



# Snapshot of Australia's renewable energy market

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# Ambitious renewables and net zero targets by federal and state governments

After many years of limited action on climate change, a change in federal government has seen Australia set a target to reduce emissions by 43% below 2005 levels by 2030 and achieve net zero by 2050. In its first budget the new federal government announced close to AUD25 billion of commitments to clean energy, which has been well received as a demonstration of its commitment to fast-track the decarbonisation of the economy.

Individual states are setting similarly ambitious targets, and there have been a number of recent announcements by states of revised ambitious targets and earlier planned dates for the closure of coal-fired power stations.

For example, Queensland has recently announced a AUD62bn plan centred on achieving a 50% renewable energy target by 2030, 80% renewable energy by 2035 (coinciding with the end of reliance on coal-fired power generation in the state) and net zero emissions by 2050. To meet these ambitious targets it is anticipated that by 2035 there will be eight times more renewable energy generated in the state than in 2022.

A further example is Victoria recently announcing revised targets of 95% of electricity sourced from renewable energy by 2035, coinciding with the early closure of AGL's Loy Yang A power station which currently provides 30% of Victoria's electricity and is the biggest single carbon-polluting plant in Australia, and net-zero by 2045 (five years earlier than the previous target).

Shortly after announcing its revised targets, and aimed at ensuring a smooth transition to renewables, the Victorian government announced an intention to bring back public ownership of generators through reviving the State Electricity Commission (SEC), which was privatised in the 1990s, and committing AUD1bn to investment in renewable energy projects to be delivered by the SEC. The details around the role of the SEC remain to be confirmed, with the government indicating that it is considering a broad range of options, including becoming a state-run retailer, partnering with an ethical retailer or remaining solely on the wholesale market. The SEC is expecting to deliver 4.5GW of power through its initial projects (matching the output of Loy Yang A), and will retain a controlling interest in them. The balance of funding is anticipated to be secured from "like-minded entities" such as industry super funds.



# A clearer path to “net zero”

In the middle of the year the Australian Energy Market Operator (AEMO), which is tasked with managing the electricity and gas systems and markets across Australia, released its highly anticipated 2022 Integrated System Plan (ISP). The ISP is a whole-of-system roadmap for the National Electricity Market (NEM) (the wholesale electricity market covering the six eastern and southern states and territories and that delivers 80% of all electricity consumed in Australia) for the next 30 years.

Critically, the ISP is seen as the roadmap for the investment required to transform the NEM from reliance on fossil fuels to renewables. The ISP contemplates in excess of 10,000km of new transmission lines, significant new wind and solar developments, and batteries, pumped hydro and gas-fired generation providing the necessary firming capacity.

Even more recently, state and federal energy ministers agreed to include emissions reduction as part of the National Energy Objectives (which, among other things, guide AEMO in the performance of its powers). While not yet implemented, this signals an intention to consider climate change when forming and implementing energy policy (until now, the objectives have not had any reference to the environment, only to price, quality, safety and reliability and security of supply).

# Strong development pipeline

A significant number of large-scale onshore wind and solar projects (many as hybrid projects including battery storage) and standalone battery projects are in various stages of development. A strong pipeline of development of new renewable generation and storage will be essential to ensure a smooth exit of the coal-fired power generators and to meet the federal and state government's ambitious renewable energy targets.

New South Wales has recently commenced the largest renewable energy auction seen in Australia to date. The auction, which opened in early October, is New South Wales' first in a series of bi-annual tenders to take place over the next ten years for renewable energy and long-duration storage contracts. This auction is part of the NSW Electricity Infrastructure Roadmap that targets the construction of 12GW of renewable energy and 2GW of long-duration storage by 2030.

Given the current context and the level of global competition for materials required for the construction of new renewable energy facilities, there is likely to be a challenge in sourcing the materials needed to meet the development pipeline. As part of its recent budget, the federal government announced funding to support the extraction of critical minerals and onshore manufacturing of key components for the transition to renewables (including solar panels and batteries).

With a record low unemployment rate and significant development both planned and underway on of projects related to both energy transition and infrastructure more broadly, the market is seeing a skills and personnel shortage comparable to that last seen during the post-GFC mining and infrastructure boom. Like in the last skills and personnel shortage, a focus of government and industry is on not only attracting skilled international workers, but also re-skilling the domestic workforce. In Queensland this focus on re-skilling the workforce is a key feature of its AUD62bn “Energy and Jobs Plan”, with a commitment to establishing two regional transmission and training hubs.

# High demand for batteries

There is high demand for large-scale battery storage (both as standalone projects, but also retrofitted to existing renewable generators and as a key component in hybrid projects with proposed new renewable generation), both as an important grid stability tool and to provide baseload power as existing baseload generation is taken offline and replaced with intermittent renewable energy.

Utility-scale batteries are also proposed as an interim solution to increase transmission capacity in the existing network as significant expansion and upgrade works of the transmission network are undertaken to accommodate the move from a small number of large power stations to a large number of renewables projects spread across a wide area. By way of example, the Waratah Super Battery, to be located at a decommissioned power station site in New South Wales, is intended to perform this function on a short-term basis. At 700MW, the Waratah Super Battery will be the largest standby network battery currently in the southern hemisphere.

Victoria has recently announced a large-scale energy storage target of 2.6GW of new energy storage by 2030 and 6.3GW of energy storage by 2035. While these targets will support further development of utility-scale batteries, the targets are also aimed at long-duration energy storage systems such as pumped hydro and hydrogen technologies. Queensland has stated it is also working on developing energy storage targets, but these are not anticipated to be announced until 2024.

The federal government has also committed funding as part of the recent budget to deploy 400 community batteries across Australia with the aim of enabling households to store and use excess power produced through rooftop solar (which has seen significant uptake in Australia).

# Development of Renewable Energy Zones (REZs)

Renewable energy zones are being developed across New South Wales, Queensland and Victoria as renewables-based equivalents of power stations. While each state is pursuing the development of REZs in a slightly different fashion (including how the state is proposing to use public, private and concessional funding), the commonality is that these zones are proposed to combine generation, transmission and storage in one location to address issues associated with grid connection and transmission infrastructure.

In New South Wales, the procurement process for the first of its renewable energy zones, the Central West Orana renewable energy zone, is underway. Procurement of the New England renewable energy zone is expected to commence early to mid-2023 and three other renewable energy zones are expected to be developed over the coming years.

In Queensland, Powerlink (being a Queensland government-owned corporation) has recently secured innovative concessional financing from the Clean Energy Finance Corporation (CEFC) (being the federal government-owned green bank) for Queensland's first renewable energy zone, the Southern Downs Renewable Energy Zone. This renewable energy zone will connect the MacIntyre Wind Project (the first phase of which is approximately 1000MW) to the NEM. There are also plans for at least two further REZs in Queensland: the Central Queensland Renewable Energy Zone (in the region around Gladstone, which hosts significant coal-fired energy generators and large industrial energy users) and Northern Queensland Renewable Energy Zone (located in the region from Mackay to Cairns). Queensland's path differs slightly from other states, given that the transmission network in Queensland remains publicly owned.

The recent federal budget included funding to fast-track the development of renewable energy zones in Victoria, recognising that these are an essential element to the development of an offshore wind industry in Victoria.

# Increasing focus on pumped hydro and other long-duration storage as an essential component in the move to 100% renewables

There is an acknowledgement that batteries alone are unlikely to meet the energy storage demands required as baseload power is taken offline. As a result, there are increasing opportunities for pumped hydro as a long-duration energy storage mechanism along with other technologies, including longer-duration batteries (above four hours).

As part of Queensland's AUD62bn plan to achieve net zero, the government announced it would develop the world's largest pumped hydro scheme: the Pioneer-Burdekin Pumped Hydro project near Mackay, which will provide 5GW of 24-hour storage, with a targeted completion date for stage 1 of 2032, and a 2GW pumped hydro project at Borumba Dam near Gympie.

Pumped hydro also presents an opportunity for open-cut mines that have reached the end of their operational life to be repurposed. Examples include Genex Power's Kidston Pumped Hydro project in Queensland, which has been constructed using the pits of an abandoned gold mine, and Idemitsu Australia Resources and AGL's proposed Muswellbrook Pumped Hydro project in the Hunter Valley, which will utilise an existing mine void from Idemitsu's Muswellbrook Coal Mine, a project that recently secured funding from the Energy Corporation of New South Wales (EnergyCo) to undertake further feasibility studies.



# Huge investment in upgrading and extending transmission infrastructure

In addition to the REZs, there is significant investment proposed and underway to upgrade and expand the transmission networks to accommodate the transition away from coal-fired generation and towards renewable generation. The level and urgency of investment into transmission infrastructure was highlighted by AEMO in the 2022 ISP.

At a Commonwealth level, the federal government has committed AUD20bn to “rewiring the nation” and is establishing a new Rewiring the Nation Office within the Department of Climate Change, Energy, the Environment and Water. The first of the projects to be supported by low-cost loans as part of the rewiring the nation programme was announced as part of the recent budget and includes the Marinus Link project (twin 750MW underwater cables connecting Tasmania and Victoria) and the Victoria-New South Wales Interconnector (VNI West) KerangLink project, which had both been identified in the 2022 ISP as critical projects. Marinus Link is a key part of Tasmania’s battery of the nation plan, which is aimed at increasing the mainland NEM states’ access to large-scale pumped hydro and renewables in Tasmania.

In Queensland this investment includes the construction of a new transmission “super grid”; an approximately 1500km 500kV transmission line from Brisbane (in the south of the state) to North Queensland, providing a high-capacity, high-voltage backbone connecting renewable storage with regional centres including Gladstone and Townsville.

There are also significant upgrades and expansions underway or proposed to the transmission network in New South Wales, including the 900km+ AUD1bn+ EnergyConnect project, a critical interconnector between New South Wales, South Australia and Victoria; the HumeLink project (a new 360km 500kV transmission line in the south-east of the state); the Sydney Ring (required to ensure the system is capable of supplying renewable energy to Sydney, Newcastle and Wollongong); and the New England Transmission Link (required to support the development of the proposed New England REZ).

# High level of interest from government and private sector in developing a green hydrogen industry

The federal and state governments are keen to drive development of a green hydrogen industry in Australia and to establish Australia as a major hydrogen exporter. In 2019 the Council of Australian Governments (COAG) Energy Council endorsed a National Hydrogen Strategy setting out actions for the development of a hydrogen industry in Australia. Each of the states has announced hydrogen strategies, many accompanied by funding packages to encourage investment in the hydrogen industry. In addition, the Australian Renewable Energy Agency (ARENA) has provided funding to a number of hydrogen development projects, including both feasibility and project development funding.

As part of Queensland's recently announced AUD62bn Queensland Energy and Jobs plan, Queensland is proposing to build the state's first hydrogen-ready gas turbine. A number of owners of gas-fired generators have indicated plans to explore the use of green hydrogen as fuel for their existing generators. Queensland's plans in the hydrogen space have been further enhanced by the federal government's commitment to provide AUD70 million to deliver a new green hydrogen hub in Townsville.

Beyond funding, important policy steps are being implemented. Notable current initiatives (not yet complete) include implementing a scheme to certify green hydrogen, amending regulation to allow hydrogen into existing gas networks and a review of the entire Australian regulatory framework to identify areas that need to change to facilitate hydrogen production and transport.

As of today, a number of green hydrogen projects have been announced or are under development by the private sector, including the Hydrogen Energy Supply Chain project in Victoria, which is a pilot project to produce and transport clean hydrogen from the Latrobe Valley to Japan. There are also projects focusing on domestic use of hydrogen, including Australian Gas Networks' project at its Murray Valley Hydrogen Park that will blend green hydrogen produced at the facility with natural gas and distribute the blended gas to industrial and transport users through its gas network.

Hydrogen is also expected to form a key part of decarbonisation of the transport sector. The federal government has provided funding in the recent budget for a "hydrogen highways" initiative which will be undertaken in partnership with the state and territory governments with the target of creating hydrogen refuelling stations on the nation's busiest freight routes.



# Offshore wind development shifts up a gear

Australia currently has no operational offshore wind projects, with the legislation to facilitate development of offshore wind projects only introduced in late 2021, and the regulations published in the last month. There are now at least 25 offshore wind projects planned for Australia, primarily off the coast of Victoria, Tasmania, Western Australia and New South Wales (where the proposed projects are predominantly located near the proposed Hunter Central Coast renewable energy zone and Illawarra renewable energy zone).

Victoria is setting the pace for offshore wind development and is likely to be the state with the first offshore wind project. Earlier this year the Victorian government announced ambitious targets of 4GW of offshore wind capacity by 2035 and 9GW by 2040, and the federal government has recently officially commenced the process to declare Gippsland, off the coast of Victoria, as Australia's first zone for offshore wind development.

The coastlines of New South Wales, Tasmania and Western Australia have also been identified as suitable areas in which offshore wind projects may be developed and a number of projects have been proposed in these areas.

# High volume of M&A

There continues to be a high volume of M&A activity in the Australian energy market, with individual projects being acquired mostly by financial investors, and combinations of operational and development projects and teams being acquired by local and international utilities and financial investors looking for a stronghold in the Australian market.

This year alone we have seen Igneo Infrastructure Partners continue its expansion into the Australian market through the acquisition of Elliot Green Power Australia (with 302MW of operating solar assets) for circa AUD500m, CWP Renewables put its Australian portfolio of wind projects on the market (1.5GW of operational or under-construction assets, 5.8GW in advanced developments and 5.7GW early-stage developments) with an estimated price of AUD4bn, and Wirsol Energy (the Australian arm of German-owned renewable energy multinational Wircon), which operates 400MW of solar projects and has a further development pipeline of 300MW, is seeking buyers for its estimated AUD850m business.



# Continued market for corporate PPAs

Large energy users are continuing to enter into long-term renewable power purchase agreements, with corporate PPAs providing lower electricity costs and reduced exposure to market volatility (a particular benefit this year as the market has been extremely volatile), and acting as a key component in achieving net zero targets.

Earlier this year two of Australia's largest infrastructure fund managers, IFM Investors and the Queensland Investment Corporation, along with Transurban as a buyers group, entered into an arrangement with Origin Energy to buy approximately 132GWh of renewable power annually for seven infrastructure assets in New South Wales and Victoria. This collective arrangement is expected to deliver significant cost savings (estimated to be in the order of 15%) and the achievement of net zero targets much sooner than previously anticipated.

# High energy users turning to green power

A number of high energy users are installing or procuring their own renewable power generation facilities to supply their electricity, with the main drivers being to decarbonise their operations and to make meaningful progress to achieving net zero targets. This is being seen in particular at remote mines with vast available land and high power costs (with some operators looking to take this a step further and include hydrogen production to fuel vehicle fleets).

Fortescue Metal Groups has set an ambitious target of achieving carbon neutrality across its iron ore operations by 2030, the achievement of which is estimated to require USD6.2bn. It's wholly owned subsidiary, Fortescue Future Industries (FFI), has been and will continue to be key to Fortescue achieving this target. FFI has been extremely active in the renewables market both domestically and globally to build its portfolio of hydropower, geothermal, hydrogen wind and solar assets, and to develop technology to enable it to decarbonise heavy haulage and shipping associated with Fortescue's operations.

Another big program is being led by Rio Tinto, Australia's largest industrial consumer of electricity, which is running a process seeking proposals to develop at least 4GW of wind and solar projects in Queensland to power its energy intensive smelter and alumina refineries in Gladstone. Rio Tinto is also developing 1GW of solar and wind power at its Pilbara operations in Western Australia.



# Potential for Australia to be an exporter of energy to the region

Given its abundant land and natural resources, Australia is in a prime position to become an exporter of energy, with a particular focus on export into APAC markets.

An example of this is the Sun Cable's Australia-Asia PowerLink project, which aims to supply 15% of Singapore's electricity needs from solar and battery projects in the north of Australia. Power from the project will be exported from Darwin to Singapore via a subsea cable. In total, the energy generated will be transmitted approximately 5,000km from where it is generated to the market in which it will be used.

Green hydrogen, in particular via green ammonia, is also an element of Australia's plans to become an exporter of energy to other markets. The Asian Renewable Energy Hub (AREH) located in the Pilbara region in Western Australia is being developed by BP, InterContinental Energy, CWP Global, Macquarie Capital and Macquarie's Green Investment Group and has the potential to produce approximately 1.8 million tonnes per annum of green hydrogen. While some of the output of the AREH will be used locally in the energy-intensive industries located in the Pilbara region and domestically within Australia, it is expected to be a significant exporter of energy.

# Likely introduction of a capacity mechanism

Material disruptions to the energy market in Australia in mid-2022 culminated in the Australian Energy Market Operator (AEMO) suspending the National Electricity Market (NEM) for nine days. A variety of factors contributed to the suspension of the market, including outages of approximately 25% of coal-fired power stations, high global coal and gas prices driven by the invasion of Ukraine, and a cold snap resulting in increased demand for energy.

Following the suspension, state and federal energy ministers met and agreed to actions to be taken to seek to ensure a smooth transition to renewable energy. One of the actions includes the development of a capacity mechanism which would reward energy projects for guaranteeing energy supplies that can be called upon when needed, instead of just paying energy projects for the power that they produce. This policy is aimed at encouraging investment into dispatchable power projects, including projects such as fast-start gas plants, big batteries and pumped hydro.



# Key contacts

If you would like any further information or to discuss how we can help you navigate the opportunities mentioned, please don't hesitate to contact us.

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