use government balance sheets to defray the pass through of costs to electricity consumers gives the Commonwealth a wide opening to influence outcomes.

7.3.3 Infrastructure Australia's role in pipeline and capacity coordination

Infrastructure Australia already plays a role in supporting coordination to manage the national infrastructure pipeline. Infrastructure Australia was established in 2008 to create an independent agency that would plan and prioritise major infrastructure investment across the nation, based on merit. A number of states also created their own infrastructure bodies.

Infrastructure Australia produces the Infrastructure Market Capacity Report, introduced in 2021.[146] The report provides transparent, open information on labour, materials and sectoral capacity constraints for major infrastructure projects. This has helped develop a national view of demand and supply for major project construction. For their part, many state and territory governments report internally on capacity constraints for major projects.

A 2022 Independent Review of Infrastructure Australia noted some benefits coming out of the role of Infrastructure Australia, particularly that since 2011

[146] The Market Capacity Report was introduced to respond to a request made by the Prime Minister and First Ministers at COAG in March 2020.Infrastructure Australia (2021)

states and territories 'have all moved to put in place more effective and transparent investment plans, business cases, and project development and project assurance processes'.[147]

However, the 2022 review also concluded that Infrastructure Australia's ability to 'inform and influence the Government on infrastructure matters has waned'. A subsequent review of the Infrastructure Investment Program noted poor quality spending, with 'a larger number of projects which did not have sufficient funding or a strong enough business case to justify Australian Government investment'.[148]

The 2022 Review led to significant reform of Infrastructure Australia in mid-2024, to strengthen its voice within the Commonwealth Government's investment decision making process, including through the annual budget process.

Infrastructure Australia's role in reviewing business cases and providing advice to the Commonwealth Government is set up in part to improve infrastructure decision making by the states. One prominent example was Infrastructure Australia's assessment that business case materials provided by the Victorian Government on the Suburban Rail Loop were not up to scratch.

Whether Infrastructure Australia's role evolves to have greater influence on infrastructure investment decisions remains to be seen. At the end of the day, ministers will always retain the right to make investment decisions that they deem to be in the national interest. Despite Infrastructure Australia's view of the Suburban Rail Loop business case, the Prime Minister announced new funding (Box 3).

Infrastructure Australia has played a limited role in energy infrastructure (although its focus has shifted more to energy over the last year),[149] though its current Statement of Expectations (and many former versions, dating back to 2014) name 'energy' as one of the sectors it may consider.[150]

7.4 Reform area 3: Pipeline and capacity management

7.4.1 States should assess the projects in their transmission pipeline

> **Recommendation 8:** State transmission planning entities should undertake scheduled, formal reviews of their transmission pipeline to reassess project scope, timing and sequencing. All NEM states undertake cost benefit analysis of all major transmission projects over the next 12–24 months to determine if projects remain justified.

The benefits and costs of various transmission projects are regularly (and in recent times, dramatically) changing. Detailed cost benefit analysis and regular reviews of the pipeline are thus needed to ensure that the right projects are being undertaken at the right time.

[147] Infrastructure Australia (2019)
[148] Productivity Commission (2014b)
[149] As an example, Infrastructure Australia has recently expanded its work on enabling infrastructure to support the transition to renewable energy sources, such as the ability of ports and roads to facilitate the transport of key components, such as the huge blades of wind turbines (Infrastructure Australia, 2025b;Infrastructure Australia, 2025a)
[150] Infrastructure Australia (2024b)

State and territory transmission planning agencies should do this by reviewing market factors and the merits of each project. Cost benefit analysis should be updated with potential to delay or defer projects where the expected benefit-cost ratio no longer stacks up.

These reviews should aim to overcome sunk-cost bias in decision making. State and territory governments are the right entities to determine which projects meet the public interest test for progression, including the sometimes tough decision to delay or abandon projects.

7.4.2 Expand Infrastructure Australia's role

Recommendation 9: Infrastructure Australia's remit should be expanded to evaluation of major energy infrastructure project business cases. Infrastructure Australia should assess business cases for any major infrastructure project that receives a Commonwealth investment of $250 million or more, whether provided through grant, debt, equity, or another funding mechanism. To enable this, the Commonwealth should revise Infrastructure Australia's Statement of Expectations and, where necessary, secure agreement from state and territory Energy Ministers.

Infrastructure Australia's focus is on 'significant infrastructure', meaning it evaluates infrastructure proposals that 'are nationally significant or where Commonwealth funding of more than $250 million is sought'.[151]

However, while Infrastructure Australia has published energy-focused analysis previously, it does not typically evaluate significant energy infrastructure projects, even though many big transmission projects would meet this definition. This is despite its role under the *Infrastructure Australia Act 2008* (Cth) is to act as Australia's independent adviser on nationally significant transport, water, energy, and communications infrastructure.[152] And, as noted above, its Statement of Expectations names 'energy' as one of the sectors it may consider.[153]

Infrastructure Australia provides independent advice. Other Commonwealth agencies involved in energy projects — such as the Clean Energy Finance Corporation (CEFC), the Australian Renewable Energy Agency (ARENA), or the Northern Australia Infrastructure Facility — tend to assess projects with a commercial lens. In contrast, Infrastructure Australia approaches projects with an economic assessment to determine whether or not they are in the best interests of the Australian public.

Infrastructure Australia's role should be expanded so that it can evaluate all major infrastructure projects with a Commonwealth contribution above a value of $250 million, including energy projects. This should include projects funded through mechanisms other than grants, such as through debt or equity funding, and include support provided by dedicated funds or agencies such as the CEFC or ARENA. If this policy had been in place historically, it would have meant that Infrastructure Australia was empowered to publish an assessment on the

[151] Infrastructure Australia (2024b)

[152] Infrastructure Australia (2025f)

[153] Infrastructure Australia (2024b)

Commonwealth Government's equity stake in Snowy 2.0 and the roll-out of the Rewiring the Nation fund. Infrastructure Australia should be resourced to undertake this expanded role.

Commonwealth, State and Territory Energy Ministers (through the Energy and Climate Change Ministerial Council) should resolve to endorse this expanded role in energy.

7.4.3 Collect productivity data for civil construction

> **Recommendation 10:** Expand the role of Infrastructure Australia to gather and publish labour productivity metrics across all publicly funded major infrastructure projects consistent with their work on the Infrastructure Market Capacity Report.

Currently, major project procurement agencies lack a reliable and trustworthy evidence base on on-site productivity on major civil construction projects.

This shortfall has been recognised by governments across Australia, who are working together through the Infrastructure and Transport Senior Officials' Committee (ITSOC) to 'establish measures to assess and track productivity performance'.[154]

Infrastructure Australia should be tasked to work with the States and Territories to establish, collect and publish a new Major Projects Productivity Dataset, and should be resourced to do so.

The aim of the dataset would be to inform government policy and project-level decision making aimed at lifting the sector's productivity. It would help governments plan better, understand the reasons for poor (or strong) project performance, and to learn from past mistakes.

Data should be collected at a project-level, using standard definitions and fields to allow for benchmarking and comparison across comparable projects, and states, and over time. The scope of the dataset would be determined by Infrastructure Australia after a period of consultation, but could include data such as: labour costs; working hours; overtime; work stoppages including for workplace health and safety, industrial action, RDO provisions; and appropriate measures of output such as value of work completed.

The requirement to provide this data should be included as a term in all government contracts above a defined threshold.

Infrastructure Australia should regularly publish insights on major project productivity to enable policymakers to identify system-level trends in major infrastructure delivery. This should include benchmarking across states and project types, as well as analysis of recurring constraints and issues that lead to productivity loss.

Detailed data should also be made available to state and territory governments (including procurement teams) and to researchers under standard data protection protocols. Providing data that practitioners can use to improve poor labour productivity represents a significant opportunity to expand Australia's capacity to deliver our pipeline of critically important national infrastructure.

[154] Infrastructure Australia (2025c)

A Transmission data and methods

Step 1: Collating a transmission infrastructure database

Policy Institute Australia collated data for the transmission infrastructure pipeline from the projects listed in AEMO's Draft 2026 ISP. This included all seven committed and anticipated projects already underway; twelve actionable (or likely to be soon) projects; and seven future ISP projects.

Policy Institute Australia created a taxonomy to communicate these project groupings.

- Projects that are '*not contracted*' are those that are defined by AEMO as being in one of three categories: likely to remain actionable; actionable in 2024 but require ongoing analysis; or future ISP projects.
- Projects that are '*contracted, not delivered*' are those defined as being committed or anticipated projects by AEMO.[155]

Project costing

The projects that were listed by AEMO as actionable or future ISP projects were estimated by AEMO in 2025 dollars, in many cases with 30–50% error bands.

The 2026 ISP did not include the latest cost estimates for projects that were listed by AEMO as either committed or anticipated, as these were considered sunk costs. To find cost estimates and adjust into $2025 for comparison, Policy Institute Australia found the latest reputable cost estimate information (for instance, from the AER or the project proponent or state government website) and adjusted using ABS consumer price inflation data. We assumed future CPI growth of 2.5%, the middle of the RBA's target band.[156]

Policy Institute Australia has deliberately rounded cost estimates for presentation purposes throughout this report, and, as a result, data across tables and figures may not match exactly. This was done given the considerable uncertainty, and constant changes, around cost estimates for transmission projects.[157]

Project timing

The expected timeline for all projects was the 'full capacity timing advised by proponent' or 'earliest feasible full capacity timing', acknowledging that many of these dates are subject to change. This represents only some of the transmission network projects that may occur over the next decade. Industry observers noted that some additional works to build transmission infrastructure within REZs, or additional projects being undertaken by TNSPs, including for system strength, are not captured in this database.

[155] Committed projects meet all of AEMO's commitment criteria, including site acquisition, components ordered, planning approvals, finance completion and set construction timing. Anticipated projects meet at least three of these five criteria.

[156] This was also done to calculate the real increase in the expected transmission investment. This was done by finding the first time a project was listed in either the ISP, or a public announcement, and adjusting that data into real $2025 for comparison.

[157] Data for the total cost of the transmission infrastructure pipeline is presented as a range, from $65 billion to $85 billion. The lower bound is calculated as $67 billon and represents the middle range of the cost estimates provided by AEMO. The top range is calculated as $83 billion and shows the top of AEMO's error band.

Table 2: Major east-coast transmission projects, Integrated System Plan

Project	Status	Full capacity*	State	$m (2025)
Project EnergyConnect – NSW section	Committed (contracted)	2027	NSW	3,842
HumeLink	Committed (contracted)	2027	NSW	4,232
Central-West Orana REZ Network Infrastructure Project	Committed (contracted)	2028	NSW	5,006
Hunter–Central Coast REZ Network Infrastructure Project	Anticipated (contracted)	2028	NSW	604
Western Renewables Link	Anticipated (contracted)	2029	Vic	1,567
Facilitating Power to South East Queensland	Future ISP projects	2029	Qld	33
Western Victoria Reinforcement	Likely to be identified as newly actionable	2029	Vic	128
Switching Station near Wodonga	Likely to be identified as newly actionable	2029	Vic	220
Sydney Ring North (Hunter Transmission Project)	Likely to remain actionable	2029	NSW	1,364
Gladstone Project	Likely to remain actionable	2029	Qld	2,367
Northern Transmission Project (Mid North SA REZ Expansion)	Require ongoing analysis	2029	SA	620
Project Marinus – Stage 1**	Anticipated (contracted)	2030	Vic / Tas	4,357
Sydney Ring South – power flow control option	Likely to remain actionable	2030	NSW	261
Waddamana to Palmerston transfer capability upgrade	Likely to remain actionable	2030	Tas	224
CopperString 2032	Anticipated (contracted)	2031	Qld	13,900
Central-West Orana REZ Expansion	Future ISP projects	2031	NSW	855
Facilitating Power to Central Queensland	Future ISP projects	2031	Qld	209
Gippsland Offshore Wind Transmission	Likely to be identified as newly actionable	2031	Vic	2,690
VNI West	Likely to remain actionable	2031	Vic / NSW	7,600
Central Queensland to Southern Queensland Expansion	Future ISP projects	2032	Qld	3,810
Eastern Victoria Reinforcement	Future ISP projects	2032	Vic	350
New England REZ Network Infrastructure Project	Likely to remain actionable	2032	NSW	3,673
Sydney Ring South – 500kV option	Future ISP projects	2034	NSW	2,360
South West Victoria Expansion	Future ISP projects	2034	Vic	1,330
Project Marinus – Stage 2	Likely to remain actionable	2034	Vic / Tas	2,535
Queensland–New South Wales Interconnector (QNI Connect)	Require ongoing analysis	2034	Qld / NSW	2,989

Note: *Full capacity year is the earliest date the project is expected to be complete and running at full capacity (as advised by the proponent). For Gippsland Offshore Wind Transmission, the project will be delivered in stages, with Stage 1 by 2031, Stage 2 (Phase 1) by 2033 and Stage 2 (Phase 2) by 2038. **Project Marinus Stage One represents the amount approved by the AER to enter the RAB by 2030.

Source: Australian Energy Market Operator (2025b); Transgrid (2025); Australian Energy Regulator (2024b); Energy Corporation of New South Wales (2024); Energy Corporation of New South Wales (2025b); Australian Energy Regulator (2025d); PricewaterhouseCoopers (2025); Australian Energy Regulator (2026b); Infrastructure Partnerships Australia (2025b).

Table 3: Transmission project cost estimates have repeatedly been revised upwards

Project	2020 ISP ($2019)	2022 ISP ($2021)	2024 ISP ($2023)	2026 ISP ($2025)	Latest estimate
Project EnergyConnect (NSW section)	$1,990m (±30%)	*Anticipated*	*Committed*	*Committed*	$3,600m ($2023)
HumeLink	$2,100m (±30%)	$3,315m	$4,892m (-5% to +12%)	*Committed*	$3,945m ($2023)
Project Marinus Stage 1	$1,845m (±30%)	$2,380m (±30%)	$3,800m (±30%)	*Anticipated*	$4,930m ($2030 nominal)
Project Marinus Stage 2	$1,310m (±30%)	$1,400m (±30%)	$2,700m (±30%)	$2,535 (±30%) ($2023)	—
VNI West	$2,410m (±30%)	$2,991m	$3,600m (±30%)	$7,600m (-30% to +50%)	—
New England REZ Network Infrastructure Project	—	$1,900m (±50%)	$3,700m (±50%)	$3,673m (±50%)	—
Central-West Orana REZ Network Infrastructure Project	$650m (±30%)	*Anticipated*	*Anticipated*	*Committed*	$5,526 ($2029 nominal)
Queensland–New South Wales Interconnector (QNI Connect)	—	$1,253m	$2,518m (±50%)	$2,989m (±50%)	—

Note: All data presented above is as found in AEMO's ISP or other public reports and has not been adjusted; as a result, it may differ slightly from presentation elsewhere in this report.

Source: Australian Energy Market Operator (2020); Australian Energy Market Operator (2022); Australian Energy Market Operator (2024a); Australian Energy Market Operator (2025b); Transgrid (2025); Australian Energy Regulator (2024b); Australian Energy Regulator (2026b); Australian Energy Regulator (2025d).

Step 2: Estimated impact of projects on the RAB

To estimate the impact of new transmission projects on the RAB for transmission of the NEM, Policy Institute Australia used the current estimated cost of projects (as a proxy for asset value) and compared this with the current, and historic, value of the RAB across the NEM states of New South Wales, Victoria and Queensland.

Policy Institute Australia took the historic value of the NEM transmission RAB from the AER's 2007 State of the Energy Market report for the TNSPs in each state. Valuations were converted into 2025 constant dollars using ABS consumer price inflation data.

Contemporary data was collected for 2025 using the AER's 2025 State of the Energy Market report.

The value of the RAB for 2035 was projected using the data collected in our database for individual transmission projects. This assumes that all projects were complete by around 2035, based on the earliest feasible full capacity timing. Policy Institute Australia acknowledges that there is considerable uncertainty around the completion timing, and many projects may be delayed or pushed back further. The analysis is intended to estimate the potential impact on the size of the RAB if projects are completed under current projected timeframes.

In the case of projects that were split across multiple jurisdictions, a weighting was applied to map the value to each jurisdiction. Specifically:

- Project Marinus Stage One was 72.4% in Victoria and 27.6% in Tasmania [158]
- VNI West was assumed to be 50% each in NSW and Victoria.
- QNI Connect was assumed to be 50% each in Queensland and NSW.

For each project, the expected capital cost estimate is assumed to be added to the RAB. As noted above, there is considerable uncertainty around these cost estimates. The value added to the RAB may come in much higher for projects that are still in the earlier phases of developments. Some projects may not be completed and may not be added to the RAB.

We also acknowledge that the expected value ascribed to the RAB does not take into account depreciation of existing assets or potential other investment by TNSPs that will also affect the future value of the grid's asset base.

Step 3: Estimated impact on consumer bills from increases in the RAB across the NEM

As capital costs grow and are recouped through growth of TNSPs' approved RAB, consumers (as well as businesses) will pay more for transmission.

Policy Institute Australia estimated how the $65 billion to $85 billion in forecast capital expenditure would flow through to electricity bills for consumers using two different conceptual approaches. The first approach is a top-down estimated annual cost per household, using the return on capital and depreciation a TNSP may be expected to earn from the increase in the RAB, scaled for the number of households in each state. The second approach looks

[158] Australian Energy Regulator (2025c)

at how much electricity a household consumes, on average, in different states, and estimates how an increase in the transmission component of a bill would translate into the total cost of the bill on an annual basis.

These two approaches yielded broadly similar results, and the overall approach and findings were tested with a number of stakeholders throughout the discussions for this paper.

A summary of results, by state, is outlined in Table 4.

Table 4: Summary — estimated impact of transmission investment on households

Metric	NSW	Vic	Qld
Estimated cost impact ($, per household, 2035)	$522.9	$348.0	$628.4
Estimated change for a residential electricity bill (%)	20%	19%	25%

Note: See approach 1 and approach 2 detail below for more information on the methodology.
Source: Policy Institute Australia analysis (Australian Energy Regulator, 2025c; Australian Bureau of Statistics, 2023); The Australia Institute (2018); Australian Energy Market Commission (2025b))

Caveats on methodology and estimates

Important caveats to note are outlined below:

- All cost estimates are limited to the impact of the network component of the bill only. They do not consider the impact of the energy transition on other bill components, for example wholesale electricity prices. This means they are a gross impact, not a net impact. Energy market modelling was not conducted for this paper, so second order effects of transmission investment, including changes to the generation mix, are not captured in this analysis. The intent of the analysis is to show the scale and importance of the transmission infrastructure projects underway, for a 'typical' Australian household and small business.
- We did not estimate the impact on industrial customers, given the wide variation in arrangements for very large electricity consumers.
- The impact of various government funding schemes for transmission projects, including concessionary finance through Rewiring the Nation, and other direct grants provided by state governments to projects, were acknowledged but not accounted for in estimates of the future value of the RAB or on consumer prices. There is uncertainty as to the quantum impact these financing arrangements will have for the return on capital for transmission projects.
- Complexities in how different electricity charges are packaged up by electricity retailers, as well as differences by state, were not accounted for in this analysis. In particular, retailers may vary approaches to passing through network charges to consumers, which depends on the tariff types in use by the DNSPs. For example, more than half of residential customers are estimated to be on 'flat tariffs', which are fixed charges per day *and* per volumetric kWh of consumption; one-quarter on 'Time of Use' charges that have fixed daily and volumetric charges, but that also vary by time of day and/or season; and others on other different models. Across all users, analysis from the AEMC found that 'residential consumers are mostly paying for network costs volumetrically', with around 59% of cost recovery

based on the quantity of energy imported via their network connection.[159]

- We did not consider the potential impact that the capital expenditure would have on operating expenditure, and how that would be recovered from consumers.

Approach 1 — Top-down estimate

The first approach is a top-down mechanism that shows, in simple terms, how additional transmission spending will be paid for on a per household basis. This estimates the total additional revenue TNSPs in the NEM will earn on a higher value RAB, and divides the total by the number of households in the NEM. For simplicity, we have calculated the expected impact on households once all projects are completed, but, have not adjusted for the timing of when these projects will finish.

We start with the assumed increase in the RAB in each state, which is the total value of projects, in $2025. That capital is then assumed to earn a regulated return of 5.36% (nominal WACC), based off a recent regulatory decision by the AER for Project Marinus Stage 1[160], with a further 2% assumed to account for depreciation.[161] Together, this implies an annual revenue requirement of 7.36% of the added RAB.

Applying that rate to the incremental asset base gives an estimate of the additional network revenue to be recovered in 2035 — represents around $2.0 billion in NSW, $1.6 billion in Queensland and $1.1 billion in Victoria. Dividing that revenue across the estimated number of households in each state provides an indicative per-household impact.[162]

Table 5: Approach 1 assumptions and results

Metric	NSW	Vic	Qld
$bn added to RAB	$27.51	$15.08	$21.81
Return on capital (nominal WACC)	5.36%	5.36%	5.36%
Depreciation	2%	2%	2%
Revenue ($bn)	$2.03	$1.11	$1.61
Revenue per household ($, 2035 households)	$522.9	$348.0	$628.4

Note: Revenue in 2035 is calculated as added RAB multiplied by the allowed return (5.36%) and depreciation (2%), implying a total annual revenue requirement of 7.36% of the incremental RAB. Revenue per household is derived by allocating state revenue across the number of households in each state.

Source: Policy Institute Australia analysis (Australian Energy Regulator, 2025c; Australian Bureau of Statistics, 2023)

Approach 2 — Bottom-up estimate

The second approach is a bottom-up look based on the expected annual usage of a residential consumer or small business and latest electricity billing data.

Firstly, to determine the typical share of a resiential bill that is attributed to transmission, data was collated for the 2024-25 default market offer for residential customers without controlled load in Queensland and New South

[159] Australian Energy Market Commission (2025a)

[160] Australian Energy Regulator (2025c)

[161] This assumes straight line depreciation with a useful life of 50 years for transmission assets, on average.

[162] Projections for the number of households were done for 2035 using ABS Census data and ABS Population Projections data, assuming 2.5 people per household.

Wales, from Energex, Ausgrid, Endeavour Energy, and Essential Energy.[163] This included data on the default market offer, retail margin, network cost, wholesale cost, environmental cost, and retail cost. The network cost was split into transmission and distribution based on the relative share of transmission and distribution assets in the RAB.

The default market offers provide an estimate for a 'typical residential customer' based on the average of default market offers experienced by these households. This included an estimated $200 transmission cost (as part of the network cost) for a consumer on a default market offer of just over $2,100 per year. Alternatively, transmission costs represented around 9% of total costs for a residential customer. (This was assumed to be largely similar for businesses, too.)

Next, we estimated the potential impact of transmission capital expenditure on the *network cost* of an electricity bill, by scaling the transmission cost component by the expected increase in the RAB in each state. As an illustration, if the typical transmission component of a bill is $200, and the value of the RAB triples, the assumed transmission component of a bill would move from $200 to $600 and increase the total cost of an electricity bill by 19%.

To convert to dollar impact by state we drew on survey data on average annual electricity consumption data in Victoria, NSW and Queensland.[164] We used recent AEMC residential price trends for 2025 to determine residential electricity prices paid for in c/kWh for consumers in each state. Then, we scaled the expected cost of electricity by the size of the increase in the RAB in each state (refer to earlier sections). This yielded results of around a $600 increase in electricity costs for residential consumers in each of Victoria, NSW and Queensland.[165]

A similar approach was taken to estimate the impact of a business consuming up to 100,000 kWh of electricity per year, where the cost of electricity could rise up to $10,000 per year.[166]

Table 6: Approach 2 assumptions and results

Metric	NSW	Vic	Qld
Change in RAB	24%	35%	25%
$/kWh	0.4	0.33	0.39
Annual energy consumption (kWh)	6,555	5,473	6,450
Average bill – today	$2,622	$1,806	$2,516
Average bill – 2035	$3,244	$2,432	$3,183
Change	$622	$626	$623

Note: Estimated bill impacts are calculated by allocating incremental transmission revenue across electricity households in each state and dividing by average annual household electricity consumption. Source: Policy Institute Australia analysis (The Australia Institute, 2018; Australian Energy Market Commission, 2025b)

[163] The default market offer is described by the AER as an 'electricity price safety net that protects consumers from unjustifiably high prices'.

[164] Note that this data is from 2012. (The Australia Institute, 2018)

[165] This approach did not adjust for population changes, like in the first approach. The impact of population growth is likely to reduce the impact by roughly 11% across the states.

[166] The upper threshold for a small business customer is listed in regulation 7 of the National Energy Retail Regulations and is set at 100 MWh (or 100,000 kWh) of electricity per annum. (Australian Energy Regulator, 2025b)

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