

Author

Global **Transmission** Report

Knowledge Partner

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AUSTRALIA'S ELECTRICITY GRID IN TRANSITION



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INTRODUCTION

Australia's energy transition is entering a decisive delivery phase, with the electricity system undergoing simultaneous transformation on both the supply and demand sides.

On the supply side, renewables are being deployed at scale, now supplying over 40 per cent of electricity in Australia's two largest grids – the National Electricity Market (NEM) and Western Australia's South West Interconnected System (SWIS)¹. This growth reflects the country's abundant renewable resources, alongside sustained policy momentum.

Australia has ambitious decarbonisation commitments – sourcing 82 per cent of electricity from renewables by 2030 and achieving net zero emissions by 2050. Consumer energy resources, such as rooftop solar, are also surging, now installed on over a third of Australian homes and supplying around 11 per cent of the nation's electricity generation². As a result, the electricity system is becoming more bidirectional, with households increasingly generating, storing, and exporting electricity to the grid.

The rapid expansion of renewables is bringing more geographically dispersed generation, greater variability, and new requirements for system strength and inertia. Integrating this growing volume of renewable energy demands significant expansion and reinforcement of transmission networks while maintaining system resilience and security.

On the demand side, electricity consumption is entering a period of renewed growth as transport electrification accelerates and households and industries transition away from gas and other fossil fuels. In the NEM, demand is expected to almost double from 205 TWh

in 2025 to 389 TWh by 2050³. Energy-intensive sectors, including mining, advanced manufacturing, and data centres, are adding new large, concentrated loads, often in regions already constrained by network capacity. Collectively, these shifts are increasing peak demand, transforming load profiles and highlighting the urgent need for grid modernisation.

As these dual pressures intensify, Australia faces an immediate priority to reconfigure its power grids within a tight timeframe. While renewable generation projects can often be developed and commissioned within a few years, transmission infrastructure faces much longer planning, approval, and construction cycles. This mismatch between generation and transmission delivery has emerged as one of the most crucial challenges of the energy transition. The constraint is no longer the availability of renewable energy, but the grid's capacity to integrate new supply and rising demand at the scale and speed required to meet emissions, energy security and affordability objectives.

Delays of up to five years in some critical transmission projects are already creating compounding impacts across the system. If left unaddressed, this will exacerbate network congestion, increase renewable energy curtailment, prolong reliance on ageing thermal plants, delay new connections, undermine reliability and ultimately drive up electricity costs.

Recent projections from the Australian Energy Market Commission (AEMC) suggest that residential electricity prices in the NEM could fall by around five per cent by 2030 as low-cost renewable energy is added to the system. However, the energy market watchdog warns that delays to transmission

^{1&2}Australian Government, 2025. *Electricity and Energy Sector Plan*.

³Australian Energy Market Operator (AEMO), 2025. *Draft 2026 Integrated System Plan (ISP)*.

infrastructure and wind projects could reverse these gains, potentially pushing prices up by as much as 20 per cent by 2035⁴.

These delivery and timing challenges also intersect with broader supply chain risks across the energy system. Australia remains exposed in clean energy supply chains due to reliance on imported technologies and materials and is vulnerable to global shortages of critical grid components. Price volatility of these technologies and components is a key concern.

Australia's energy policymakers, regulators, renewable

energy developers, network service providers, and other stakeholders recognise these challenges and are actively addressing them through coordinated planning, targeted initiatives, and strategic investment to ensure that the electricity system can reliably support the energy transition.

The success of Australia's energy transition hinges on the timely expansion and modernisation of its transmission infrastructure. Here we examine the current state of the sector, the forces driving change, the implications for grids increasingly dominated by variable and dispersed resources, and the government and industry initiatives supporting the transition.

Figure 1: Australia's Electricity System Transition, 2025-2050



Note: 1 - All new lines are expected to be completed by 2042-43.

Source: AEMO's Draft 2026 Integrated System Plan (ISP), Global Transmission Research

⁴Australian Energy Market Commission (AEMC), 2025. Residential Electricity Price Trends.

WHERE WE ARE TODAY AND WHAT'S DRIVING CHANGE

2.1 The Supply Shift: Rise of Renewables and Distributed Energy

Australia's electricity system is undergoing a profound transformation, transitioning from traditional large-scale thermal generation to a future dominated by renewables. This shift is driven by ambitious climate commitments and the need for a more sustainable energy mix.

Australia has legislated a target of 82 per cent renewable electricity by 2030, recognising that decarbonising the power sector is central to achieving broader climate goals. Individual states and territories have adopted their own targets and timelines, often exceeding national ambitions, reflecting differences in local resources, infrastructure, and political priorities. These policies provide a clear roadmap for a fundamentally reconfigured energy system, centred on renewable generation, energy storage, and stronger interconnection across Australia's states and territories.

Driven by falling technology costs and an abundance of resources, renewable energy deployment is expanding rapidly across the country. Large-scale wind and solar generation continue to grow. The NEM – a wholesale electricity market linking the power systems of New South Wales (including the Australian Capital Territory), Queensland, South Australia, Victoria and Tasmania – is projected to see grid-scale wind and solar capacity more than triple by 2035, with a further 56 per cent increase by 2050⁵.

Similarly, Western Australia's SWIS is expected to

achieve a 28-times growth in grid solar and wind-based capacity by 2042⁶.

At the same time, coal-fired power plants, once the backbone of Australia's electricity system, are retiring at an accelerating pace. From a peak of nearly 29 GW in the early 2010s, coal capacity is projected to fall below 10 GW by the mid-2030s, with most plants expected to be decommissioned by 2040 and a complete phase-out by 2050⁷.

Distributed energy resources (DERs) are playing an increasingly significant role in Australia's energy transformation. Rooftop solar installations continue to proliferate across Australian households and businesses, with consumer-owned energy systems (CES) currently providing 25 GW of capacity in the NEM. Projections suggest that by 2035, 47 per cent of households will have rooftop solar, rising to 56 per cent by 2050, resulting in an estimated 87 GW of total rooftop solar capacity⁸.

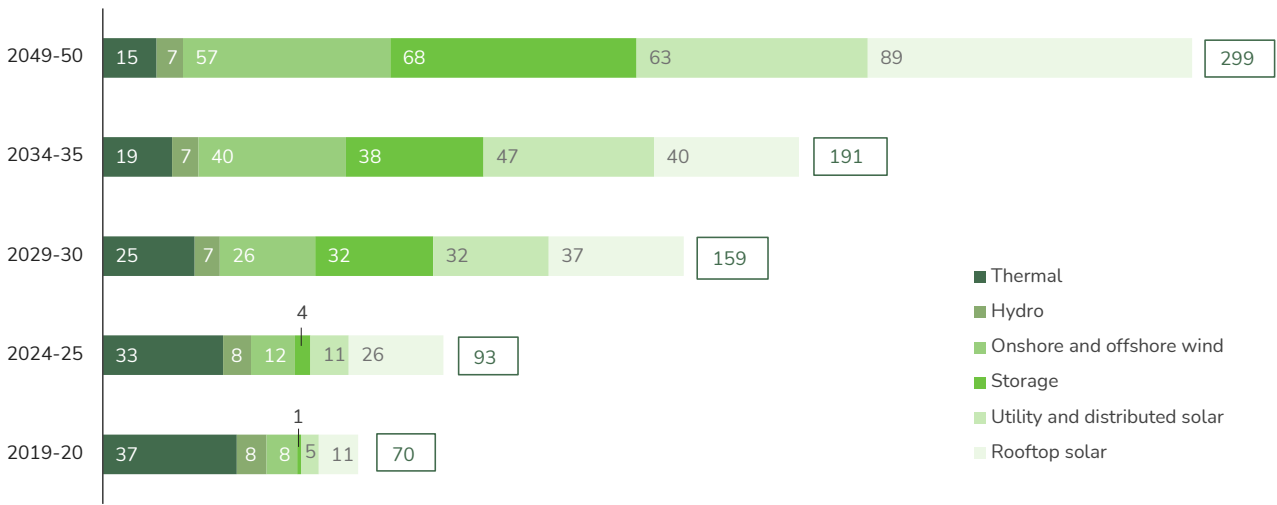
Complementing solar growth, battery storage is expanding rapidly, supported by lower costs, improved technology, and government initiatives such as the Cheaper Home Batteries Program. Household and commercial battery capacity is forecast to increase from 2 GW today to 5 GW by 2030, then surge to 27 GW by 2050, with approximately half of all solar households equipped with supporting batteries⁹.

This integration of storage with distributed solar is critical for balancing the variability of renewable generation and maintaining system reliability as coal plants retire.

^{5,7,8,9} Australian Energy Market Operator (AEMO), 2025. *Draft 2026 ISP*.

⁶ Government of Western Australia, 2024. *SWIS Demand Assessment 2023 to 2042*.

Figure 2: NEM's Future Installed Capacity (GW)



Note: Coal is expected to be phased out by 2049-50. Thermal for 2049-50 comprises mid-merit gas and flexible gas.

Source: AEMO's Draft 2026 ISP, Global Transmission Research

Australia's electricity system transition is firmly underway, marking an irreversible shift toward low-emission energy generation.

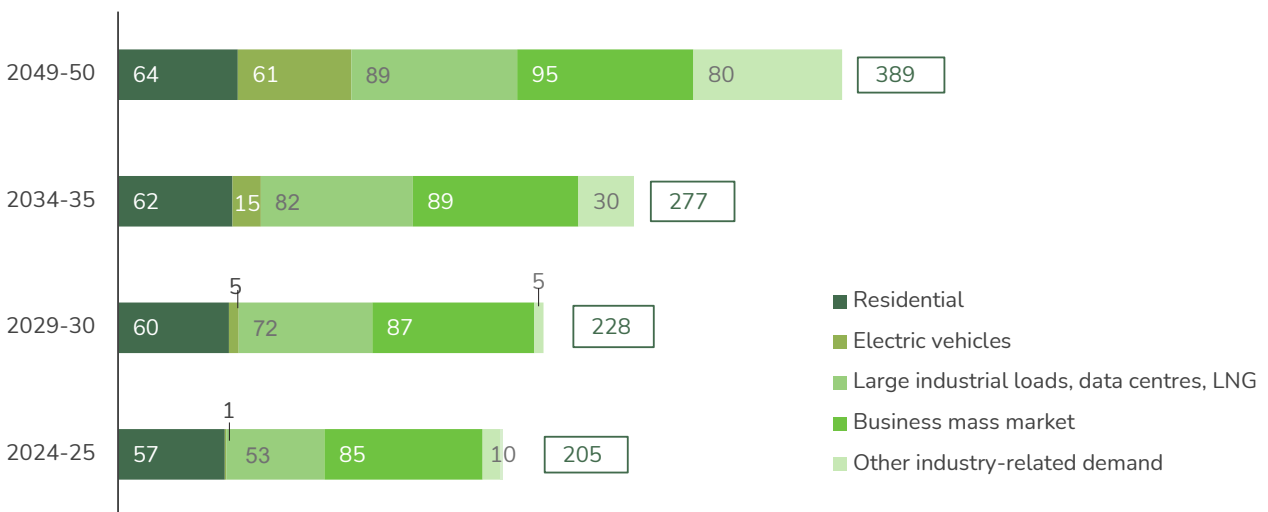
2.2 The Demand Transformation: Electrification of the Economy

Australia's electricity consumption has followed a distinctive trajectory over the past 20 years. NEM

demand grew steadily from 191 TWh in 2005-06 to a peak of 197 TWh in 2009-10, before declining to around 186 TWh by 2013-14, as energy efficiency gains and rooftop solar adoption offset underlying growth¹⁰.

This historical decline is now reversing. Total electricity consumption reached 205 TWh in 2024-25 and is projected to nearly double by 2049-50 to 389 TWh.

Figure 3: Australia's Consumption Projections for the NEM (TWh)



Source: AEMO's Draft 2026 ISP

¹⁰ Australian Energy Market Operator (AEMO), 2025. Draft 2026 ISP.

Out of this increase, nearly 116 TWh of electricity is projected to be supplied by consumer energy resources and other on-site generation¹¹.

Growth in electricity demand is being driven primarily by economy-wide electrification. Electric vehicles currently account for less than 1 TWh of annual electricity demand but this is projected to increase rapidly to around 61 TWh by 2049-50, representing approximately 16 per cent of total consumption in the NEM, as their uptake accelerates. At the same time, grid-scale electricity demand from business and industry, including data centres, is forecast to rise by around 90 per cent to 253 TWh¹².

The combined effect of these trends – rapidly scaling renewable generation, coal retirements,

rooftop solar approaching 90 GW, and electricity consumption nearly doubling by mid-century – presents an unprecedented spatial challenge. Australia's best renewable resources are mostly located far from coastal population centres and emerging industrial loads. Traditional transmission networks, designed around centralised thermal generation near demand centres, are not aligned with this new reality.

Meeting climate targets requires a strategic, coordinated approach toward infrastructure planning, as being implemented through the designated Renewable Energy Zones (REZs) with shared transmission infrastructure to connect renewable-rich regions to demand centres, ensuring an efficient and resilient energy transition.

^{11, 12} Australian Energy Market Operator (AEMO), 2025. *Draft 2026 ISP*.

RENEWABLE ENERGY ZONES AND GRID RECONFIGURATION

Australia's transmission transformation is largely being organised around Renewable Energy Zones (REZs) – designated areas that integrate generation, storage, and grid infrastructure in locations with strong renewable resources, linking them to demand centres through new or upgraded transmission networks. The REZ framework represents a shift from reactive, project-by-project network augmentation to strategic, proactive infrastructure planning that unlocks renewable capacity at scale.

3.1 REZs in the NEM

The Australian Energy Market Operator's (AEMO) Draft 2026 Integrated System Plan (ISP) identifies 44 REZ candidates within the NEM. These comprise 13 in New South Wales, 10 in Queensland¹³, nine in Victoria, eight in South Australia, and four in Tasmania.

The draft plan projects that renewable capacity in REZs in the NEM could grow from 27 GW in 2026-27 to 120 GW by 2049-50. Solar dominates early growth, with onshore and offshore wind increasingly contributing through the 2030s and 2040s.

However, REZ development is progressing at different speeds across states, reflecting policies, resource availability, and infrastructure readiness.

3.2 REZ Development Beyond the NEM

Western Australia is also advancing major projects, including the Narrogin REZ and export-focused hubs such as the Western Green Energy Hub (WGEH) and the Australian Renewable Energy Hub (AREH). The two energy hubs will feature large-scale wind and

solar generation, integrated battery systems, and are expected to support mining operations as well as hydrogen and ammonia production.

In the Northern Territory, a key project is the Darwin Energy Hub, which aims to deliver an additional 180-210 MW of solar generation and battery storage directly into the Darwin-Katherine electricity system. As of November 2025, the NT Environment Protection Authority had completed the project's environmental impact assessment.

A high-profile initiative in the Northern Territory is SunCable's Australia-Asia PowerLink (AAPowerLink), which proposes a large-scale solar and battery energy facility in the Barkly region. Power generated would be transmitted via a high-voltage direct current (HVDC) network to the north-east of Darwin and onward through subsea cables to Singapore.

¹³ It may be noted that under the *Energy Roadmap Amendment Act 2025*, Queensland is rebranding its REZs as Regional Energy Hubs.

Figure 4: Current Status of Major REZs in the NEM

NSW: Central-West Orana REZ

- Most advanced REZ, designed to deliver at least 4.5 GW of new network capacity by 2028, to connect 7.7 GW of RE projects
- ACERREZ, a consortium of ACCIONA, COBRA and Endeavour Energy, will construct and operate 240 km of transmission lines

NSW: South-West REZ

- Four RE and storage projects (totalling 3.56 GW) have been granted access rights
- Involves two major transmission projects:
 - Transgrid and ElectraNet building 900 km-long Project EnergyConnect linking NSW to SA
 - VNI West, a 500 kV interconnector being built by Transgrid and Transmission Company Victoria (TCV), to be completed by 2030

NSW: New England REZ

- As of November 2025, three companies have been shortlisted to build and operate the New England REZ
- The REZ has an intended network capacity of 8 GW

NSW: Hunter-Central Coast REZ

- Received planning approval in December 2025 to upgrade existing grid lines for 1 GW capacity by 2028
- Includes two new substations and upgrade of 85 km of lines

NSW: Illawarra REZ

- First urban REZ to integrate consumer energy resources such as rooftop solar, home and community-scale batteries
- Intended network capacity of 1 GW

Victoria

- VicGrid to deliver the infrastructure to connect Victoria's proposed REZs, which includes one offshore wind area in Gippsland
- It identified seven transmission infrastructure programs by 2040 in its 2025 transmission plan

Queensland

- State government and Powerlink working on developing several potential locations across three priority corridors – North/Far North, Central and Southern for REZ development
- Expected to unlock about 22 GW of RE capacity by 2035

South Australia

- AEMO's ISP identifies eight REZ candidates in SA, with the Mid-North and South-East zones carrying the largest projected build
- Mid North Expansion likely to have 2 GW capacity by July 2029 and involves construction of new 275 kV and 132 kV lines

Tasmania

- TAS government has proposed to develop the North West Tasmania REZ with an interest to develop about 1.6 GW of capacity
- A major project in this REZ is the Marinus Link Stage 1 interconnector, which will connect with Victoria and expected to be in operation by 2030

Source: Global Transmission Research

SYSTEM IMPLICATIONS

4.1 Grid Expansion and Interconnection: Ensuring Supply

AEMO's 2026 Draft ISP sets out a strategic roadmap for transmission investment across the NEM over the coming decades. It identifies the network expansion required to connect REZs, strengthen interstate interconnection, and maintain system security as the generation mix shifts rapidly toward variable renewable energy.

The ISP pipeline reflects an unprecedented expansion of the transmission network. Collectively, these projects are expected to deliver around 5,800 km of new transmission lines by the early 2040s. Many projects focus on strengthening and expanding the interconnection between states. Investment is concentrated in the late 2020s and early 2030s, with further major projects extending the build program into the mid-2030s.

Table 1: Key Upcoming, Planned and Proposed Projects in the NEM

Project	Key purpose	Voltage	Line Length	Developer	Expected In-service Date
Project EnergyConnect Stage 2: Buronga-Dinawan-Wagga Wagga (Eastern Section) and Buronga-SA/NSW border and Buronga-NSW/Victorian border (Western Section)	Enable an additional 800 MW of transfer capacity, creating a new transmission loop linking SA, NSW, and Victoria	330 kV/ 500 kV	700 km	Transgrid	October 2026
HumeLink: Wagga Wagga-Bannaby-Maragle	Integrate new RE capacity into the national grid and maximise the output of the expanded Snowy 2.0 hydro scheme	500 kV	365 km	Transgrid	December 2027
Hunter-Central Coast REZ Project: Kurri Kurri-Muswellbrook	Enable an additional 1 GW of network transfer capacity to support RE generation and storage within the HCC REZ region	132 kV	85 km	Ausgrid	July 2028
Central West Orana (CWO) REZ Project: Wollar-Merotherie-Elong Elong (500 kV) & Elong Elong-Uungula; Merotherie-Uarbry East; Merotherie-Uarbry West (330 kV) ¹	Connect CWO REZ, featuring 4.5 GW of network capacity in the first phase	500 kV and 330 kV	240 km	ACERESZ (a partnership between ACCIONA, COBRA, and Endeavour Energy)	December 2028

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Project	Key purpose	Voltage	Line Length	Developer	Expected In-service Date
Gladstone Project: Calvale-Calliope River (Stage 1) ²	Increase grid capacity to replace retiring Gladstone thermal generation and support industrial electrification	275 kV	87 km	Powerlink Queensland	March 2029
Northern Transmission (NTx) Project: - NTx South Bunday-Greater Adelaide - NTx North Bunday-Cultana East	Strengthen connections across the Mid North, Greater Adelaide, and Upper Spencer Gulf to enable renewables for industrial growth	Under planning	Under planning	ElectraNet	July 2029
Sydney Ring North (Hunter Transmission Project): Bayswater (Upper Hunter)-Olney (Lower Hunter)	Create a transmission backbone to unlock CWO and New England REZs and reinforce the NSW grid	500 kV	110 km	Transgrid (preferred network operator and final contract to be signed with EnergyCo in 2026)	November 2029
Western Renewables Link: Bulgana-Sydenham	Connect RE projects in western Victoria's REZ to the grid, and reduce congestion	500 kV	190 km	AusNet Services (contracted by VicGrid)	November 2029
Marinus Stage 1: Burnie (Tasmania)-Hazelwood (Victoria) ³	Link Victoria and Tasmania, providing Victoria greater access to Tasmanian hydropower	±320 kV HVDC	345 km (under-ground & undersea)	Marinus Link Pty Limited (jointly owned by the federal government and the state governments of Tasmania and Victoria)	June 2030
Victoria-New South Wales Interconnector West (VNI West): Bulgana-Tragowel-Murray River Crossing (Victoria)-Dinawan (NSW)	Deliver renewable power from NSW and Victoria REZs, particularly the Murray River and Western Victorian wind- and solar-rich regions	500 kV	240 km	Transgrid (NSW section) and VicGrid and Iberdrola Australia (Victorian section)	November 2030
Gippsland Offshore Wind Transmission: Giffard-Loy Yang Power Station Switchyard (Stage 1) ⁴	Connect the OSW infrastructure in the Gippsland Offshore Wind Zone to the mainland grid	500 kV	55 km	Development partner yet to be selected by VicGrid (under procurement)	July 2031-38

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Project	Key purpose	Voltage	Line Length	Developer	Expected In-service Date
Queensland-New South Wales Interconnector (QNI Connect)	Connect New England REZ transmission link to Queensland	Under planning	600 km	Powerlink (Queensland) and Transgrid (NSW)	March 2032
CopperString Eastern Link: Townsville-Hughenden ⁵	Connect Queensland's North West Minerals Province (NWMP) to the NEM and links the Flinders REZ, supporting industrial demand (including critical mineral mining, smelters, refineries) and renewable energy development	330 kV	350 km	New Queensland Investment Corporation (QIC) -managed entity (once established)/ Powerlink Queensland (during the transition phase)	2032
New England REZ Network Infrastructure Project	Unlock the capacity of New England REZ in stages – 2.4 GW in Stage 1 by 2032 and 3.6 GW in Stage 2 by 2034	500 kV and 330 kV	360 km	Network operator yet to be appointed by EnergyCo (under procurement)	July 2032 -2034

Notes: 1: Additionally, Transgrid is developing the CWO REZ Enabling Project, which involves the modifications to the 1.5-km, 330 kV Bayswater-Liddell line, and construction of a new 8-km, 330 kV Mount Piper-Wallerawang line.

2: Stage 2 involves reinforcement of the existing 95-km, 275 kV Bouldercombe-Larcom Creek line.

3: Stage 2 of Marinus Link is also proposed, with an expected in-service date of December 2034.

4: Stage 2 proposes to build two 500 kV lines from the existing transmission network near Driffield to Woodside and Giffard.

5: The project includes another section – the Western Link. This section will use an AUD200 million North West Energy Fund to partner with the private sector on flexible firming solutions, reducing gas reliance while transmission delivery options are developed.

Disclaimer: Information in this table is drawn from public sources. Project scope, timing, and outcomes may change due to policy, market conditions, or staged delivery.

Source: Global Transmission Research

In Western Australia, Western Power's Clean Energy Link – North is progressing toward completion in 2027 and will deliver upgraded transmission infrastructure along the 354 km Malaga-Three Springs corridor. The State Government has also identified four priority Pilbara corridors for new common-use transmission. In the Northern Territory, transmission development is expected to support the Darwin Energy Hub and SunCable's AAPowerLink project (see Chapter 3.2).

However, delivering this scale of infrastructure requires more than technical planning and regulatory

approval. Social licence has emerged as a critical input into transmission delivery. Projects are increasingly facing delays, route changes, or cancellations due to community concerns, including impacts on property values, agricultural land, visual amenity, environmental assets, and Indigenous heritage. Early and meaningful engagement with affected communities has become essential. Transparent route selection, fair compensation mechanisms, and ongoing consultation are now prerequisites for timely delivery. Without broad community acceptance, the pace of transmission expansion required to support the energy transition will be difficult to achieve.

4.2 System Performance: Ensuring Stability, Flexibility, and Resilience

As Australia's electricity system transitions from synchronous, thermal generation to a renewable-dominated and digitally enabled grid, system performance challenges are increasing in complexity. Ensuring stability, flexibility, and resilience has become more difficult than ever.

The complexity is amplified by Australia's long, weakly interconnected transmission network, which increases risks to frequency control, voltage stability, and system strength as renewables and distributed resources expand. Maintaining reliable operation as coal retires will require updates to grid codes, reserve requirements, and market arrangements to ensure essential system services remain available.

On the other hand, the power system is increasingly exposed to external threats, including climate change and other natural disasters, physical, cyber, and cyber-physical sabotage, as well as fragile and globally exposed supply chains.

Advanced technologies and solutions are available to support system operators in addressing these challenges, while enabling higher renewable integration, reducing congestion and losses, and strengthening the overall system.

With high levels of renewable energy penetration, grid stability increasingly depends on power-electronics-based solutions rather than traditional synchronous generators. Grid-forming Battery Energy Storage Systems (BESS), together with Flexible AC Transmission Systems (FACTS) technologies such as Static Synchronous Compensators (STATCOMs), provide essential services such as frequency support, voltage regulation, inertia-like response, and black-start capability.

When complemented by other technologies such as Phasor Measurement Units (PMU), Advanced Metering Infrastructure (AMI), and Dynamic Line Rating (DLR) systems, operators gain better

visibility and control, enabling earlier detection of instability and safer operation of networks closer to their physical limits.

In parallel, Remedial Action Schemes (RAS), Advanced Energy Management Systems (AEMS), and AI-driven digital twins enable fast, predictive responses to faults, extreme weather, and equipment failures, thereby reducing the risk of cascading outages. Solar-plus-storage energy hubs and microgrids further enhance resilience by coordinating local generation, storage and loads, allowing critical services to island during disruptions, while robust cybersecurity measures ensure systems remain secure and flexible.

BESS can also play an important role on the demand side, alongside demand response and DER platforms such as Virtual Power Plants (VPPs) and Distributed Energy Resource Management Systems (DERMS). These technologies increase system flexibility by allowing domestic consumers (electric vehicles and heat pumps), as well as other distributed assets, to shift load, store excess renewable generation, and provide fast-acting grid services that reduce congestion and peak demand.

As Australia expands its power network, high-voltage direct current (HVDC) technology already offers an efficient solution to increase transmission capacity. HVDC enables higher power transfer over long distances with lower losses and greater controllability than conventional AC systems. HVDC systems with grid forming controls further enhance system stability. This makes HVDC well-suited to Australia's dispersed geography, growing share of variable renewable generation, and increasing need for interconnection between states and territories.

The ability of the electricity system to operate securely under stress – during extreme weather events, extended low-renewables periods, or network outages – will define public confidence in Australia's energy transition.

ENABLING THE TRANSFORMATION: GOVERNMENT IN ACTION

Australia's energy transformation is being supported by accelerated action from the federal and state governments. A comprehensive framework of policies, programs, and initiatives is emerging to support the delivery of a reliable transmission system while managing costs and ensuring equitable outcomes.

5.1 Key Federal Initiatives

The federal government has established several programs that provide financial support, regulatory streamlining, and strategic coordination. The Capacity Investment Scheme (CIS), expanded to 40 GW in July 2025, has progressed through eight competitive tender rounds since May 2024. As of December 2025, 39 renewable projects (13 GW) and 20 battery projects (4.8 GW) have been awarded across five states, with a further 7.2 GW in active tenders.

In December 2025, the government endorsed the Nelson Review, which recommends reforms to wholesale market settings to support investment in firmed renewable generation and storage in the NEM ahead of the completion of the current CIS in 2027.

The National Renewable Energy Priority List identifies 24 transmission projects and 32 generation and storage projects eligible for additional funding and streamlined regulatory processes. These projects span the entire NEM, including major transmission developments across all states.

Rewiring the Nation, an AUD20 billion scheme administered by the Clean Energy Finance Corporation (CEFC), provides concessional loans and equity investments to accelerate transmission delivery.

Complementing these measures, the First Nations Clean Energy Strategy (2024-2030) establishes a national framework to support Indigenous participation through shared ownership models, employment pathways, and partnerships, ensuring the energy transition delivers equitable benefits.

5.2 Key State-Level Policy Initiatives

Apart from federal initiatives, Australian states and territories have set their own clean energy ambitions, often exceeding national targets and sometimes adopting different approaches to renewable generation, storage, and grid development.

New South Wales strengthened its policy framework in 2025, setting a target of 16 GW of renewable capacity by 2030 through updated Infrastructure Investment Objectives. A Transmission Planning Review recommended closer coordination between Transgrid, EnergyCo and AEMO. The state has also established the Energy Security Corporation, committing AUD 1 billion to storage investment.

Queensland has made changes to its energy policy with the Energy Roadmap Amendment Act 2025, replacing the former Energy and Jobs Plan 2022 and repealing legislated renewable energy targets in favour of a more market-driven planning framework. REZs have been rebranded as Regional Energy Hubs to support coordinated development of generation, storage and transmission assets. The state government has also created an AUD 400 million fund to stimulate investment across renewables, gas, and storage while maintaining a focus on reliability and affordability. Despite moving away from its earlier established clean energy targets, Queensland

Table 2: Key Federal Government Initiatives Supporting Grid Development

Initiative/Program	Purpose	Scope / Key Details	Impact on Grid Development
Capacity Investment Scheme (CIS)	Financial support for large-scale renewables and storage	Expanded to 40 GW (July 2025), 39 RE projects (13 GW) and 20 battery projects (4.8 GW) awarded across 5 states; 7.2 GW in active tenders	Drives grid expansion for new generation
Nelson Review (December 2025)	Improve investment certainty in the wholesale market	Market reforms to reduce risk and provide continuity beyond CIS	Drives transmission needs by enabling new firming renewable generation
National Renewable Energy Priority List	Fast track priority transmission and generation projects	24 transmission and 32 generation/storage projects across NEM, eligible for funding and streamlined approvals	Supports grid delivery through faster approvals and access to funding
Rewiring the Nation (administered by CEFC)	Provide concessional loans and equity to transmission projects	AUD20 billion fund: <ul style="list-style-type: none"> AUD4.7 billion to NSW transmission projects (such as VNI West, HumeLink, Sydney Ring, CWO REZ) and an additional AUD1.4 billion to strengthen the existing NSW grid AUD3.8 billion concessional finance from CEFC for Marinus Link Stage 1 in Tasmania AUD2.25 billion to REZs and VNI West and up to AUD1 billion for T&D projects in Victoria Up to AUD3 billion to modernise Western Australia's electricity networks Up to AUD250 million to upgrade and expand the power grid in the NT 	Lowers project costs and weighted average cost of capital (WACC) improving affordability and accelerating transmission buildout
First Nations Clean Energy Strategy (2024-2030)	Promote Indigenous participation and benefit sharing	Shared ownership, employment pathways, and partnerships	Supports social licence for transmission through Indigenous engagement and partnerships
EPBC Reforms Bill (November 2025)	Streamline environmental approvals	Reforms to federal environment law; introduces Streamlined Assessment Pathway and stronger compliance via National Environmental Protection Agency (NEPA)	Accelerates transmission approvals while strengthening environmental standards
AEMO Connection Reform Initiative	Reduce NEM connection delays	Streamlined Connection Process; improved data, access standards, and collaboration; Phase 1 nearing completion	Improves connection certainty and shortens transmission planning and delivery timelines

Source: Global Transmission Research

anticipates adding 6.8 GW of wind and solar and 3.8 GW of storage by 2030.

Victoria released the 2025 Victorian Transmission Plan, identifying six REZs, seven priority transmission projects, and the Gippsland Shoreline REZ to connect offshore wind. Targets include 65 per cent renewable generation by 2030 and 95 per cent by 2035, supported by 2.6 GW of storage by 2030 and 6.3 GW by 2035. Offshore wind goals are 2 GW by 2032, 4 GW by 2035, and 9 GW by 2040, alongside a net-zero emissions goal by 2045.

South Australia accelerated its target for net 100 per cent renewable electricity to 2027, supported by the 2025 Electricity Development Plan and revisions to the Retailer Energy Productivity Scheme that mandate increased demand-side efficiency.

Tasmania continues to pursue an ambitious renewable energy target, aiming to produce renewable electricity equivalent to 200 per cent of its current needs by 2040, with surplus generation intended for mainland exports via the proposed Marinus Link interconnector.

Western Australia is upgrading its main electricity

network through the SWIS Transmission Plan, coordinated by the newly established PoweringWA in collaboration with Western Power. These investments support the planned retirement of state-owned coal generation by 2030 and accelerate renewable integration to meet growing demand.

The Northern Territory is revising its energy policies. It has repealed the previously legislated target of 50 per cent renewable generation by 2030 and is now pursuing a broader energy strategy that emphasises a mix of renewables and greater reliance on natural gas.

Conclusion

Australia stands at a pivotal moment in its energy transition, where transmission infrastructure is key to delivering a secure, affordable, and sustainable electricity system. Bridging the generation–transmission delivery gap will require sustained collaboration across governments, regulators, industry participants, and communities. With decisive and coordinated action, Australia can deliver a resilient, low-emissions electricity system that meets its climate commitments while maintaining public confidence and economic competitiveness.

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