



Deploy

Ambitious cleantech rollout to cut emissions and build a prosperous Australian economy

Recognition of traditional custodians

We recognise that Aboriginal people's sovereignty over their land was never ceded and the impact of this ongoing dispossession continues to this day. Beyond Zero Emissions stands in solidarity with First Nations people in calling for the establishment of a First Nations Voice in the Constitution, as described in the Uluru Statement from the Heart. We further support calls for the establishment of a Makarrata Commission on agreement-making and truth-telling between Aboriginal and Torres Strait Islander peoples and governments.

Beyond Zero Emissions maintains an office on the traditional lands of the Wurundjeri-willam people of the Kulin Nation, and in Newcastle on the lands of the Awabakal, Worimi and Wonnarua peoples. We pay our respects to all First Nations Elders past, present and those emerging.



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Deploy: Ambitious cleantech rollout to cut emissions and build a prosperous Australian economy should be attributed to Beyond Zero Emissions.



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1. Executive summary

A national cleantech rollout can cut Australia's emissions 81% by 2030

Australia has the opportunity to make ambitious cuts in greenhouse gas emissions and build a prosperous modern economy using the clean technologies that exist today. The Australian Government's legislated target of 43% emissions reduction by 2030 is just the start of what is possible.

This report demonstrates that an **81% emissions reduction is achievable by 2030** with an ambitious rollout of clean technology over the next five years, supported by targeted carbon drawdown initiatives. This can only be achieved with immediate and large-scale actions, prioritising short-term ambitious targets for already-available technologies.

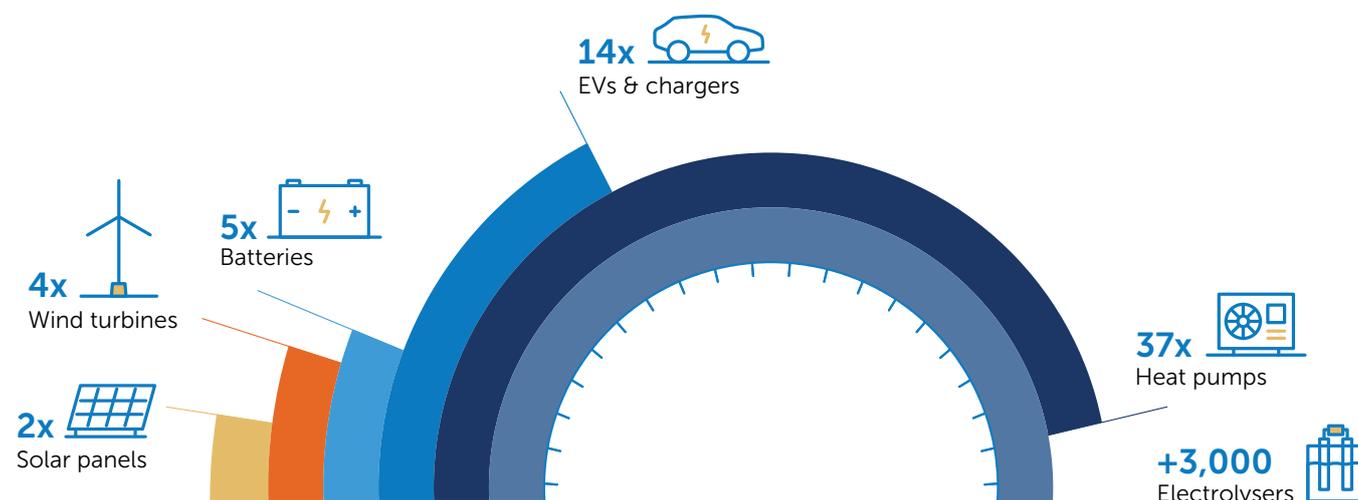
In this report Beyond Zero Emissions outlines a five-year deployment plan, identifying the most impactful technologies, the number of units of each technology we need to deploy, and what it means for rollout rates over the next five years.

The deployment plan will create jobs: we found a technology rollout at scale, plus carbon drawdown for targeted activities, can put Australia on the path towards the IPCC scenario SSP1-1.9 (for 1.5 degrees of average global warming)¹ and create 195,000 jobs that are not susceptible to the boom and bust of the fossil fuel markets.

Six technologies – all available today – will do the heavy lifting: solar panels, wind turbines, batteries, electric vehicles, heat pumps and electrolyzers.

Figure 1: Increase in rollout rates for six key technologies to achieve the five-year plan

	Deployed in 2021	Annual deployment plan	5-year deployment plan total	5-year technology deployment plan
Solar panels (utility scale)	1.9M	3.5M	17.7M	66.7M Solar panels, inc. utility scale and domestic
Wind turbines (utility scale)	300	1,200	6,000	6,000 Wind turbines
Batteries	270,000	1.3M	6.4M	67 GWh inc. utility scale and domestic batteries
EVs (passenger vehicles)	21,000	281,000	1.4M	3.8M Passenger electric vehicles & chargers
Hot water heat pumps	26,000	950,000	4.8M	9M Hot water and split-system heat pumps
Electrolysers	1	600	3,000	3,000 Electrolysers for green H2 for industry



The Five-Year Deploy Plan

This report shows where commercially available technologies can be rolled out to reduce emissions and create jobs. We consider deployment of all-electric clean technology across three sectors of the economy: buildings, transport and industry. A mass build-out of new renewable electricity generation and storage is the underpinning enabler for powering zero-emissions homes, vehicles and industries. Carbon drawdown in the land use sector is allocated only to the hardest-to-abate activities that are central to our economy.

Impact is considered in terms of the emissions reductions achievable and the number of jobs that can be created.

To succeed, our five-year Deploy plan requires investment and coordination, skilled people and reliable supply chains. Each sector needs an ambitious, individualised roadmap to achieve its emission reduction contributions rapidly and deeply, removing inertia and allowing momentum to build.

This plan sets the ambition, establishes the job potential and demonstrates the opportunity of acting without delay for industry and manufacturing, business and households.



Electric bus. Image courtesy of Custom Denning.

Renewable generation and storage are the foundation

Our five-year Deploy plan is ambitious and achievable. One-hundred percent renewable generation and storage is the foundation for success.

By deploying 64 GW of renewable capacity and 13 GW (67 GWh) of energy storage capacity Australia can reach 84% renewable energy generation within five years. This equates to about 6,000 wind turbines and 66 million solar panels. With this

foundation, a target of 100% renewable energy generation by 2030 is feasible.

This ambitious undertaking means installing more generation capacity and far more storage than the total of all types of generation capacity and storage in Australia today. It is doable: in 2021 alone Australia added 6.2 GW of renewable generation.² Doubling the 2021 rollout rate of renewable generation will realise the ambitions identified in this plan.

Six technologies for households, industry and transport

In the next five years, we need to install clean technology in our homes, vehicles and industries at a rate of about two units or appliances per household. We cannot afford to wait for new research and inventions, and we don't need to. We already know how to make the key technologies that are needed for a zero-emissions economy – we just need to make more of them and put them to work. Over five years, this looks like:

- 10.6 million units of clean technology in three million residential buildings, such as hot water and air conditioning heat pumps
- 2.9 million units of building efficiency technologies (including thermal upgrades and induction cooktops)
- 7,000 units of technology in industrial settings, largely industrial-scale heat pumps and electrolysers
- 3.8 million units for transport (made up of electric vehicles and chargers).

Australia has set a renewable energy record with more than a quarter of households now generating power on their roofs.³ Australia's roll-out of residential air-conditioning heat pumps is already faster than the pace needed in this plan, and the rollout of domestic solar panels needs to increase by less than double. Installations of heat pump water heaters, however, need to ramp up significantly.

For certain clean technologies accelerated rollout is from a standing start. The uptake of electric passenger cars, for example, will need to be almost 14 times today's rate. Fleet sales, a third of Australia's new car market, can do the heavy lifting here. This level of ambition is not unprecedented. Sweden increased its new car sales from 10% EVs in December 2019 to 60% by December 2021.⁴

Benefits can be multiplied for regional Australia

This ambitious technology rollout is a once-in-a-generation opportunity to upgrade Australia's building stock to increase comfort and reduce energy bills, electrify our vehicles for quieter, cleaner roads, and build modern, competitive industrial capability.

Mass technology deployment, in combination with strong local procurement mandates, can revitalise our manufacturing industries with onshore assembly and manufacture of clean technology. In our regional industrial heartlands, where so much of the necessary innovation and manufacturing is already underway, we can leverage traditional manufacturing strengths and create economic opportunities for areas that will be most impacted by a drop in demand for fossil fuels.

Wind turbines, lithium-ion batteries, thermal storage and electric vehicles are among the renewable technologies already manufactured onshore today, and highlighted in this report. In the Hunter Valley, NSW, the region could soon be manufacturing a wide range of green technologies, including batteries and low carbon building materials such as green steel, in clusters of manufacturing plants

powered by 100% renewable energy.⁵ In Central Queensland, this model of Renewable Energy Industrial Precincts⁶ could be producing wind turbines, high purity alumina, renewable hydrogen and ammonia for domestic and export customers.⁷

The precinct approach to manufacturing capitalises on existing skills and trades in mining regions, with more than half of the new jobs needed being equivalent to current ones, including technicians, trades, machinery operators, drivers and labourers.⁸

Establishing Renewable Energy Industrial Precincts in just two of 14 identified first-mover regions – Central Queensland⁹ and the Hunter¹⁰ – could attract \$36 billion in investment, support 45,000 new ongoing jobs by 2032 and earn \$13 billion in annual revenue. As the world shifts to a zero emissions we can capitalise on Australia's abundance of competitive renewable resources, rich mineral wealth, and skilled industrial base and workforce. We can use these ingredients to leverage our manufacturing capability and build new export industries worth up to \$333 billion – more than three times our fossil fuel revenue.¹¹



Coordination and community support are essential

The five-year deployment plan will require careful coordination and integration. New renewable energy generation, storage and transmission to replace the fossil fuel-driven electricity grid must be at a pace that supports the mass rollout of clean electric technologies. The goal is to become zero-emissions without spiking emissions from our current fossil-fuel energy generators. To achieve this, we must drive uptake of energy efficiency measures in buildings and industries, where more than half of current energy use can be saved.^{12 13}

To be a just transition with opportunities realised for all, local communities must be at the forefront.

First Nations' participation regarding environmental, social and economic impacts needs to be integral to planning, execution and management. Pilbara Solar is an example of a 50%-Aboriginal-owned renewable development company with a mission to develop utility-scale, renewable energy solutions.¹⁴ Its 10 MW Junja Solar Farm project is under development and has equity ownership with the Jinparinya Aboriginal Corporation.¹⁵ The solar farm is proposed to be built on Aboriginal land with the agreement of the Traditional Owners, who will receive significant benefits from the project.

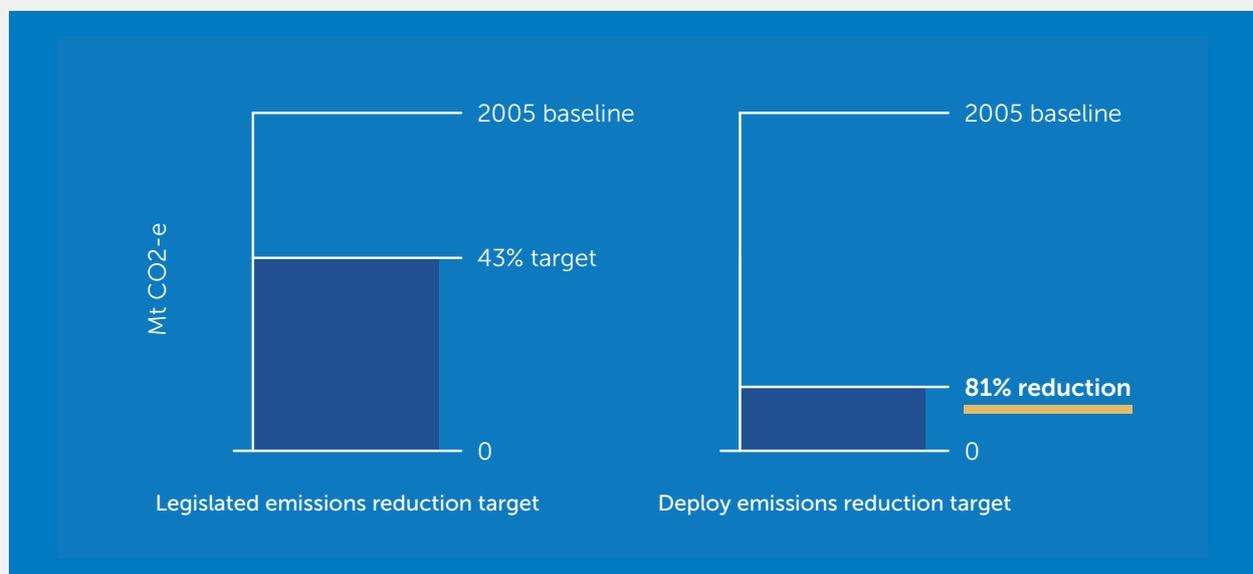
More ambitious than Australia's 43% emissions reduction target

For this report we use 2019 as the emission baseline to capture the actions Australia needs to take right now with confidence.

When we compare our total reduction figures to 2005 emission levels (used by national and state governments) we reach a 70% emissions

cut by 2030. This is 81% when carbon drawdown is taken into account. The potential for emissions reduction is far greater than the Australian Government's legislated target of a 43% reduction in emissions by 2030 compared to 2005 levels.

Figure 2: Emission reductions by 2030 with the Deploy Five-Year Plan compared to current legislated target



The Intergovernmental Panel on Climate Change (IPCC) says it is essential that carbon emissions are brought to net zero as rapidly as possible to stay in line with 1.5 degrees of planetary warming, and avoid "an environmental disaster,"¹⁶ but we need to go further, beyond net zero, to bring atmospheric concentrations of carbon dioxide to safer levels. That must be our long-term aim.

ReThinkX calculates that 90% reduction in global emissions is possible by 2035 using just eight existing technologies.¹⁷ The International Energy Agency supports this position in its 2021 report: "All the technologies needed to

achieve the necessary deep cuts in global emissions by 2030 already exist."¹⁸

Climateworks' Decarbonising Futures report shows that by reducing our emissions by 74% by 2030 (from 2005 levels), we can reach net zero by 2035.¹⁹ Our Deploy plan will cut 81% of emissions by 2030 (from 2005 levels) and, if achieved, could reach net zero before 2035. In 2030, some of the technologies that are emerging now will be commonplace and deployable. It will be cheaper, more efficient, faster and, with an upskilled workforce, easier to roll out. The opportunity to drive down to zero emissions will be very real indeed.

For more information about moving to a zero-emissions economy, please contact:

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