

Climate Transition Action Plan



EnergyAustralia

LIGHT THE WAY

1 Acknowledgment of Country

EnergyAustralia acknowledges Aboriginal and Torres Strait Islander people as the First Peoples, Traditional Owners and Custodians of Australia. We recognise and value their sacred connection to lands, waterways and community and the cultural, spiritual and educational practices that make this enduring. We pay our respects to all Aboriginal and Torres Strait Islander Peoples and acknowledge Elders past and present. In the spirit of reconciliation and our value of Making a Difference, EnergyAustralia supports the Uluru Statement from the Heart in its entirety including a Voice to Parliament.

Artwork by Mandy Nicholson

2 About this Climate Transition Action Plan and its assumptions

This inaugural Climate Transition Action Plan sets out EnergyAustralia's ambition and approach to decarbonisation. It has been prepared referencing guidance from the United Nations High-Level Expert Group on the Net Zero Commitments of Non-State Entities, the Transition Plan Taskforce, the Investor Group on Climate Change, the Financial Stability Board's Task Force on Climate-related Financial Disclosures and the International Sustainability Standards Board's IFRS S2 Climate-related Disclosures. The Climate Transition Action Plan also relies on energy system analysis and scenarios from the Australian Energy Market Operator's 2022 Integrated System Plan. Comprehensive EnergyAustralia Scope 1 and Scope 2 emissions data are reported under *the National Greenhouse and Energy Reporting Act 2007* (Cth) while the Scope 3 emissions referenced in this Climate Transition Action Plan have been calculated using the Greenhouse Gas Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard and associated guidance documents. Further information on EnergyAustralia and its operations can be found on the [EnergyAustralia website](#).



INTRODUCTION

1. Acknowledgement of Country	1
2. About this Climate Transition Action Plan and its assumptions	1
3. Chair and Managing Director's message	2
4. Our transition ambition	4
5. Background	5
5.1 About EnergyAustralia	5
5.2 The need for a resilient energy system	6

EMISSIONS AND TARGETS

6. Our commitments	8
6.1 The commitment to decrease our Scope 1 emissions	8
6.2 Partnering to expand our renewable portfolio to include up to 3 GW of renewable energy by 2030	8
6.3 Portfolio pipeline and role of Mount Piper to address Scope 1 emissions	8
6.4 Our approach to gas-fired generation	12
6.5 Our approach to Scope 2, electricity-use emissions	13
6.6 Our approach to Scope 3 emissions	14
6.7 Our approach to customer energy-use emissions	14
6.8 Biodiversity and environmental impacts	17

DECARBONISATION PLAN

7. EnergyAustralia's decarbonisation pathway	18
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8. Fairness	20
8.1 Responsible Yallourn transition	20
8.2 Supporting our local communities	21
8.3 Supporting our customers	21
8.4 Reconciliation	22
8.5 Our approach to asset development	22
8.6 Supply chains	22

9. Operational alignment to support the Climate Transition Action Plan	23
9.1 Governance	23
9.2 Remuneration and incentives	24
9.3 External advocacy	25
9.4 Memberships	25

APPENDIX

10. Assumptions, risks, limitations and reviews	26
10.1 Assumptions	26
10.2 Risks	26
10.3 Limitations on forward-looking statements	27
10.4 Climate Transition Action Plan review cycle and updates	27

11. Glossary	28
11.1 Defined terms	28
11.2 Electricity measures	29
11.3 Version control	29

12. Endnotes	29
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3. Chair and Managing Director's message



EnergyAustralia's purpose is to "lead and accelerate the clean energy transformation for all". We have a responsibility to act to help avoid the most devastating consequences of climate change. EnergyAustralia is committed to achieving Net Zero across Scopes 1 and 2 by 2050, and it is our ambition for this commitment to extend to Scope 3. We understand the size of the task both for EnergyAustralia and Australia as a whole. We are decarbonising by investing in and supporting assets that enable the clean energy transformation.

Our Climate Transition Action Plan is a milestone in the delivery of our commitments to date. It reflects both our role as an energy company serving our retail and business customers and as a key part of Australia's energy generation system. Our path to Net Zero requires us to address the contributions needed in both roles. We acknowledge the Paris Agreement and the importance of the energy system's contribution to limiting average global warming to well below 2°, and to pursuing efforts to limit it to 1.5° above pre-industrial averages. We are aware of the real challenges in meeting 1.5° alignment. This Climate Transition Action Plan explains where we are on the journey to achieving this goal and what the next steps are in the process.

The scale of the clean energy transformation in Australia is substantial and the energy sector has been at the forefront. Modelling by the Australian Energy Market Operator of the changes and development required in the National Electricity Market highlights the need to double the electricity delivered in the NEM by 2050 to meet the energy needs of Australia. This growth is needed in addition to investment by households and businesses in technology such as rooftop solar and energy efficiency. At the same time, the expected pace of withdrawal of coal-fired generation places further demands on the system. The change from coal-fired generation to renewable generation requires investment to treble the renewables firming capacity that can respond when the system needs it¹. Australia's challenge is to build the new, renewables-dominant system before fully retiring the existing one. This is the most significant undertaking of the modern era, and currently, there remains uncertainty and unpredictability about the pace at which the system transformation can be achieved.

The scale of the clean energy transformation in Australia is substantial and the energy sector has been at the forefront.

The energy system of the future will depend on storage technologies that can supply electricity when dark and still conditions mean that renewable energy production is low. Consistent with the CSIRO's Renewable Energy Storage Roadmap, we see multi-day and seasonal storage playing a "key energy 'insurance' and resilience role"². However, as stated by the CSIRO, currently available technology options in this regard are "limited and often have long lead times"³. For now, this technology gap and the degree of uncertainty around the timing of key transformation projects, from transmission to generation, constrain our ability to fully exit from the use of fossil fuels. However, we see substantial opportunities to decarbonise by reducing the output from fossil fuel power stations by investing in and/or supporting currently available renewable and firming technologies both in the grid and in homes and businesses.

We are working hard to deliver the new additions to our portfolio that will reduce the need for, and output and emissions from, our higher-emissions assets, and eventually allow us to permanently retire them. Energy customers rely on having affordable power when they need it, even as Australia's grid evolves and decarbonises – so maintaining reliability is a key tenet of a successful transition. Consistent with this, we are focusing primarily on partnerships and investments in the flexible, dispatchable part of Australia's clean energy transformation with contracts to support growth in renewable energy. These projects are described in this Climate Transition Action Plan. Through our actions to deliver firming and renewables, EnergyAustralia will enable and accelerate the transformation.

Our business centres on our customers and, at its core, our strategy is to make the clean energy transformation simple for them. We are expanding behind the meter customer offerings, and will share our Scope 3 emissions reduction pathway, including customer energy-use emissions, by the end of 2024. We are excited to work with our customers in this way – investing behind the meter is an opportunity to accelerate the clean energy transformation by reducing the need for investments in the grid.

In 2021, EnergyAustralia committed to the accelerated closure of the coal-fired Yallourn power station and mine in Victoria's Latrobe Valley. Yallourn's retirement in mid 2028 will provide a reduction of more than 60% in our Scope 1 emissions (against 2019–20 levels). Coal-fired power station retirements such as this are significant. Through the clean energy transformation, we are committed to a just transition for our workforce, customers and the community. With adequate notice and replacement generation in place, the closure of coal-fired power stations can be orderly and minimise price and supply shocks for customers. Communities and the workforce, with appropriate support and timely engagement, can prepare in advance to achieve a successful and just transition.

In this period of rapid yet still uncertain pace of change, EnergyAustralia's coal-fired power stations will continue to make important contributions to the operation and resilience of Australia's energy system until their retirement. In the case of our Mount Piper coal-fired power station, before retirement, we envisage a transition to a reserve role in the NEM, used only as needed. Such a role will not stand in the way of renewables firming coming into the system. Rather, we see this role as bridging the technology gap until multi-day and seasonal storage is commercially available. The timing of this change is uncertain and is dependent on the broader investment in the energy system underpinned by supportive policy settings. With our ambition to grow our firming and renewable portfolio and to move towards less reliance on coal, this would allow our emissions to decline in absolute terms by over three quarters before 2040 relative to 2019–20 levels. This is equivalent to more than halving the Scope 1 emissions intensity of our portfolio.

We have more to achieve and will continue to pursue our ambition of moving our emissions trajectory closer to 1.5° Paris Agreement alignment. We recognise that the actions and commitments in this Climate Transition Action Plan will change as there is greater certainty in the technology and infrastructure development to support the transition and we will update it, with the next full iteration to be published in 18 months' time.

Every day our people work hard to bring our purpose to life. It is an exciting future based on commitment, actions and a timetable to support the nation's future – one with a Net Zero energy system underpinning a Net Zero Australia.



Jane McAloon AM
Chair



Mark Collette
Managing Director

4. OUR TRANSITION AMBITION

NET ZERO

EnergyAustralia is committed to achieving Net Zero greenhouse gas emissions across Scopes 1 and 2 by 2050, and it is our ambition for this commitment to extend to Scope 3. Our pathway to date is outlined in [Section 6](#) of this Climate Transition Action Plan.



Our commitment is underpinned by our announcement to close the Yallourn power station and brown coal mine. This enables us to reduce our Scope 1 absolute emissions (see [Section 11 – Glossary](#)) by over 60% on 2019–20 levels in 2028–29. In parallel, we will continue to work closely with stakeholders to facilitate a just transition.



We are positioning Mount Piper to enable it to transition to a reserve role which we anticipate being in the early to mid 2030s. This will see its emissions reduced prior to its retirement by 2040. We will reduce reliance on it but maintain its ability to contribute to system stability and the orderly entry and exit of capacity. Its closure by 2040 completes our exit from all coal assets.



We will continue to develop and directly invest in new electricity generation and storage assets, as well as enter contractual relationships (such as renewable Power Purchase Agreements), to create a low-emissions portfolio that supplies energy to our customers.



Working with partners, as outlined in [Section 6.2](#), we aim to expand our renewable portfolio to include up to 3 GW of renewable energy, with a focus on large-scale wind-generation assets. Our ambition is for it to be committed or operational by 2030.



Combined, in delivering these actions, including the operation of Mount Piper in a reserve role, EnergyAustralia's Scope 1 emissions intensity (see [Section 11 – Glossary](#)), which takes into account the efficiency or productivity of the portfolio, will be reduced by approximately 65% relative to 2019–20 levels. Based on the lower emissions intensity, this reduction has the potential to cut our absolute Scope 1 emissions by approximately 75%.



We will work to develop a decarbonisation pathway for Scope 3 emissions, including customer energy-use emissions, by December 2024, and continue to invest in customer solutions that make it simple for customers to decarbonise their energy use.

INTRODUCTION

5. Background

5.1 About EnergyAustralia

EnergyAustralia is one of Australia's largest energy retailers and generators, operating in the east-coast NEM.

Our head office is located in Melbourne, and we have operational assets in Victoria, New South Wales and South Australia.

We are wholly owned by CLP Holdings Limited which is listed on the Stock Exchange of Hong Kong. CLP's Climate Vision 2050 sets out the blueprint for the CLP Group's transition to Net Zero greenhouse gas emissions leading up to the middle of the century. EnergyAustralia's financial results and other disclosures are reported in conjunction with CLP.

We have approximately 1.6 million electricity and gas customers across a mix of household, small business and commercial and industrial customers. As well as supplying centralised energy, we operate a rooftop solar, battery and energy efficiency installation business, currently focused on lighting.

We currently have around 4,500 MW of electricity generation capacity. In addition, EnergyAustralia has the rights to more than 850 MW of solar and wind farm Power Purchase Agreements and owns 50% of the Cathedral Rocks wind farm.

In 2018, we underpinned the revenue for Victoria's first two battery storage facilities at Gannawarra and Ballarat with a combined capacity of 55 MW and storage of 80 MWh. The Ballarat storage facility provides one hour of electricity for 20,000 homes and the Gannawarra facility can power 16,000 homes for two hours during critical peak demand before being recharged.

We have a significant pipeline of development projects, profiled under [Sections 6.2](#) and [6.3](#) of this Climate Transition Action Plan.

Our business employs more than 2,300 people directly to provide customer support, operate and manage our assets and oversee energy projects, offtake agreements and other business functions. We also partner with a range of vendors providing services critical to our operations.

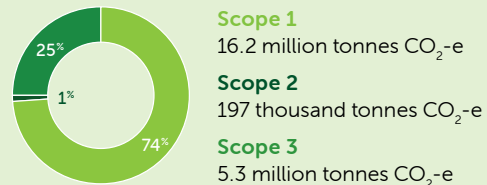
We are proud of the contribution our assets and our workforce continue to make to the economic prosperity of local communities and our nation.

Since 2015, our purpose has been to "lead and accelerate the clean energy transformation for all". Our strategy is to make the energy transition simple for customers, incorporating behind the meter solutions into our growing flexible energy portfolio.

To fulfil these ambitions, our portfolio, services and business activities are evolving, growing and changing and the EnergyAustralia of the future will look distinctly different from the EnergyAustralia of today. We must progressively decarbonise our portfolio, develop compelling offerings for customers and, through the transition, continue to contribute responsibly, as part of our role as a participant in the NEM and a critical input for our customers, to energy system reliability and affordability.

EnergyAustralia's Scope 1 emissions currently contribute under 4% of Australia's annual Scope 1 greenhouse gas emissions, and EnergyAustralia is conscious of the importance of its role in contributing to the reduction of Australia's greenhouse gas emissions. These emissions result primarily from the combustion of coal, gas, fuel oil and diesel at our electricity generation assets, and vary by year. In 2020–21, our Scope 1 emissions totalled 18.7 million tonnes of CO₂ equivalent. In 2021–22, with higher asset outages than is usual, Scope 1 emissions were 16.2 million tonnes of CO₂ equivalent.

Figure 1: Approximate emissions for Scopes 1, 2 and 3



Scopes 1 & 2 emissions calculated in accordance with the National Greenhouse & Energy Reporting requirements and reported to the Australian Government Clean Energy Regulator. Scope 3 emissions referenced in the table above have been estimated using the Greenhouse Gas Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard and associated guidance documents.

Operational assets					
Name of power station	Location	Fuel	Registered capacity	Expected closure date	
Yallourn	Victoria	Brown Coal	1480 MW	mid 2028	
Mount Piper	NSW	Brown Coal	1430 MW	by 2040	
Newport	Victoria	Gas	500 MW	2039	
Jeeralang	Victoria	Gas	432 MW	2039	
Hallett	South Australia	Gas	217 MW	2050	
Tallawarra A	NSW	Gas	440 MW	2043	
Cathedral Rocks	South Australia	Wind	33 MW equity	2030	

Registered capacity can differ from maximum capacity or scheduled capacity for these assets.

5.2 The need for a resilient energy system

The energy system is being remade. As one of Australia's largest energy companies, we recognise our role in the transition and understand the need to manage the impacts on the Australian community as well as the opportunities that come with the transition.

EnergyAustralia shares the national vision of a renewables-dominant energy system harnessing Australia's sun and wind. The clean energy transition, already underway, is positive for our customers, for our transition goals and for Australia's emissions reduction targets. We acknowledge, however, that there is significant complexity involved in providing firming capacity from renewable assets for reliable, round-the-clock supply.

Traditionally, power stations have been fuelled by coal (of different types) and gas, with some power stations engineered for scale without flexibility (generally large coal-fired power stations), and others set up to respond quickly to peaks in demand or a reduction in adjacent supply (generally medium-sized gas-fired power stations). These assets contribute differently to technical grid strength and reliability but provide a predictable source of supply.

Increasingly, with supply from fossil fuel power stations displaced by solar and wind energy, the supply of energy is subject to significantly greater variability. Solar energy is abundant on sunny days, drops when it is overcast and provides no output at night. Wind is subject to natural, seasonal variability and periods of wind drought. The task of matching this supply with customers' demand, itself highly variable and characterised by extremes, is one of significant complexity. This challenge will be more evident as coal-fired and gas-fired power stations retire, manifesting during the stretches of successive still and dark days experienced periodically during winter, and at times of peak demand, for example during heat waves.

During these periods, Australia will need technologies that stretch stored solar and wind resources over more extended periods of time, and sources of energy that can ramp up and down flexibly. We do not yet have all the solutions: it is not yet clear which assets in which combinations will be needed to bridge longer gaps in output from renewable assets, and the policy and market settings needed to support their deployment at scale remain immature. Regardless, the trajectory is clear – consistent with AEMO's ISP Step Change Scenario, the market needs more renewable energy and more electricity storage and renewables firming assets. Critically, it needs long-duration forms of electricity storage. However, it is evident that the longer the duration of the asset, the more challenging the technical and commercial development⁴.

The technology gap should not limit our current ambition. We are investing in renewables firming with a range of durations in electricity storage. In addition, we are working with partners to deliver on our ambition to expand our renewable portfolio to include up to 3 GW of renewable energy, committed or operational by 2030. The fulfilment of these ambitions will see the nature of our portfolio shift materially. This shift is already underway.

EnergyAustralia invests in and operates assets that help build a reliable, stable, decarbonised electricity system that can withstand demand surges and supply shocks.

Our Ballarat and Gannawarra Battery Storage Agreements in Victoria deliver one and two hours of storage respectively, and two hours will be delivered by the co-located batteries at Riverina and Darlington Point in NSW. Our Wooreen battery in the Latrobe Valley in Victoria is planned to provide for multiple hours of storage as will the battery at Mount Piper in NSW, the commitment to which is currently being progressed. Our Storage Agreement with the Kidston pumped hydro-electricity storage facility in Queensland will deliver a capacity of 250 MW for seven and a half hours while our pumped hydro-electricity storage project proposed for Lake Lyell in NSW is expected to provide over 300 MW of electricity for eight hours.

We have invested in these assets to progress the shift in our portfolio. However, in parallel, the current technology gap means there are limits on viable forms of long-duration electricity storage, which will be needed to dispatch energy across longer periods, ensuring system resilience. For the market to bridge the gap, gas-fired power stations have an important transitional role to play in system resilience. Flexible fast-start 'peaking' gas-fired power stations offer certainty of output when it is needed and can ramp down when output is not required, limiting their emissions to critical periods of supply. For now, they are needed to support system resilience and complement expanding renewable capacity. Our construction of the Tallawarra B gas-fired asset will also provide flexible peaking capacity for the NEM. In addition, it is planned that Tallawarra B blend in renewable hydrogen⁵ from 2025 where its supply is commercially viable. EnergyAustralia will offset Tallawarra B's Scope 1 emissions.

In parallel, EnergyAustralia is evaluating emerging technology options for long-duration electricity storage and other technologies to reduce and eventually replace the role played by peaking gas-fired power stations. Over time, we expect such technologies will allow us to transition more completely.

The hardest part of the energy transition for the energy sector is making clean electricity reliably available when it is needed, for all energy customers. We are invested in the challenge.

Storage charges when electricity is abundant, which tends to be when solar and wind power are produced

Electricity storage brings more wind and solar energy into more hours of the day, while renewables firming output spans supply gaps and then steps back when renewable energy is plentiful. Investments in these assets also support energy system reliability and security as renewables continue to increase.

That's why we're taking a leadership position by investing in flexible gas and with the ability to accommodate a 5% renewable hydrogen blend, pumped hydro-electricity and utility-scale batteries, and providing affordable options for customers behind the meter.

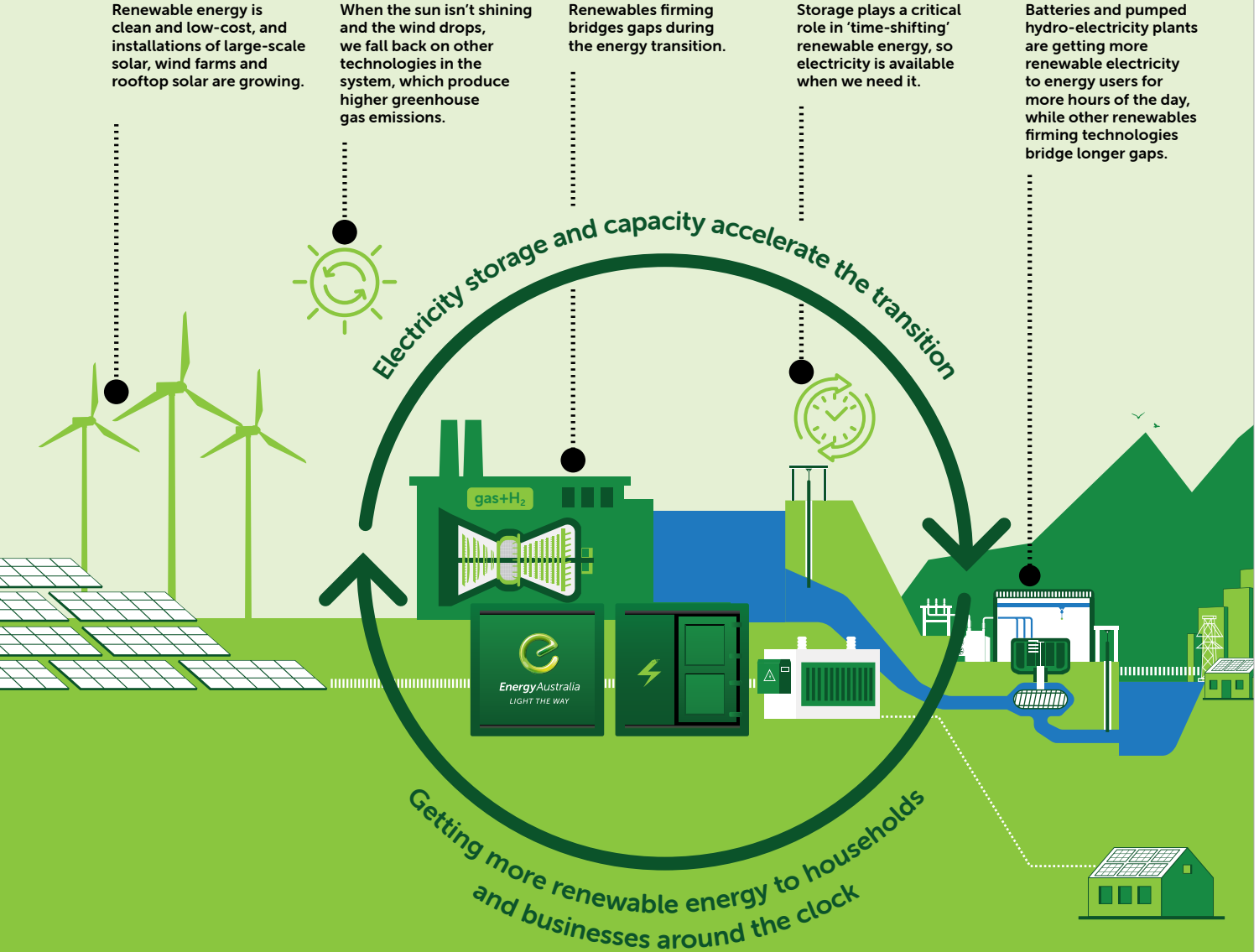
Renewable energy is clean and low-cost, and installations of large-scale solar, wind farms and rooftop solar are growing.

When the sun isn't shining and the wind drops, we fall back on other technologies in the system, which produce higher greenhouse gas emissions.

Renewables firming bridges gaps during the energy transition.

Storage plays a critical role in 'time-shifting' renewable energy, so electricity is available when we need it.

Batteries and pumped hydro-electricity plants are getting more renewable electricity to energy users for more hours of the day, while other renewables firming technologies bridge longer gaps.



Storage charges when electricity is abundant, which tends to be when solar and wind power are productive. It then sends the stored energy into the system when it is needed, displacing higher emissions energy with cleaner energy.



Electricity storage consumes a small amount of energy to charge and discharge batteries or to return water in a closed loop for pumped hydro-electricity.



While this energy is used to calculate Scope 2 emissions, the electricity stored in batteries and pumped-hydro is almost always lower in emissions than the average emissions used in the calculation.

6. Our commitments

6.1 The commitment to decrease our Scope 1 emissions

We are on track to reduce our Scope 1 greenhouse gas emissions by over 60% on 2019–20 levels in 2028–29 underpinned by our closure of the Yallourn power station and brown coal mine. Further, we reaffirm the retirement of our remaining coal-fired power station, Mount Piper, by 2040.

EnergyAustralia is working with stakeholders to contribute to a vibrant and diversified economic future for impacted communities in Victoria's Latrobe Valley and the Central West Region of NSW before and beyond the retirement of these assets. Our approach to supporting our employees and community in the transition is described in [Section 8](#) including, in particular, EnergyAustralia's commitment to retire Yallourn in a way that seeks to provide for a just transition, supported by the \$10 million Yallourn Transition Program.

6.2 Partnering to expand our renewable portfolio to include up to 3 GW of renewable energy by 2030

EnergyAustralia aims to expand our renewable portfolio to include up to 3 GW, committed or operational by 2030, through partnering, with a focus on large-scale wind-generation assets. Currently, we are participating in a range of government-led processes and a series of other discussions to achieve this goal.

Where we purchase output from new renewable energy projects, we will underpin the development of this renewable energy. We may also directly invest in projects to support our ambition. EnergyAustralia expects, with the buy-in of its customers as part of this process (see [Section 10.1 – Assumptions](#)), to accelerate the development of renewable projects and help bring forward the investment needed to support Australia's clean energy transition.

EnergyAustralia's renewable energy purchasing strategy complements its existing strategy to deliver a pipeline of new renewables firming assets needed to support renewable generation. It will help provide our 1.6 million customers with firmed renewable energy.

"We aim to accelerate the expansion of our renewable portfolio to include up to 3 GW of renewable energy, committed or operational, by 2030 with direct investment and PPAs."

MARK COLLETTE, MANAGING DIRECTOR

6.3 Portfolio pipeline and role of Mount Piper to address Scope 1 emissions

The more successful we are in growing our renewables and electricity storage portfolio at speed, the less demand will need to be met by Mount Piper. We will realise this through a range of initiatives including construction, Power Purchase Agreements, Storage Agreements and deployment of Consumer Energy Resources, in parallel with the broader development and investment in the clean energy transition. We see this system transformation occurring progressively.

EnergyAustralia is continuing to develop its pipeline of electricity storage and renewables firming initiatives. We anticipate these initiatives, which include the 665 MW of renewables firming already under construction or nearing operation, will involve the deployment of over \$5 billion in capital by EnergyAustralia and its partners (see [Section 10.1 – Assumptions](#)).

Emissions from coal-fired power stations must be reduced if Australia is to meet its decarbonisation goals. We recognise the importance of reducing our own direct emissions while contributing to system-wide reliability, critical to all customers.

Reducing our emissions does not happen in isolation from the broader energy system – the impact of the transition on customers, markets and the system needs to be taken into consideration. The CSIRO's March 2023 Renewable Energy Storage Roadmap highlights that long-duration or seasonal storage to manage variation in supply and demand, or long-term disruptions to energy supply into the future, will be of key importance. However, of the four key renewable electricity storage technologies (electrochemical (batteries); mechanical storage (pumped hydro-electricity); chemical storage (hydrogen in tanks or pipelines); thermal storage (molten salts)), pumped hydro-electricity is currently the only commercially viable option for long-duration electricity storage, and itself is contingent upon sufficient water availability and specific topographical requirements to provide for long-duration capacity. Therefore, until there are viable forms of long-duration electricity storage that can be put in place, other solutions will be needed to bridge the period until the technology gap is solved.

Further, there is uncertainty about the delivery dates for transmission, renewable and firming projects to facilitate the transition across the NEM. In that context, in the lead-up to its retirement by 2040, our ambition is to progressively reduce Mount Piper's emissions while recognising the role this asset plays in contributing to grid stability in the NEM. This means seeking to reduce the power station's output by shifting the basis of its operation from the continuous supply of electricity to the NEM, to a role, with the appropriate settings, providing renewables firming and technical system services (that are necessary to keep the grid system secure), on a commercial basis, so that it is available to operate when needed. This evolution at Mount Piper is already underway, with investment and modification to allow the power station to run more flexibly.



Kidston pumped hydro-electricity storage facility (under construction)

EnergyAustralia has existing advantages in relation to its project development pipeline.

Our ability to undertake projects on our existing sites or within communities in which our assets currently operate, contributes to the cost-effectiveness of the transition by taking advantage of existing infrastructure, and drawing on existing social licence, important to our intention to remain in these communities. We have projects where operation is imminent, and others in varying stages of development.

Imminently, two batteries, a total of 90 MW and two-hour duration, co-located at Riverina and Darlington Point in NSW, for which we will be the market operator under a Storage Agreement, will commence operation.

The construction of the 316 MW Tallawarra B gas-fired asset was announced in May 2021, and is expected to be ready for the summer of 2023–24. It will operate flexibly, be powered by gas and be designed to accommodate a 5% renewable hydrogen blend⁶. Subject to the commercial viability of the supply of renewable hydrogen in the region, we will work to source 200,000 kg of renewable hydrogen⁷ per year from 2025 and, for the asset’s life, to offset its Scope 1 emissions. We recognise that the industry to support the production of renewable hydrogen is in the early stages of development.

In March 2021, we committed to building the Wooreen battery at our Jeeralang power station – a 350 MW battery that will be built by 2026.

In May 2021, construction commenced on the 250 MW Kidston pumped hydro-electricity storage facility, the first in the NEM in nearly 40 years. We will be the market operator of the plant under a Storage Agreement.

In addition, we are progressing the assessment for and planning of a pumped hydro-electricity storage project at Lake Lyell in NSW.

We have submitted a binding bid to the NSW Government for the development of a utility-scale four-hour, 500 MW battery at Mount Piper.

We are working to advance a development pipeline beyond the announced projects listed above that affords us a significant number of credible growth opportunities.

EMISSIONS AND TARGETS

6. Our commitments (continued)

EnergyAustralia is committed to progressively introducing more renewables and electricity storage.

Amid a market and company shift towards this direction, Mount Piper is expected to increasingly operate in a firming role for renewables, initially reducing output during periods of high renewables generation and then moving to a reserve or backup role. Mount Piper was originally commissioned as a large-scale generator which operated typically at high levels of generation output. We are actively preparing the Mount Piper power station to enable this change to flexible operation. This involves a series of initiatives which target short-duration flexibility as well as removing units from service for a longer duration.

Short Duration: Modification of each generation unit's boilers and combustion configuration has been completed to allow the units, which are rated at peak capacity of 730 MW (unit 1) and 700 MW (unit 2), to be able to generate safely at a very low load of 150 MW, thereby burning minimal coal and producing fewer greenhouse gas emissions. These low load modifications allow the asset to ramp down and quickly ramp up when generation from renewables is low.

A process for 'hot standby' is also being investigated to retain heat within the boiler and turbine, allowing a unit to be turned off and later returned to service through an expedited startup.

Long Duration: EnergyAustralia has implemented a 'wet layup' process which will allow the Mt Piper units to be turned off and stored with water in its boiler tubes in a 'wet' state. We have successfully introduced a product known as 'Anodamine' which is used to minimise corrosion in the boiler caused by water, to protect critical surfaces within the boiler and steam turbine. This allows the unit to be stored, with a return to service within 36 hours when output is required. A generation unit can be stored offline for up to 3 months, without damaging the asset. The team is also developing procedures for longer-term storage known as 'dry layup' where water is removed from the boiler to allow for units to be removed from service for a longer duration.

These initiatives will enable us to reduce output at Mount Piper while retaining the capability to generate within NSW and the NEM at times of renewables shortages and high demand.

Mount Piper Power Station



6. Our commitments (continued)

Combined, the implementation of our renewable energy ambition and our portfolio transition, including the operation of Mount Piper in a reserve role, would build on the absolute emissions reduction from the closure of the Yallourn power station and would facilitate a reduction in EnergyAustralia's total Scope 1 emissions intensity of approximately 65% before Mount Piper's retirement by 2040, relative to 2019–20 levels.

Our outlook suggests that, while the delivery of this pipeline will reduce dependence on Mount Piper, the wider energy system is likely to still require capacity in reserve to provide output that is responsive during key periods of demand in the NEM until such time that long-duration electricity storage is available at scale. This reserve capacity cannot only be provided by existing gas-fired power stations. Additional renewables firming is forecast to be required beyond today's installed gas – the AEMO ISP modelling suggests that the NEM will require 10 GW of gas-fired generation for peak loads and firming by 2050⁸ – and could include existing coal-fired generation operating at a lower output and/or in a reserve capacity as Australia awaits the deployment of long-duration storage. The carefully calibrated use of Mount Piper in this capacity could make an important contribution to system resilience until its retirement by 2040.

Mount Piper is the newest of the NEM's coal-fired power stations in NSW. Our initial assessment indicates good prospects that Mount Piper can perform well under conditions of maximum flexibility and heavily reduced output.

We are early in our evaluation of this shift to the operation of Mount Piper, but understand the challenges that need to be overcome and acknowledge the uncertainty in relation to the timeframe in which this may occur. However, in our view, appropriate market and policy settings will need to be in place to support this approach and to ensure its economic viability, and the implementation of such settings would reflect the obvious merits of the resulting lower emissions from Mount Piper and its anticipated contribution to energy system reliability (see [Section 10.1 – Assumptions](#)).

With good planning and support, we stand to deliver emissions reduction as well as contribute to power system resilience during the critical years of uncertainty through the clean energy transition.

Within the CLP portfolio, we already have examples of coal-fired power generation units operating in a reserve role. In Hong Kong, a plan has been implemented by CLP Power to progressively phase out the daily coal-fired generation at Castle Peak Power Station. Over the last five years, generation from the Castle Peak A Power Station has been progressively reduced in accordance with CLP's Climate Vision 2050 targets, with the generation units to be progressively retired over the next few years as replacement generation becomes available. The operation of Castle Peak A in this reserve role highlights the potential for coal-fired units to operate flexibly to support grid stability at times of shortage, in a similar manner to that expected for Mount Piper.

With good planning and support, we stand to deliver emissions reduction as well as contribute to power system resilience during the critical years of uncertainty through the clean energy transition



EMISSIONS AND TARGETS

6. Our commitments (continued)

6.4 Our approach to gas-fired generation

EnergyAustralia's current portfolio of four gas-fired power stations has represented around 5% of the company's Scope 1 emissions over the past five years.

These assets provide capacity that complements renewable output by operating in periods of low renewable production, periods of peak demand or in periods where there are generation-reliability challenges. They make an important contribution to energy system reliability and resilience, and we currently expect to operate them for their technical lives to support a Net Zero grid, consistent with dates shown in [Section 5.1](#).

Adding to our portfolio, construction is well advanced on the Tallawarra B gas-fired asset. It will operate flexibly and be designed to accommodate a small percentage of renewable hydrogen blended with gas, with Scope 1 emissions offset for the asset's life.

Subject to the commercial viability of the supply of renewable hydrogen in the region, for both Tallawarra A and B, EnergyAustralia will work to source an initial 200,000 kg of renewable hydrogen per year from 2025, while recognising that the industry to support the production of hydrogen is in the early stages of development. We are targeting a 5% blend which is equivalent to around 2% emissions reduction measured against Tallawarra B. We will carry out studies to assess the feasibility of increasing our blend, targeting incrementally higher renewable hydrogen blends.

It is well understood that electricity storage adds to power system stability and results in more wind and solar energy being used during more hours of a given day.

More broadly, where it is possible and commercial to use hydrogen in its gas-fired power stations, EnergyAustralia commits that it will only use renewable hydrogen in the hydrogen blend. We will offer to buy only hydrogen produced through electrolysis powered solely by electricity supplied from an "eligible renewable energy source", or with equivalent "large-scale generation certificates" as defined in the *Renewable Energy (Electricity) Act 2000* (Cth), or in the future, Renewable Electricity Guarantee of Origin certificates.

In addressing the Scope 1 emissions from the asset's operation, EnergyAustralia has committed under its funding arrangements to purchase offsets over the asset's life, with a commitment to using Australian Carbon Credit Units to do so until at least the end of 2030. However, outside of the Tallawarra B example, EnergyAustralia's approach is that it does not use carbon offsets to delay or diminish the work we are doing to invest in clean energy assets, which will directly decarbonise our operations. We continue to evaluate options for long-duration electricity storage and other technologies that can store electricity across weeks and seasons to reduce and eventually replace the role akin to long-duration storage played by our gas-fired power stations.



Construction of Tallawarra B gas-fired asset with the ability to accommodate a 5% renewable hydrogen blend

6.5 Our approach to Scope 2, electricity-use emissions

EnergyAustralia's Scope 2 emissions are relatively small, totalling less than 1% of company emissions. They currently result primarily from maintenance works at EnergyAustralia's power stations while they are offline and are not producing their own power. With the closure of the Yallourn power station and mine in mid 2028, over 68% of EnergyAustralia's Scope 2 emissions on 2019-20 levels will cease.

Scope 2 emissions intensity continues to decline as the NEM decarbonises, with a 5% average reduction per year over the past three years (2020-22), based on AEMO data. Over time, EnergyAustralia's Scope 2 emissions are expected to reflect the business's increasing use of utility-scale batteries and pumped-hydroelectricity storage assets, and the electricity consumed in each charging or pumping cycle, rather than power station electricity imports, and accordingly, be reflected in an increase in Scope 2 emissions.

It is well understood that electricity storage adds to energy system stability and results in more wind and solar energy being used during more hours of a given day. Such assets are expected to predominantly charge during periods of abundant renewable energy supply and will tend to displace higher emissions sources when they supply the grid. By bringing more renewable electricity to more customers, they will contribute meaningfully to the decarbonisation of the NEM. However, their use may cause a temporary, and correspondingly smaller increase in EnergyAustralia's future reportable Scope 2 emissions until such time as NEM decarbonisation in turn lowers the emissions associated with grid electricity usage.

EnergyAustralia will provide updated Scope 2 guidance in future disclosures as the size, construction and operational control settings of the growing electricity storage portfolio matures.



EMISSIONS AND TARGETS

6. Our commitments (continued)

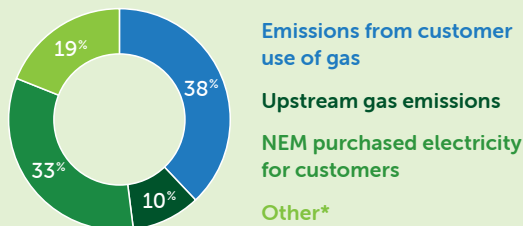
6.6 Our approach to Scope 3 emissions

Both the decarbonisation of our Scope 3 emissions and assisting customers with their own decarbonisation ambitions are important to EnergyAustralia.

EnergyAustralia's Scope 3 emissions comprise over a quarter of the company's total Scope 1, 2 and 3 emissions. Over 80% of these Scope 3 emissions relate to the use of gas and electricity sold to our household, business and commercial and industrial customers as illustrated in Figure 2 below. These Scope 3 emissions from the use of gas and electricity by our customers represent a customer's Scope 1 and 2 emissions respectively, and therefore our decarbonisation ambition and that of our customers is linked.

Our Scope 3 emissions are mostly dispersed across our 1.6 million customers, and the largest proportion relates to emissions from customer use of gas (38% as per Figure 2 below). Each customer's circumstances, choices and actions influence their level of energy efficiency, energy use and their level of electrification. Each of these factors impacts our Scope 3 emissions. While emissions intensity from electricity purchased for customers will reduce over time as the NEM decarbonises, EnergyAustralia has an important role to play in working with customers in relation to gas emissions, by bringing market-credible product offerings that customers value, and that encourage them to reduce their energy-use emissions.

Figure 2: EnergyAustralia's Scope 3 emissions



*Upstream emissions from fossil fuels used in power generation, upstream emissions from goods & services and downstream emissions associated with waste.

We remain at the beginning of our journey to decarbonise our Scope 3 emissions. However, we are taking the challenge seriously. We commit to developing and publishing our decarbonisation pathway for Scope 3 emissions, including customer energy-use emissions, by December 2024.

We will develop a decarbonisation pathway for Scope 3 emissions by December 2024, and will continue to invest in customer solutions that make it simple to decarbonise their energy use.

We estimate that 19% of our Scope 3 emissions occur in categories outside of customer usage, with the majority relating to the supply of coal for the Mount Piper power station, gas purchased for use across our gas-fired power stations, and the treatment and recycling of ash from Yallourn and Mount Piper. Where these emissions relate to Mount Piper and Yallourn, they will reduce over time as output reduces and the assets are retired. This includes approximately 5% of our Scope 3 emissions which relate to the upstream activities associated with capital and operational expenditure for goods and services purchased for EnergyAustralia's business operations and projects.

6.7 Our approach to customer energy-use emissions

Carbon offset energy

EnergyAustralia uses carbon offsets for specific purposes and has followed this approach since launching its Go Neutral program to residential customers in 2016, and since 2020, offering an electricity carbon offset product to its business customers. Carbon offsets offer customers an opportunity to offset the carbon footprint in relation to energy supplied from the grid to them by EnergyAustralia. Carbon offsets are not used by EnergyAustralia to delay or diminish the work we are doing to actively decarbonise, noting that in the context of our Tallawarra B project (see [Section 6.4](#)) Australian Carbon Credit Units will be used to offset its Scope 1 emissions.

We recognise the positive contribution that quality offsets make in reducing atmospheric carbon emissions, noting that some businesses are dependent on gaseous fuels and face significant barriers to electrification, improving their energy efficiency, and accessing more renewable electricity. For this reason, we support their use.

EnergyAustralia offers Climate Active-certified electricity and gas products for customers of all sizes that have opted in. This means that we purchase vetted carbon offset certificates to offset the emissions associated with the usage of energy by these customers in their homes and businesses. EnergyAustralia buys only accredited international offset certificates derived from projects reviewed by our external assessors, and smaller volumes of Australian Carbon Credit Units consistent with the Climate Active program, our internal trading policy documents, and the advice of external assessors engaged by EnergyAustralia to undertake vetting and quality assessment.

6. Our commitments (continued)

Currently, around a quarter of our residential customers receive carbon offset energy as part of our Go Neutral program. To date, EnergyAustralia has selected and purchased offsets equal to over 6 million tonnes of greenhouse gas emissions for its residential and business customers.

Helping our household and small business customers decarbonise

We already offer our customers solutions that make their participation in the clean energy transition simple. We are building on existing customer packages and piloting new, innovative approaches.

We are helping households to reduce their electricity use emissions by offering:

- quality rooftop solar installations through our fully owned installation business, following our 2020 acquisition of the Echo Group
- EnergyAustralia's Solar Home Bundle, through which household customers in NSW can install rooftop solar and battery systems with no upfront costs
- PowerResponse, which is a voluntary demand response program that rewards customers for reducing their electricity usage during nominated peak times. Customers can either opt in to receive notifications at key times to reduce their usage to receive bill credits or can join the Power Response Virtual Power Plant to automate their participation if they have a battery.

EnergyAustralia also offers customers access to renewable energy certificates under the Federal Government-backed GreenPower program. Customers can elect to fund the purchase of certificates equivalent to their energy consumption, or a nominated share of it, and EnergyAustralia ensures that the corresponding volume of renewable energy certificates are purchased.

The emissions intensity of the grid that supplies all electricity to customers is reducing over time, as the mix of energy produced reflects the growing share of renewable energy. The NEM has decarbonised around 5% per year over the past five years, and so too have customer emissions per unit of energy consumed. This trajectory, coupled with the higher efficiency of electric appliances, is making electrification central to the decarbonisation of energy use.

EnergyAustralia intends to develop capabilities and product offerings that help its customers progressively substitute the use of gas with the more efficient use of electricity, and we acknowledge the Victorian Government's recent announcements prohibiting gas connections to new homes in this context. This is a complex transition and must respond to customer preferences and affordability challenges. EnergyAustralia is developing trials prioritising the deployment of heat-pump hot water units, aiming to gain insights and data to inform the design and delivery of future packages.

The recent report from the Grattan Institute, 'Getting Off Gas', champions the shift towards electrification⁹. This report outlines the limitations of hydrogen as a substitute for gas in a household context and therefore the current limitations of its role in decarbonising emissions from the use of gas. EnergyAustralia shares a similar perspective and while we recognise that there is longer-term consideration of blending biomethane or hydrogen in the gas network, hydrogen blending is currently only tested to around 10% in the reticulated network^{10,11}. Even with 20% hydrogen blending¹² the associated emissions reduction would be capped at around 7% owing to hydrogen's lower energy content.

With the Solar Home Bundle, customers pay a fixed usage rate for electricity regardless of whether the energy they use comes from the solar panels or battery, or from the grid.

Once the system is installed, software delivers electricity to the customer from the system or the grid, and we manage it as part of our Virtual Power Plant – a network of batteries that helps to support grid stability. After a seven-year contract period, ownership of the system is transferred to the customer.

The Solar Home Bundle is now available to eligible households in NSW with annual electricity usage above 6,000 kWh. We are looking at ways to bring this offer to customers in other states.

The evolution of network tariff structures (which only change every five years and impact the costs borne by customers) have not kept pace with product innovation, the outcome being that customers are, in many cases, unable to realise the material benefits available to the grid from innovative products. EnergyAustralia will continue to engage with governments and regulators to advocate for the necessary changes to support customers' decarbonisation.



EMISSIONS AND TARGETS

6. Our commitments (continued)

Helping our Commercial and Industrial customers decarbonise

Commercial and Industrial customers (C&I customers) have diverse operational requirements, but many share a common dependence on high volumes of energy for their businesses. EnergyAustralia offers these customers bespoke guidance and product offerings that support their own decarbonisation ambitions.

EnergyAustralia supports our C&I customers to source their renewable energy either from our portfolio of Power Purchase Agreements or via their own market-sourced offtakes, or a combination of the two. We have developed a progressive purchasing product, PurchasePro, for large C&I customers which enables them to match renewable energy with their needs. We also have the capacity to add firming contracts, leveraging EnergyAustralia's portfolio of flexible-capacity assets such as utility-scale batteries, so that our C&I customers will not find themselves exposed to high spot-market energy prices when they require electricity but their sources of contracted renewables are not producing it.

We also work with C&I customers to define and evaluate business cases for commercial-scale solar and battery installation. Customers are referred to our fully owned specialist commercial-scale installation business for delivery of these systems.

Energy efficiency and behavioural change are other key areas of innovation for our C&I customers. InsightsPro is EnergyAustralia's data portal that enables C&I customers to gain insights into their electricity usage through the provision of consumption data, cost breakdowns and carbon-emissions tracking. This provides customers with better visibility of their energy use and gives them the opportunity to reduce their emissions profile by changing their usage to periods during which there is higher renewable energy output (and/or lower prices). Without good, reliable data insights and visualisation tools, customers cannot make informed decisions about how, when and what they can do to manage their energy consumption and costs therein.

Similarly, our ResponsePro (demand response) program rewards customers for reducing their electricity usage during nominated peak times. As with the household and small business package, C&I customers can opt in to receive notifications during certain events and be rewarded in bill credits.

Decarbonisation is increasingly a key driver for C&I and EnergyAustralia is assisting these customers with a variety of approaches to reduce their carbon emissions while simultaneously delivering their energy needs. Where C&I customers operate high-heat processes that depend on the use of a gaseous fuel, the blending of biomethane or renewable hydrogen can be explored. In other circumstances, customers may be able to implement solutions to electrify their gas use and achieve reduced emissions intensity. These types of solutions are likely to be technically specific to a customer's process and EnergyAustralia's role would be to facilitate access to renewable electricity as part of this decarbonisation path.

EnergyAustralia can support customers' further decarbonisation through the installation of behind the meter solar and battery systems.

Electric Vehicles

EnergyAustralia has developed and is in the early stages of rolling out to market a commercial green transport package, supporting business and C&I customers with the installation of Electric Vehicle charging systems to power their fleets. This offering will help these customers participate in higher efficiency, lower-emissions transportation, with lower emissions per kilometre from grid-charged vehicles over their lifetime relative to equivalent vehicles with internal-combustion engines. EnergyAustralia's ambition is an offering which is able to help customers further decarbonise over time, by powering a portion of their vehicle charging from solar and battery systems and participating in EnergyAustralia's Virtual Power Plant.

EnergyAustralia land holdings surrounding the Yallourn power station



Our current approach begins by targeting fleet customers such as bus depots along with customers such as petrol stations, shopping centres and recreation sites with public charging facilities.

Over time, operators of electrified fleets of vehicles can benefit from the continuing decarbonisation of the electricity they access for charging from the grid as the NEM continues to decarbonise, with decreasing electricity consumption as vehicle efficiency continues to improve, and from lower emissions where they invest in growing the deployment of behind the meter solar and battery systems. EnergyAustralia's offerings makes it simpler for fleet operators to make the switch to electrified fleets.

6.8 Biodiversity and environmental impacts

EnergyAustralia acknowledges the work of the Taskforce on Nature-related Financial Disclosures to develop a management and disclosure framework for reporting and acting on evolving nature-related risks. We recognise the twin crises of global warming and the broader destruction of biodiversity and nature and seek to respond conscientiously. EnergyAustralia intends to work towards reporting in accordance with the Taskforce on Nature-related Financial Disclosures framework after it is finalised in 2023.

In addition, we maintain environmental controls across our assets which are designed to minimise environmental impact and support environmental stewardship. We expect to focus more on our nature-related dependencies and impacts and are in the early stages of consideration of what will be required. This remains an area of focus as we approach the rehabilitation of older assets, and as we work responsibly to develop new power system assets.



EnergyAustralia strives to reduce the impacts on biodiversity through habitat restoration programs and using biodiversity offsets that are assessed and protected through State and Federal legislation.

At Yallourn, EnergyAustralia rehabilitated 34.4 hectares of land within the mine area in 2022 by establishing native seed or pasture grass to vegetate exposed landforms. With the Yallourn power station scheduled to close in mid 2028, EnergyAustralia has embarked on the development of rehabilitation and remediation plans for both the Yallourn power station and mine, aimed at repurposing to provide local amenities for community development including conservation and recreation areas.

At Mount Piper, EnergyAustralia recently established a Biodiversity Conservation Agreement with the New South Wales Government over a parcel of land adjacent to the Thompson Creek Dam. The Agreement guarantees the protection of the native vegetation and habitat on the land from clearing and future development, even if the property is sold.

7. EnergyAustralia's decarbonisation pathway

EnergyAustralia's electricity generation assets are part of an interconnected system and respond to market needs when available to generate. As a result, asset output volumes and resulting emissions reflect the market conditions that provide demand signals for their dispatch. Depending on customer electricity demand, prevailing weather conditions and the extent of shortfalls in other producers' output, the electricity volume we send out and the source of that electricity from our portfolio can fluctuate significantly, with annual emissions projections subject to associated uncertainty.

Our plan to build out our future portfolio of renewables firming assets and renewable energy, and our vision to be able to reduce the overall volume of electricity produced at Mount Piper in the lead-up to its retirement by 2040 (as discussed in [Section 6.3](#)), is accompanied by anticipated absolute emissions and emissions intensity reductions.

The extent to which Mount Piper will be required to operate and provide essential generation and system services during the 2030s remains uncertain, and is dependent on the availability of firming renewables in the NEM, allowing Mount Piper to increasingly play a reserve role. This uncertainty impacts our portfolio emissions intensity forecasts.

To evaluate our Scope 1 portfolio emissions and pathway to Net Zero, we have determined the reference emissions for each asset from representative historic years, rather than overlaying assumptions and predictions for demand variability and generation output at each asset into the future. We have taken the median emissions for each asset over the five most recent reporting years and carried this forward until planned actions effect change. We expect that this approach provides a conservative outlook as it has less sensitivity to the decreased emissions from our coal assets which have been impacted by outages and coal supply challenges in recent years. Given this approach, in the future actual emissions may average lower than forecast as growing renewable energy output displaces the output from fossil-fuel assets.

This data have been used to model a series of scenarios which reflect the entry of renewables firming capacity and up to 3 GW of renewable energy, and the transition to a reserve role for Mount Piper. The timing at which Mount Piper can transition to a reserve role is dependent on the speed of the NEM decarbonisation, including the deployment of transmission infrastructure, renewables and renewables firming. The timing of the reserve role also depends on the availability of commercial long-duration storage technology. The reserve role is likely to be feasible once there is sufficient short-duration storage and renewables to maintain electricity supply through most weather conditions across the NEM in a year.

The Scope 1 portfolio decarbonisation pathway, as shown in Figure 3, presents two indicative projections which show different rates of our emission intensity decarbonisation. The rate at which our portfolio emissions intensity falls is dependent on the extent to which Mt Piper is relied upon to operate to support grid strength and system reliability, noting the significant uncertainties in this regard that are outlined. The modelled emissions do not include the year-to-year variability of individual asset generation. In addition, the historic reference data have been used represents a conservative approach. The progressive operation of the up to 3 GW of renewable energy is modelled on estimates current at the time of the publication of this Climate Transition Action Plan.

Comparison to AEMO's 1.8°-aligned decarbonisation pathway

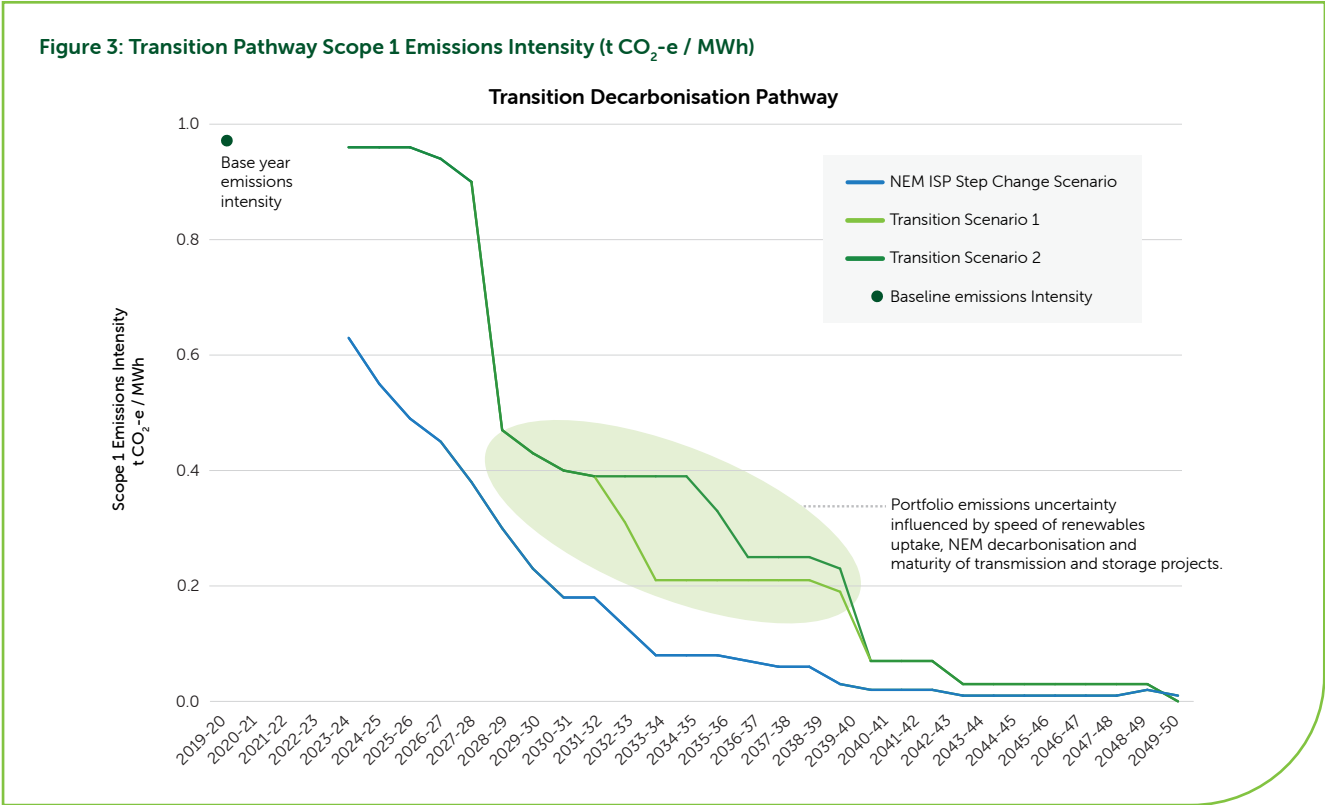
The clean energy transition is progressing faster than previously predicted, and we track our pathway against the outlook contemplated in AEMO's ISP Scenario 3, Step Change. AEMO's scenario is 1.8° aligned and consistent with keeping global warming well below 2°. The rate of change anticipated by this scenario is significant and its success is not assured.

The two AEMO ISP scenarios that align with 1.5° Paris Agreement ambitions, the Strong Electrification Sensitivity Scenario and the Hydrogen Superpower Scenario, require all NEM coal-fired power stations to be closed by the 2031–32 financial year. However, based on the current market outlook in relation to the closure of coal-fired power stations and the need for long-duration electricity storage and transmission infrastructure to come online, it appears unlikely that the broader NEM will decarbonise on a trajectory consistent with a 1.5° pathway as outlined in these scenarios. This does not mean that the market should abandon efforts to get as close as possible. But in pursuing these efforts, we acknowledge the structural issues that may impact the ability to do so.

The retirement of coal-fired power stations in this timeframe would require replacement-level volumes of renewable energy and renewables firming to be operating in the NEM, and the level of uncertainty currently makes it challenging to have strong confidence that this will occur.

The deployment of 1.5°-aligned volumes of renewable energy is dependent on the construction of new transmission lines, including across state borders, with growing evidence of delays to the pipeline of projects. Over the last year, the target connection date for the NSW Central West Orana Renewable Energy Zone has been deferred from July 2025 to September 2027, and the route of the Victoria to NSW Interconnector West path is still being refined, risking delays to the commencement of the Western Victoria Renewable Energy Zone due by July 2026.

Figure 3: Transition Pathway Scope 1 Emissions Intensity (t CO₂-e / MWh)



Importantly, long-duration electricity storage may not be available to contribute to system resilience in sufficient quantities to provide for 1.5°-aligned coal-fired power station closures. There remain several significant government policy initiatives and frameworks yet to be finalised to enable the faster uptake of long-duration renewables firming as described in [Section 9](#). In early May 2023, it was announced that the commercial operation of Snowy 2.0 has been further delayed (and is now expected between December 2028 and December 2029).

Higher technology and construction costs and supply chain constraints are also impacting the roll-out of infrastructure and projects with AEMO's draft transmission options for the 2024 ISP showing upward cost revisions from the 2022 estimates. This reinforces the difficulties in delivering the 1.5°-aligned scenarios.

The February 2023 Update to AEMO's 2022 Electricity Statement of Opportunities highlighted the power system reliability challenge resulting from the next three coal-fired power stations in line to retire. Expected Unserved Energy continues to be forecast greater than the reliability standard from 2027–28 in NSW, increasing further from 2029–30 when the Vales Point power station is expected to retire. We believe that these retirements can be managed through the deployment of new assets across the NEM but understand that further closures, as required for 1.5° alignment, would expose the NEM to further risks to reliability.

For these reasons, our decarbonisation scenario analyses are plotted against this 1.8°-aligned pathway.

AEMO ISP Step Change Scenario Scope 1 emissions intensity is calculated from AEMO's Candidate Development Path 2 workbook with AEMO's 'Distributed PV' component removed. While not yet operating, EnergyAustralia Tallawarra B future emissions and output have been estimated and included in the EnergyAustralia Transition Pathway Emissions Intensity – indicated above. EnergyAustralia intends to offset the Scope 1 emissions associated with this asset over its life.

The delivery of NEM decarbonisation consistent with 1.8° alignment remains an ambitious undertaking and is subject to a wide range of policy, market, economic and technology dependencies. The scale of investment required is enormous, and the success of the pathway is not assured. EnergyAustralia's decarbonisation pathway is similarly subject to wide-ranging factors and risks. Our assumptions and risks are outlined in [Section 10](#).

We acknowledge that the decarbonisation efforts described within this Climate Transition Action Plan do not yet align our portfolio emissions intensity with the NEM average shown in AEMO ISP's 1.8° pathway (noting estimates for EnergyAustralia's assets are included in this NEM average). EnergyAustralia will continue to pursue portfolio development projects, investments and innovations that move us closer to this benchmark. We will update this Climate Transition Action Plan with our revised forecasts as further information becomes available, and within 18 months.

8. Fairness

8.1 Responsible Yallourn transition

EnergyAustralia is committed to operating responsibly and demonstrating long-term commitment to the communities in which we operate. Where asset retirement is planned, we will engage affected communities early and strive to deliver a responsible and fair transition for workers and impacted communities, and will manage rehabilitation carefully with an aim to achieve sound environmental outcomes.

The Yallourn power station and mine have helped power Victoria for over a century and both will retire in mid 2028. Yallourn is maintained by a highly skilled workforce, with over 500 permanent employees, and workforce numbers increasing up to 1,000 during major maintenance activities. EnergyAustralia acknowledges the achievements of its workforce and their supporting communities in delivering reliable power to Australians.

When EnergyAustralia committed to retire Yallourn we did so in a way that sought to provide for a just transition. We approached the Victorian Government seven years in advance with a plan for closure including replacement capacity. The plan also included support for the workforce to transition, which has resulted in the \$10 million Yallourn Transition Program.

By providing seven years' advance notice of the retirement of the Yallourn power station, EnergyAustralia is able to collaborate with the Yallourn workforce, the community, Traditional Owners, unions, and other stakeholders towards a just transition. We look forward to working productively with the newly formed National Net Zero Authority, and to engage on frameworks for a best-practice just transition.

The program supports all workers with long-standing ties to Yallourn, including contractors, with access to services to plan, prepare and, where desired by our people, upskill for the future.

About 60% of the Yallourn workforce has indicated a desire to continue residing in the Gippsland region beyond the closure of the Yallourn power station. Recognising this, EnergyAustralia is exploring partnerships with potential future employers in the region to create transition pathways for secondments and employment. One example is with the offshore wind industry where we are collaborating with local education providers to map the skills from coal-fired power stations to the offshore wind industry. Analysis conducted by ATLAS (a leading recruitment firm) suggests that over half of the skills required for roles in the offshore wind sector are present in roles at coal-fired power stations.

More broadly, our construction of the Wooreen utility-scale battery by 2026 will provide an economic boost to the Gippsland region. It will enable more renewable energy produced in the region to enter the grid and will continue the Latrobe Valley's history of powering business, industry and communities.

Rehabilitating the Yallourn power station and mine

On the retirement of the Yallourn power station and mine in mid 2028, EnergyAustralia's intention is to remediate the surrounding area to enable future community use, with areas dedicated to amenity and enriching environmental outcomes.

EnergyAustralia's objective is to deliver a positive legacy by supporting the repurposing of the site to provide both community assets and opportunities for future economic development and jobs in the region and EnergyAustralia is actively investing resources in exploring credible repurposing opportunities.

While finalising the parameters for rehabilitation is some years away and will involve significant levels of engagement with government and other stakeholders, EnergyAustralia's ambition for Yallourn is to work towards the creation of a multi-purpose useable community space by converting the mine into a lake interconnected with the adjacent Morwell and Latrobe Rivers. This approach will be designed to deliver a safe and stable landform which minimises impacts to the environment through the prevention of uncontrolled fires and major mine failures.

Rehabilitation at Yallourn has already commenced. During the past 20 years, more than 300,000 plants of 100 different species have been planted with the goal of creating an environment that attracts native birdlife and, in the lake, aquatic species. Part of the site, which will be surrounded by native bush, woodland and wetlands, could provide recreational access and amenity to the community.

8.2 Supporting our local communities

EnergyAustralia seeks to work constructively and respectfully alongside local communities including workers and their families, the community and interest groups and Traditional Owners.

We play an active role through volunteering, workplace giving and social investment in the communities in which we live and work. Our Community Grants program makes available grants of up to \$10,000 at our power stations and Geelong contact centre. This funding enables organisations such as community groups and schools to run social programs and purchase resources to enable better community outcomes. In 2022, we supported 85 organisations around our sites to deliver projects and programs into their local communities.

As part of our workplace-giving program, donations are made to our nine charity partners through pre-tax donations and those amounts are matched by EnergyAustralia. We have one of the highest participation rates in Australia and, as of July 2023, have donated over \$2 million under the program in less than five years.

Our people receive two days of paid volunteering leave each year. In 2022, our people spent over 2,000 hours out in their local communities. To extend our support further, our Community Champs organised an End of Year Giving Appeal. Our people donated 575 new items to St Kilda Mums and Geelong Mums, and \$7,000 worth of toys to families in the Latrobe Valley as part of the Gippsland Motorcyclists Christmas Toy Run.

Around Yallourn, we have established a partnership with The People's Kitchen, which is part of the Morwell Neighbourhood House. EnergyAustralia's workplace giving donations from staff located across the business fund the purchase of the ingredients needed for the program and once a month, members of the Yallourn workforce volunteer to prepare healthy meals for the local community. Over the past two years, EnergyAustralia has prepared more than 1,400 meals and provided \$36,000 in donations to the program, supporting its ongoing operation.

With over 100 goods and services suppliers to Yallourn we will continue to look for ways of increasing the use of local suppliers and recruitment of local people for local job opportunities as a signatory to the GROW Gippsland Compact.

8.3 Supporting our customers

All customers need to be able to access energy and related services fairly, equally and reliably. Through our participation in the industry's voluntary Energy Charter, we commit to working with other energy-sector participants and bodies to improve support for customers experiencing economic vulnerability.

Increases in the cost of living remain challenging for many Australians. To support households facing short-term financial difficulties, we continue to offer payment plans and payment extensions, and provide information on government assistance that is available to customers. For customers impacted by financial hardship, assistance is available under our EnergyAssist hardship program. The program helps customers by offering additional tailored solutions which can include tailored payment plans, payment matching and debt waivers, as well as energy-efficiency education to ensure that customers are well informed in making decisions that impact their energy consumption. Since May 2022, we have increased the number of staff working to support our vulnerable customers by approximately 65% and increased the financial support to those customers by approximately 60%.

We have also partnered with various organisations to work directly with customers in financial hardship and improve their energy efficiency:

- We are a member of the One Stop One Story Hub Partnership, which helps support people facing family and domestic violence or financial hardship to navigate support programs by reducing the need for multiple interactions.
- We have partnered with Uniting Energy Audits to provide customers with energy-efficiency information via a home or phone audit, to lower energy consumption and bills.
- We have also partnered with The Good Guys to assist with the delivery of new appliances and the removal of old as part of our appliance swap program.

Our business customers can also access support through our Rapid Business Assist program, launched in 2020, to support small to medium enterprises facing financial uncertainty. In consultation with these customers, we develop customised payment schedules and provide advice on lowering energy consumption, as well as guidance on accessing government energy-relief subsidies.

8.4 Reconciliation

In January 2023, EnergyAustralia launched its second Innovate Reconciliation Action Plan, our third overall, in which we have committed to promote reconciliation and cultural understanding, and enhance relationships with Aboriginal and Torres Strait Islander Peoples and organisations. This year, members of our workforce have spent time on Country in Gippsland, Victoria, and Lithgow, NSW, engaging in local cultural learning. These sessions provide our people with closer working relationships with local Traditional Owners and Custodians, as well as enhanced understanding of local history and our sites' and projects' connections with, and impacts on, Country and our First Peoples.

8.5 Our approach to asset development

As we invest in new assets, working collaboratively with local communities is vital to our success.

EnergyAustralia is a signatory to the Clean Energy Council's Best Practice Charter for Renewable Energy Projects, which outlines commitments that communicate the standards to be upheld in the development of current and prospective renewables firming and renewable development projects. Consistent with this Charter, EnergyAustralia expects to share the benefits of its projects with host communities.

The following principles for benefit-sharing reflecting the Charter will be applied to all EnergyAustralia large-scale projects:

- **Aligned** – Benefit-sharing should be clearly linked to the project's business case and objectives and tailored to reflect known social needs and risks.
- **Proportionate** – The value of allocated shared benefits is proportionate to known direct and indirect community and individual impacts.
- **Sustainable** – Benefit-sharing initiatives are structured to deliver positive, quantifiable impacts for the host community that are self-sustaining in the long term (equivalent to the lifespan of the asset).
- **Collaborative** – Multiple community stakeholders are actively consulted when considering options for benefit-sharing to ensure that chosen projects accurately reflect and respond to host-community interests, expectations and needs.

Collaboration is currently underway as part of the design and planning for the Lake Lyell project. To date, a range of avenues to involve community stakeholders in the development of the project have been provided, seeking stakeholder feedback on limiting the impacts of the project. This feedback has directly informed changes to the project's design, including locations for key infrastructure and biodiversity considerations. This active consultation will continue to ensure that benefit-sharing is consistent with the Charter.

8.6 Supply chains

Fairness through the clean energy transition extends to EnergyAustralia's suppliers as part of the commitment to ethical, just and responsible procurement. Suppliers are assessed on multiple Environment, Social and Governance criteria to identify both risks and opportunities. For example, EnergyAustralia has partnered with one of its largest suppliers to develop contractual clauses and benchmarks to provide for First Nations participation to enhance their employment and business-development opportunities. These clauses are being incorporated in new contracts. More recently, EnergyAustralia stepped in to provide job and financial security to contractors working to construct the Tallawarra B gas-fired asset following the collapse of the Clough group. EnergyAustralia's third Modern Slavery statement, produced in accordance with the *Modern Slavery Act 2018* (Cth), was submitted to the Federal Government in June 2023.



Smoking ceremony at our Geelong contact centre

9. Operational alignment to support the Climate Transition Action Plan

9.1 Governance

Sustainability, including our response to climate change, is integrated into EnergyAustralia’s corporate-governance structures and, as stated, is a core pillar of EnergyAustralia’s purpose.

The EnergyAustralia Board has overall responsibility for the governance of the organisation and provides leadership and strategic guidance relating to the development and implementation of the corporate strategy. This includes the sustainability strategy, targets and outcomes, and opportunities and investments relevant to the clean energy transition. This is evidenced through our EA2025 strategic goals, which include investing in flexible generation and electricity storage to firm renewables, and the activities being undertaken to repurpose the Yallourn mine site.

The Board is made up of nine directors, including three directors from our parent company, CLP Holdings Limited. The Board members bring experience from a wide range of industries and backgrounds, including utilities, oil and gas, construction, industrials, retail, marketing, finance, insurance and government and policy. The Board further develops its skills through seeking input from members of management and regularly invites independent advisers and relevant industry and subject-matter experts to inform them of the latest market and industry developments, including climate risk. The three CLP-nominated directors on the Board also ensure that EnergyAustralia’s shareholder’s views and approach to climate transition, set out in CLP’s Climate Vision 2050, are taken into account and an aligned approach is reached.

The Board Sustainability Committee assists the Board in overseeing the CLP Group’s climate change, decarbonisation and energy system transformation performance and governance responsibilities. In February 2022, the Board approved an expanded Charter, with greater emphasis on ESG matters, and a change of name from the Board Health, Safety, Security and Environment Committee to the Board Sustainability Committee.

EnergyAustralia’s Executive Sustainability Committee was formed in December 2021 and comprises all members of EnergyAustralia’s Executive Leadership Team. It is chaired by the Managing Director, Mark Collette.

The diagram below illustrates how EnergyAustralia’s response to climate-change considerations is integrated into its corporate governance structure.

Consistent with the recommendations of the Financial Stability Board’s Task Force on Climate-related Financial Disclosures, EnergyAustralia maintains climate-risk scenarios that are subject to quarterly evaluation.

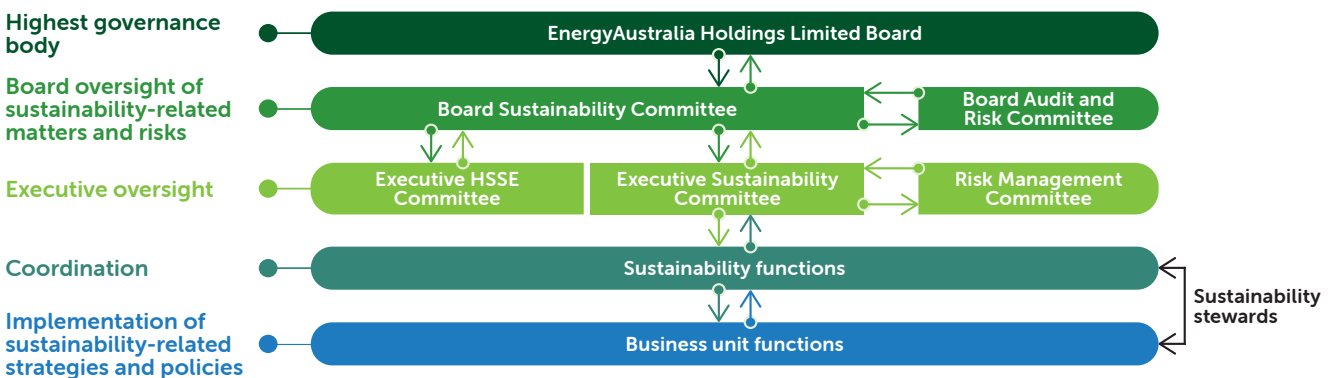
These risks include scenarios relevant to the speed and volatility of the clean energy transition and risks arising from operating in a physically changing climate. We consider the company’s activities against changes in policy and regulatory settings, competitor behaviour, legal and regulatory developments and counterparty expectations.

EnergyAustralia has tested its climate-related risks against future temperature conditions that include 1.5°, less than 2° and 3–4° warming scenarios, and considered the multiple potential impacts to business activities within each threshold. These have been assessed and refined with the assistance of external environmental advisory services.

The risks are managed through EnergyAustralia’s enterprise risk-management process. This process is aligned with the internal standard ISO 31000 which provides guidance on risk-management methodologies. This includes the review of risk mitigations and controls.

Regular reviews of climate risks are conducted by the Executive Risk Management Committee and the Board Sustainability Committee. These risks are considered by the Audit and Risk Committee as part of its consideration of Enterprise risks. Our parent company, CLP Holdings Limited, integrates EnergyAustralia’s most material risks into its own risk scenarios and reporting.

EnergyAustralia’s purpose is to “lead and accelerate the clean energy transformation for all” recognising the role it plays in the transition of Australia’s energy system to Net Zero. This purpose is central to EnergyAustralia’s strategic management framework which is overseen by the Board. The strategic management framework ensures that the Board and management routinely consider the external context, risks and opportunities which shape and drive the strategic and business plans for EnergyAustralia.



DECARBONISATION PLAN

9. Operational alignment to support the Climate Transition Action Plan (continued)

9.2 Remuneration and incentives

EnergyAustralia is committed to aligning executive remuneration with positive climate, community and customer outcomes.

Current executive remuneration includes two incentive elements: a short-term and a long-term incentive. The short-term incentive is subject to the achievement of both individual objectives and the annual company Balanced Scorecard, both defined each year. Under the Balanced Scorecard, an element relates to the delivery of the development pipeline that is central to the decarbonisation of EnergyAustralia's portfolio, including the installation of batteries at customers' premises. The scorecard measures and targets are reviewed annually and subject to change based on company strategy.

The current long-term incentive spans three years and one element is reserved for strategic execution, which captures the delivery of major projects and installation of Consumer Energy Resources such as household solar and battery systems.

Executive remuneration at EnergyAustralia is currently being reviewed, including to assess whether the structure could better align with the actions required to achieve the commitments of the Climate Transition Action Plan.

9.3 External advocacy

The speed and success of Australia's clean energy transition, in parallel with the realisation of EnergyAustralia's decarbonisation ambitions, depend on the collaboration and alignment of governments and energy market participants, and the support of industries, communities, landholders and other critical stakeholders. Without supportive policy and regulatory settings to bring forward related investments and infrastructure, and to adjust the market to reward the assets and services that will be needed for the energy system of the future, Australia's decarbonisation ambitions will fall short.

In support of the clean energy transition, and consistent with government policy, EnergyAustralia backs responsible investments and policy settings that:

- expedite the transition to a Net Zero emissions energy system
- promote the responsible development of electricity transmission, balancing costs to energy customers, landholder considerations and other relevant factors
- promote increased short and long-duration renewables firming and electricity storage assets
- make it easier for households to progressively electrify their gas usage, with settings that ensure that the benefits of electrification are available to lower-income energy users
- support the safe and cost-effective deployment of Consumer Energy Resources in homes and businesses
- encourage businesses that can electrify their operations to do so
- maintain reliable and secure electricity supply while the clean energy transition is underway.

Collectively, these actions will help to decarbonise Australia's energy usage.



The Australian Financial Review ESG summit 2023
Photographer: Peter Rae

9. Operational alignment to support the Climate Transition Action Plan (continued)

The policy landscape affecting reliability and investment incentives in the NEM is undergoing extensive change, with an evolving mix of jurisdictional investment schemes alongside several legacy mechanisms like the retailer reliability obligation and interim reliability measure.

Key reforms that are relevant to EnergyAustralia's business that have been established or are in the process of development include:

- the NSW Electricity Infrastructure Roadmap, including legislated targets for dispatchable long-duration electricity storage and triggers for supplementary firming technology. EnergyAustralia was a firm advocate for this reform
- QLD Energy and Jobs Plan, which also provides for explicit investment in long-duration storage and triggers for the changing role of existing fossil-fuel generation to ensure reliability is maintained. Consultation on implementation of the plan is currently underway
- Victorian Government targets for renewable electricity storage capacity (2.6 GW committed or operational and 6.3 GW by 2035 respectively, alongside targets for renewable energy (65% committed or operational and 95% by 2035)) and offshore wind generation (2 GW committed or operational, 4 GW by 2035 and 9 GW by 2040)
- the Federal Government's Capacity Investment Scheme, which is expected to be targeted at renewable and electricity storage technologies and is currently subject to consultation.

The focus of our advocacy is intended to ensure that investment targets and government incentives are grounded in a robust, NEM-wide assessment of reliability risk and system security and are mindful of price consequences to customers. One of our key messages is that ensuring continuity of supply during the transition requires new investment at sufficient scale and capability to take place before the exit of aging and high-emissions thermal plant. Safeguarding the orderly entry and exit of these plants ultimately enables a faster transition while minimising price volatility and cost impacts for customers.

We work to advocate for these positions in a transparent and effective manner by:

- contributing sector insights to support governments to deliver progressive and actionable climate-related public policy
- setting out how EnergyAustralia advocacy has impacted or will impact the Climate Transition Action Plan objectives as part of regular future updates.

Further, EnergyAustralia does not donate funds to political parties, in accordance with our Political Donations Policy.

9.4 Memberships

EnergyAustralia supports and actively participates in a range of industry associations to keep abreast of different stakeholders' views, contribute to policy debate, develop an understanding of emerging policies, and provide a conduit for industry expertise that can help ensure that resulting legislation and regulations are practicable.

EnergyAustralia seeks to ensure that the industry associations of which it is a member, uphold advocacy positions that are not less ambitious than the achievement of Net Zero by 2050. EnergyAustralia endeavours to influence the positions of the associations of which it is a member where those positions risk falling behind this level of ambition.

Although EnergyAustralia's work through industry associations is primarily focused on climate change and energy policy aligned to our purpose to "lead and accelerate the clean energy transformation for all", some memberships serve other corporate requirements. EnergyAustralia's Yallourn mine team has asset-level membership of the Minerals Council of Australia in order to participate in the strong and effective network advocating for mine safety, and to access expertise in relation to mine operation and rehabilitation in advance of the Yallourn power station retirement and commencement of rehabilitation. This membership will cease upon the closure of the Yallourn power station in mid 2028.

Current EnergyAustralia memberships and affiliations include:

- Australian Energy Council
- Australian Industry Group
- Business Council of Australia
- Carbon Market Institute
- Champions of Change Energy
- Clean Energy Council
- Climate Leaders' Coalition
- Committee for Gippsland
- Energy Users Association of Australia
- Minerals Council of Australia

The focus of our advocacy is intended to ensure that investment targets and government incentives are grounded in a robust, NEM-wide assessment of reliability risk and system security and are mindful of price consequences to customers.

10. Assumptions, risks, limitations and reviews

10.1 Assumptions

EnergyAustralia's contribution to a Net Zero energy transition that manages reliability, moderates costs, and meets community expectations for fairness, must be in concert with significant collaboration and coordination between all levels of government, industry, communities and customers.

EnergyAustralia is keenly aware of the challenges in this complex environment and, while putting every effort towards delivery of its goals, it recognises some key assumptions on which it has based its plans in this Climate Transition Action Plan and, in [Section 10.2](#), significant risks and uncertainties that may impact EnergyAustralia's ability to meet the commitments in this Climate Transition Action Plan:

Forecast asset retirement and new project build schedules:

EnergyAustralia's ability to decarbonise is dependent on the delivery of new capacity, and the continued supply from other energy suppliers until their scheduled retirements. For example, sufficient dispatchable capacity in the NEM will mean Mount Piper is able to operate in a reserve role and will not need to operate beyond expectations or supply a greater volume of electricity than forecast for the purposes of reliability and grid security.

Conductive policy and market settings: The speed and scale of long-term electricity storage asset deployment and investment in renewable energy will depend significantly on the extent to which developers and operators are able to be confident in assumptions of sufficient revenue to be generated from investments. If policy and market settings are supportive, the construction of renewables firming will not lag behind what is needed to firm increasing volumes of renewable energy and facilitate coal closures. Particularly for long-duration forms of electricity storage, supportive market rules are needed to make the economics of these projects more feasible.

Customer support for the energy transition: Sufficient C&I and mass-market customer appetite for contracts bundled with renewable Power Purchase Agreements or GreenPower are important to EnergyAustralia's intention to procure long-term renewable energy supply at the volumes targeted.

Access to capital and credit rating: Access to competitive debt, equity, insurance and tradable instruments such as carbon offsets is important to timely investment and EnergyAustralia's resulting transition timeframes. For example, EnergyAustralia's credit rating is important for competitive access to capital and for its capacity to enter into Power Purchase Agreements for offtake from renewable projects.

Forecast rate of technological development and associated costs: For power system emissions to decline as fast as forecast it requires the effectiveness and reduction in cost of new technologies to eventuate as forecast, for example long-duration electricity storage. The capacity for generation assets such as EnergyAustralia's Tallawarra power station to use significant quantities of renewable hydrogen¹³ requires hydrogen technology and production to be commercially viable within anticipated timeframes.

System reliability and security: The ability for existing dispatchable plant to operate up to its scheduled closure date or change patterns of operation to address system reliability and system security concerns is dependent upon sufficient grid capacity and technical grid services. Without these, there may be variations in power station emissions between years and higher overall emissions and higher emissions intensity for longer.

Mount Piper commercial operation and coal supply:

EnergyAustralia's ability to continue to operate Mount Piper, including in a reserve role to contribute to energy system reliability and security, is based on the assumption that it is commercially viable and a sufficient, cost-effective supply of coal can be procured.

10.2 Risks

Examples of some risks that EnergyAustralia considers material to meeting its commitments include:

Failure to obtain appropriate social licence and access to land to host infrastructure:

Existing capacity (such as Mount Piper) may need to continue operating for longer than forecast if sufficient social licence, access to land (including for transmission lines) and stakeholder endorsement are not obtained to build or connect new sources of renewable electricity and capacity asset supply.

Delayed delivery of infrastructure to support the clean energy transition:

The clean energy transition will require significant upgrades to and expansion of electricity transmission and distribution infrastructure. Delays to infrastructure delivery may result in the entry of new generation projects to the market being delayed, distributed Consumer Energy Resources being sub-optimal, and existing generation being required to remain in operation to ensure grid stability.

Uncertainty in emissions intensity: An increase in the speed of or, alternatively, continuing delays to the energy transition will result in variations to our forecast Scope 1 emissions reduction levels.

Supply chain disruption and critical skills shortages:

International competition for skills, materials and resources, and challenges in procuring these transparently and ethically, may result in increased costs or delays to new projects contributing to slower-than-expected decarbonisation.

Changes in government policy, market settings, environmental regulation or climate methodology:

Conflicting or misaligned legislative or regulatory settings may impede the speed and orderliness of the energy transition, undermining confidence in or incentives for new project investment. Changes to financial carbon accounting rules, measurement methodologies for emissions or government policy changes may alter valuations, and may require the resetting of emissions reduction benchmarks and targets, and the approach to decarbonisation activities. The decision as to when Mount Piper may play a reserve role is reliant on supportive policy settings.

10. Assumptions, risks, limitations and reviews (continued)

On current settings, operating in a reserve role would result in heavily constrained revenue relative to standard operation and may not be commercially viable. Other wholesale changes to government policy, such as the reintroduction of a carbon price, or incentives to extend asset life, would impact the approach outlined in this Climate Transition Action Plan.

Gas asset reliance: The role to be performed by EnergyAustralia's gas-fired power stations in its portfolio will be impacted by the availability of gas, the ability to procure gas supply in a timely manner and the ability for those assets to run at significant levels of output over longer periods.

Changes in energy demand, network tariffs and customer preferences: Material changes in electricity demand as a result of the uptake of new energy products, coupled with shifts in how and when customers use energy (as a result, for example, of pricing structures that reward electricity use during periods of abundant renewable electricity supply), will change the nature of the investment required in generation assets. For example, EnergyAustralia's gas-fired power stations might be required to run at a higher output more often to meet demand peaks as a result of, for example, increased Electric Vehicle charging.

Geopolitical risks: Geopolitical tensions and events may disrupt global supply chains, impact access to capital or drive international and domestic price divergence that result in more emissive capacity in the NEM continuing to operate. This would result in slower decarbonisation.

Climate change and extreme weather impacts: Physical climate change impacts on assets within the EnergyAustralia portfolio, the NEM infrastructure, storage facilities and fuel supplies, and may result in changes to forecast operation, potentially resulting in increased emissions.

EnergyAustralia will continue to monitor these risks and uncertainties to gauge their impact on its Climate Transition Action Plan commitments and to respond proactively to maintain the Net Zero trajectory.

10.3 Limitations on forward-looking statements

This Climate Transition Action Plan has not been prepared as financial or investment advice or to provide any guidance in relation to the future performance of EnergyAustralia or another entity. This Climate Transition Action Plan contains climate-related and other forward-looking statements which are based on the expectations, best estimates and assumptions of EnergyAustralia's management as at the date of preparation of this Climate Transition Action Plan. However, these may be affected by a range of factors which could cause actual results to differ materially. These include, but are not limited to, actual energy demand, market, regulatory and policy changes, technological development and general economic conditions.

Forward-looking statements are not guarantees, predictions or forecasts of future performance or outcomes, and are subject to both known and unknown risks, other uncertainties and may involve elements of subjective judgement and assumptions.

These statements may be affected by limitations in data or methodologies, inaccurate assumptions or known and unknown risks, many of which may lie beyond EnergyAustralia's control. As such, you are cautioned not to place undue reliance on these statements, particularly considering significant uncertainty in relation to economic, social, or geopolitical conditions, policy and regulation, climate-related risk analysis and reporting requirements, which may cause actual results to differ materially from those expressed or implied by the statements. These statements are considered to be made on, and are applicable as at, the date of publication and no representation is made as to their accuracy, completeness or reliability after this date. Other than as required by applicable regulations or law, EnergyAustralia does not undertake any obligation to publicly update, release or review any revisions whether as a result of new information or future events, after this date.

Past performance cannot be relied on as a guide to future performance. No representation or warranty, express or implied, is given as to the accuracy, completeness or correctness, likelihood of achievement or reasonableness of any forward-looking information contained in this Climate Transition Action Plan.

10.4 Climate Transition Action Plan review cycle and updates

EnergyAustralia's intention is to report progress against the Climate Transition Action Plan annually. A full Climate Transition Action Plan review and release cycle will be completed every three years, with any material changes resulting in a revised Climate Transition Action Plan being released within the three-year period where necessary, and in the case of the next iteration, within 18 months. EnergyAustralia does, however, recognise that energy, climate and sustainability policy development and reporting are rapidly evolving. As international best-practice Climate Transition Action Plan reporting evolves, EnergyAustralia commits to evolving with it. This may result in more regular and detailed reporting and additional iterations of the Climate Transition Action Plan.

One example of our commitment to the evolving reporting sphere is EnergyAustralia's support for both the Federal Treasury and the International Sustainability Standards Board's development of standardised disclosure frameworks for climate-related financial reporting. These new frameworks will strengthen global decarbonisation objectives and underpin a rapid and responsible energy market transition. It is understood that reporting against mandated standard will commence for an initial tranche of companies in Australia that meet specific criteria (which will include EnergyAustralia) in the 2024–25 financial year. Any implications for Climate Transition Action Plan targets and objectives arising from these reporting requirements will be communicated in future iterations of the Climate Transition Action Plan.

11. Glossary

11.1 Defined terms

Absolute emissions: Absolute emissions refers to the total amount of greenhouse gases emitted into the atmosphere over a specific period, typically a year, reported as a total mass of carbon dioxide equivalence (CO₂-e). It is calculated against defined reporting scopes and includes other greenhouse gases such as methane, which is converted to an equivalent amount of CO₂ based on their potency as a greenhouse gas.

AEMO or Australian Energy Market Operator: Refers to the organisation that manages the electricity and gas systems and markets across Australia, helping to ensure that Australians have access to affordable, secure and reliable energy.

AEMO ISP: The AEMO ISP (Integrated System Plan) is a whole-of-system plan that provides an integrated roadmap for the efficient development of the NEM over the next 20 years and beyond.

Base load: Generating units that typically run at all times throughout the year except during maintenance outages. Coal-fired generating units are a typical example of base load generating units.

Behind the meter assets: Behind the meter assets are renewable energy units or systems that are commonly located at houses or businesses to provide them with power.

Carbon offset: A carbon offset is a removal or avoidance of emissions, which adheres to an internationally recognised standard and is sourced from projects such as reforestation or renewable energy, in order to compensate for emissions made elsewhere.

Clean Energy Council: Clean Energy Council is a not-for-profit membership-based organisation representing and working with Australia's leading renewable energy and storage businesses to further develop clean energy in Australia.

Climate Active: Climate Active is the Federal Government-accredited carbon neutral certification scheme in Australia.

CLP Holdings Limited or CLP: Refers to CLP Holdings Limited, which is a power company listed on the Stock Exchange of Hong Kong and is the parent company of EnergyAustralia.

Commercial and Industrial or C&I customer: Refers to a customer which consumes greater amounts of energy than a small customer (being either a residential (household) customer or a business customer which consumes energy at or below a level determined under the energy laws applicable in Australian jurisdictions).

Consumer Energy Resources: Consumer energy resources are electricity production or storage assets that are located behind the meter, within the property of energy users. They include rooftop solar panels, batteries and Electric Vehicles connection points.

Electric Vehicle: Electric Vehicles are battery-powered vehicles, such as motor bikes, cars, buses and trucks.

Emissions intensity: Emission intensity is the tonnes of CO₂-equivalent Scope 1 emissions per MWh of electricity sent out from defined assets.

Expected Unserved Energy: A measure of the expected amount of electricity not delivered to customers, as a result of inadequate capacity to meet the anticipated demand.

Greenhouse Gas Protocol: Greenhouse Gas Protocol establishes comprehensive global standardised frameworks to measure and manage greenhouse gas (GHG) emissions from private and public sector operations, value chains and mitigation actions.

ISP step change scenario: The AEMO Integrated System Plan proposes a 30-year roadmap for electricity investment in the NEM based on scenario analysis. The step change scenario is considered to be the most likely scenario to eventuate by stakeholders.

Just transition: Just transition is a principle, a process and a practice. The principle of just transition is that a healthy economy and a clean environment can and should co-exist. The process for achieving this vision should be a fair one that should not cost workers or community residents their health, environment, jobs, or economic assets.

NEM or National Electricity Market: The National Electricity Market is a wholesale market through which generators and retailers trade electricity across Australia, with the exception of Western Australia and the Northern Territory.

Net Zero: Net Zero is defined in the ISO Net Zero Guidelines (IWA 42:2022) as "a condition in which human-caused residual greenhouse gas (GHG) emissions are balanced by human-led removals over a specified period and within specified boundaries". For EnergyAustralia this means achieving Net Zero across our value chain. This will require a combination of emissions reductions, technological developments and offsets, which are required to address residual emissions that remain unfeasible to be eliminated permanently.

Paris Agreement: References to the Paris Agreement mean the agreement of parties to terms of Article 2, Part 1(a) which reads, "Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change".

Power Purchase Agreement: This is an arrangement in which a provider pays for and owns the renewable energy system but sells the energy it produces to businesses at a lower rate than energy from the grid. This allows businesses to obtain renewable energy at rates cheaper than retail without the need to purchase a system themselves.

Renewables firming: Renewables firming refers to energy that is not baseload and can be switched on or off depending on demand. It typically refers to gas-fired power stations and long-term duration storage assets and includes flexible capacity.

12. Endnotes

Scope 1 emissions: These are greenhouse gas emissions released to the atmosphere as a direct result of an activity, or series of activities, at a facility level. Scope 1 emissions are sometimes referred to as direct emissions.

Scope 2 emissions: These are greenhouse gas emissions released to the atmosphere from the indirect consumption of an energy commodity.

Scope 3 emissions: These are indirect upstream and downstream greenhouse gas emissions, other than Scope 2 emissions, that are generated in the wider economy. They occur as a consequence of the activities of an organisation, but from sources not owned or controlled by that business.

Storage Agreements: Storage Agreements are agreements that are different to renewable offtake agreements (or Power Purchase Agreements), and under which EnergyAustralia becomes the registered market participant with AEMO and is responsible for the market operations of the asset.

11.2 Electricity measures

Watt (W) Standard measure of electrical power when one ampere of current flows under one volt of pressure.

Kilowatt (kW) 1 kW = 1,000 watts.

Kilowatt hour (kWh) Standard unit of electrical energy representing consumption of one kilowatt per hour.

Megawatt (MW) 1 MW = 1,000 kW.

Megawatt hour (MWh) 1 MWh = 1,000 kW hours.

Gigawatt (GW) 1 GW = 1,000 MW.

11.3 Version control

This version produced on 18 August 2023.

- 1 AEMO, [2022 Integrated System Plan](#), p. 10.
- 2 CSIRO, [Renewable Energy Storage Roadmap](#), March 2023.
- 3 CSIRO, [Renewable Energy Storage Roadmap](#), p. 116.
- 4 CSIRO, [Renewable Energy Storage Roadmap](#), p. 116.
- 5 Renewable hydrogen is hydrogen produced through electrolysis powered solely by electricity supplied from an "eligible renewable energy source", or with equivalent "large-scale generation certificates" as defined in the [Renewable Energy \(Electricity\) Act 2000](#) (Cth) or, in the future, Renewable Electricity Guarantee of Origin certificates.
- 6 Renewable hydrogen is hydrogen produced as defined in note 5.
- 7 Renewable hydrogen is hydrogen produced as defined in note 5.
- 8 AEMO, [2022 Integrated System Plan](#), p. 11.
- 9 Grattan Institute, [Getting Off Gas](#), June 2023.
- 10 CSIRO, [National Hydrogen Roadmap](#), August 2018, p. 46.
- 11 Daniel Krosch, [Hydrogen Impacts on Downstream Installations and Appliances](#), GPA Engineering, November 2019, p. i.
- 12 James Burgess, "[UK's gas grid ready for 20% hydrogen blend from 2023: network companies](#)", *S&P Global Commodity Insights*, 14 January 2022.
- 13 Renewable hydrogen is hydrogen produced as defined in note 5.



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