

RESEARCH BRIEF

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Strong climate and energy policies can create 105,000 new jobs in Victoria by 2030

Research commissioned by the Australian Conservation Foundation and the Australian Council of Trade Unions indicates that strong policies on climate change and energy would generate an additional 105,500 jobs by 2030 and 251,400 jobs by 2040 in Victoria – over and above those that would be created under current national policy settings.

Many of these jobs would be in regional areas and would help boost communities while preserving our rich natural heritage. Strong climate action would stop pollution growing and help us leave a legacy of natural beauty, security and prosperity for future generations.

The Victorian government is taking the first steps towards building that future. It would be significantly furthered by much stronger climate action from the Federal Government.

Table 1: Examples of existing projects that are consistent with strong action on climate change.

Project type	Description	Area	Stage	Total investment
Renewable energy	Dundonnell wind farm (300MW)	Dundonnell	Proponents advise full commercial operation in Dec 2018	\$650 million 300 jobs
	Ararat wind farm (240MW)	Ararat	Full commercial operation commencing in May 2017	\$450 million 165 jobs
	Mt Gellibrand wind farm (66MW)	Mt Gellibrand	Proponents advise full commercial operation in Dec 2018	\$275 million 100 jobs
Energy Efficiency	Energy efficiency improvements to state buildings and infrastructure.	Whole of Victoria		\$33 million
Public transport	Melbourne Metro Rail Project - lines will have dedicated tunnels through CBD + three new stations	CBD and inner suburbs	Initial stages	\$2.9 billion over forward estimates

				(total \$10.9 billion)
	Regional Network Development Plan - Deliver commuter-style service for growth areas	Geelong, Bendigo, Ballarat, Seymour and Traralgon	Initial stages	\$1.3 billion in 2016/17
	Ballarat line upgrade - Duplicate the Ballarat line to Melton to increase the frequency of services for the Ballarat region and Melbourne's outer west.	Ballarat	Initial stages	\$518 million in 2016-17
	Mernda rail upgrade - Extend the South Morang train line to Mernda to cater for population growth in Melbourne's north	Mernda	Funded in 2016-16 Budget	\$600 million
	Bayside Rail Project - Frankston line upgrade	Frankston line	Due for completion December 2016	\$115 million

Introduction

Global warming has real potential to damage the communities and the natural heritage of Victoria. This is exacerbated by fossil fuel and coal-fired generation companies continuing to extract fuels that should be left in the ground. Victoria's reliance on dirty brown coal for electricity is a big part of this, with 84 per cent of the state's electricity generation coming from coal.¹ Many of Victoria's coal-burning power facilities are past their original design life and should be replaced with clean, renewable energy. Yet, sudden closure without transition planning will cause disruption in regions – especially in the Latrobe Valley. The announcement of the upcoming closure of the Hazelwood Power Station has brought this issue to the attention of the wider Victorian public.

The good news is strong national action on global warming, through supporting renewable energy, energy efficiency and public transport can help curb global warming and generate more than 105,000 more jobs in Victoria by 2030 than the federal government's current climate policy settings. That figure would climb to more than 250,000 by 2040.

This report shows how the Victorian Government, by setting a target of 40 per cent renewable energy generation by 2025, and committing to zero net emissions by 2050, has taken an effective step in securing sustainable jobs and the future prosperity of communities throughout Victoria. While stronger action by the federal government might have made

¹Victorian Government, [Victoria's Renewable Energy Roadmap](#), July 2015, p.3

Victoria's renewable energy target (VRET) unnecessary, the current national RET was reduced to 23.5 per cent by 2020 and does not provide sufficient investment certainty or ambition post-2020.

Instead, the Federal Government seems determined to attack state governments like Victoria for setting targets that will drive jobs and growth and are more consistent with Australia's Paris climate change commitments.

The global challenge

Under the Paris Agreement 195 nations agreed to work towards limiting the world's temperature rise to well below 2 degrees and to continue to pursue efforts to limit the temperature rise to 1.5 degrees.²

In the last few years there has been a massive shift towards investment in new renewable energy and energy efficiency. More than 70 per cent of investment in new power plants – more than \$290 billion – went towards renewable energy projects in 2015. The price of renewables continues to plummet (for example, since 2011 the price of installed solar has dived 80 per cent) and 2015 was the first year investment in new renewables was more than enough to cover rising global electricity demand.³

Unfortunately, Australia isn't pulling its weight in the international effort to address global warming. As part of the Paris Agreement, the Australian federal government committed to reduce Australia's emissions by 26–28 per cent on 2005 levels by 2030. This is much lower than the Climate Change Authority's recommendation of 40–60 per cent on 2000 levels by 2030.⁴ Even this figure only offers a 67 per cent chance of keeping global warming below 2°C⁵, a stronger target of 65–85 per cent would provide greater certainty.

Since coming to office in September 2013 the Coalition has made no progress in reducing Australia's overall levels of climate pollution. In fact, there is an upward trend. In its first June quarter in Government (June 2014) emissions were at 131.5 million metric tonnes of carbon dioxide equivalent (Mt CO₂-e). In the June 2016 quarter, they were at 134.4 (Mt CO₂-e), an increase of 2.2 per cent.⁶ This suggests recent federal government policy to reduce climate pollution has had little impact.

A recent report by Reputex shows that existing policies, instead of achieving a 26–28 per cent decrease in carbon emissions, would in fact make Australia's climate pollution increase between now and 2030.⁷ Australia's failure to take effective action has frustrated the

² UNFCCC, [Historic Paris Agreement on Climate Change](#), December 2015

³ ReNewEconomy, [Seven charts show new renewables outpacing rising demand for first time](#), September 2016

⁴ CCA, [Final report on Australia's future emissions reduction targets](#), July 2015, p.

⁵ CCA, [Special Review Draft Report](#), April 2015, p.20

⁶ Department of the Environment, [Quarterly Update of Australia's National Greenhouse Gas Inventory: June 2016](#), p.29, December 2016

⁷ Reputex, [Framing Australia's 2030 Energy and Climate Policy Mix](#), September 2016, p.4

international community. Prior to the recent UN climate summit in Marrakech, the Australian Government received more than 30 questions from key trading partners, asking why a downwards trend had become an upward one and how Australia plans to meet its 2030 targets.⁸

This failure to take effective action is unacceptable given the scale of the threat, one that is already becoming a reality, with 2016 officially the hottest year on record, surpassing 2015, which itself topped the previous hottest year, 2014.⁹ Global warming is making bushfires more frequent, droughts more devastating and natural wonders like the Great Barrier Reef – which sustained the largest die-off in 2016, due to recent coral bleaching¹⁰ – more vulnerable to future damage. The impact on livelihoods from loss of coral reefs has the potential to be catastrophic and global.

To add to this, Australia is falling behind in the renewable energy race. The world is set to invest US\$28 *trillion* in renewable energy and energy efficiency by 2035 – more than coal, oil and gas combined.¹¹

Australia should be a renewable energy super-power. Instead we are missing the chance to create thousands of jobs in Victoria, and many more across the nation.

The potential of strong climate action

ACF's recent jobs report [Jobs in a clean energy future](#), delivered in collaboration with the Australian Council of Trade Unions (ACTU), using research by the National Institute of Economic and Industry Research (NIEIR), showed how strong energy policies can result in a million new jobs across Australia. The research employed dynamic integrated economic modelling to show the effect on jobs of two different carbon abatement scenarios and compared these to business as usual (BAU) federal policy. The results are summarised in the table below.

Scenario	Description	Abatement Methods	Additional Victorian jobs by 2030	Additional Victorian jobs by 2040
BAU	Current federal policy without further intervention	Current	None	None
Medium	CO2 abatement budget of \$10 billion per annum	Increased renewable energy generation and battery	50,800	85,200

⁸ UNFCCC, [Session SB145 \(2016\)](#), October 2016

⁹ '[Scientists declare 2016 the hottest year on record. That makes three in a row.](#)' *Washington Post*, January 2017

¹⁰ ARC Coral Reef Studies Centre of Excellence Bleaching Mortality media release, 29 November 2016. <https://www.coralcoe.org.au/media-releases/life-and-death-after-great-barrier-reef-bleaching>

¹¹ BZE, *Renewable Energy Superpower*, October 2015, p.VI

	in real terms funded by the revenue from a modest carbon price	storage, expanded public transport, reduced traffic congestion through strategic road investments and carbon pricing		
Strong	80 per cent reduction on 2005 carbon emission levels by 2040	As above with additional investment in general energy efficiency and the development of biofuel or biodiesel.	105,000	251,400

Table 2: Additional jobs created in Victoria by stronger federal policies on climate and energy

The report shows that not only does strong climate policy de-couple greenhouse gas pollution from growth and dramatically reduce emissions, it creates new, high quality jobs, improves industry efficiency and strengthens Australia’s overall economy. Many of these jobs would be in regional areas and could provide employment opportunities needed for communities affected by the retirement of old coal-fired power stations.

Victoria renewable energy and carbon reduction objectives

Encouragingly, the Victorian Government has surged ahead of the inadequate ambitions of the Federal Government with policies that will help capitalise on the jobs potential of the strong climate action described above. The Victorian Government has promised to:

- Generate 25 per cent of the state’s electricity from renewable energy by 2020
- Generate 40 per cent of the state’s electricity from renewable energy by 2025 ¹²
- Cut the state’s climate pollution levels by 15–20 per cent on 2005 emission levels by 2020, with a goal of having net zero carbon emissions by 2050 ¹³
- Cut emissions from government operations by 30 per cent of 2015 levels by 2020 ¹⁴

These targets are a big step towards strong climate action and help build industries that could secure the future for communities throughout Victoria.

Humble beginnings

These targets are ambitious but achievable. The state government has indicated it is following a model championed by the ACT government, which has supported achievement of their 100 per cent renewable energy target at minimal costs to consumers. At present just 12.1 per cent of electricity generated in Victoria comes from renewable sources.¹⁵ The sector has also been considerably stunted by uncertainty over and the lowering of the national Renewable Energy Target (RET), which caused investment levels to fall nationally to nearly

¹² Victorian Government, [Renewable Energy Targets to Create Thousands of Jobs](#), June 2016

¹³ Victorian Government, [Climate Change and Victoria](#), 2017

¹⁴ Victorian Government, [Climate Change and Victoria](#), 2017

¹⁵ Clean Energy Council, [Clean Energy Australia Report 2015](#), June 2016, p.7

half the average annual investment in renewables 2010-13 in 2014-15, with \$5–6 billion of foregone investments in total.¹⁶

Similarly the renewable energy sector in Victoria, which has huge wind potential, especially in coastal areas and inland regions such as Ballarat and the north of the state, was highly constricted by a set of excessively restrictive laws on the placement of wind farms under the Baillieu Government.¹⁷ That move is thought to have cost the state \$887 million in lost or stalled investment, 650 direct jobs and a further 1,400 indirect jobs before it was repealed by the Andrews Government in 2015.¹⁸

This leaves a lot of work to be done but equally a lot of opportunity. The 2040 target needs enough capacity to generate approximately 18TWh of energy a year from renewable sources.¹⁹ This is nearly three times more than the current annual renewable energy generation level in Victoria, which stands at 6.7TWh²⁰ and will need 5,400MW of large scale wind and large and small scale solar to be built in less than one decade.²¹

The potential

The government expects to hold reverse auctions in 2017 with the goal of generating 1,800MW of new capacity and getting it built by 2020, a move which is expected to generate 3,000 jobs by 2020, before any costs are imposed, and then another 4,000 additional jobs by 2023-24.²² The government recently gave the green light to a 300MW wind farm in Dundonnell, which is expected to generate 300 direct and indirect jobs at the peak of construction and attract \$650 million of investment to the area.²³ This is in addition to the 240 MW Ararat wind farm (165 jobs and \$450 million)²⁴ and 66MW Mt. Gellibrand wind farm (100 jobs and \$275 million).²⁵

Project	MW	Jobs	Investment
Dundonnell	300	300	\$650,000,000
Ararat	240	165	\$450,000,000
Mt Gellibrand	66	100	\$275,000,000
Total	606	565	\$1,375,000,000

Table 1: Approved wind farm projects in Victoria

¹⁶ Climate Council, [Game On: The Australian Renewable Energy Race Heats Up](#), May 2016, p.6

¹⁷ Yes2Renewables, [Maps show where you can't build a wind farm](#), April 2011

¹⁸ ReNewEconomy, [Vic Labor ditches 2km wind farm restrictions, reforms planning laws](#), March 2015

¹⁹ The Conversation, [Victoria's renewables target joins an impressive shift towards clean energy](#), June 2016

²⁰ Clean Energy Council, [Clean Energy Australia Report 2015](#), June 2016, p.7

²¹ ReNewEconomy, [Victoria aims for 40% renewables by 2025, to add 5,400MW wind and solar](#), June 2016

²² ReNew Economy, [Victoria aims for 40% renewables by 2025, to add 5,400MW wind and solar](#), June 2016

²³ Victorian Premier, [Jobs and Clean Energy Boost for South-West Victoria](#) July 2016

²⁴ Mount Ararat Wind Farm, [Background](#), 2016

²⁵ Acciona, [Mt. Gellibrand Wind Farm](#), 2016

The Australian Energy Market Operator (AEMO) lists a further 3,448MW of proposed wind farm projects in Victoria.²⁶ This is nearly three times as much as all the other proposed capacity combined, including fossil fuel plants such as gas. Taking an average of the above confirmed projects, these projects could generate over 3,200 direct and indirect jobs in regional Victoria attract more than \$7.8 billion of investment.

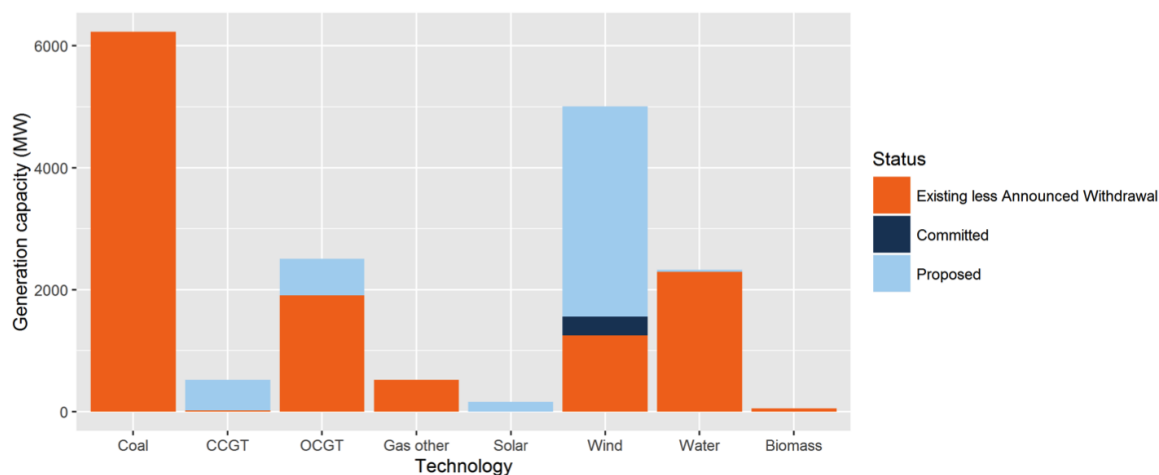


Figure 1: Installed, committed and proposed generation capacity in Victoria showing the huge volume of wind project proposals²⁷

Large scale solar also has a large role to play. The Clean Energy Finance Corporation (CEFC) received 135MW worth of large scale solar PV proposals for Victoria under a recent tender process.²⁸ These would create up to 856 jobs if they are funded and able to proceed.²⁹

These opportunities relate to large scale renewables which would be centred in regional areas, potentially providing a much-needed boost for regions. In addition, there's huge potential for the domestic solar PV industry to grow, especially with battery storage expected to become affordable and widespread by 2020.³⁰ Solar PV has the potential to create jobs wherever there are rooftops.

Energy efficiency

Strong climate action doesn't only mean jobs in renewable energy. There will be significant growth in public transport jobs and jobs in making buildings more energy efficient too, both of which are key to tackling emissions. The Victorian government has already made a good

²⁶ AEMO, [NEM AESOO 2016 - Victoria](#), August 2016

²⁷ AEMO, [NEM AESOO 2016 - Victoria](#), August 2016

²⁸ CEFC, [Funding for 2GW of large-scale solar sought from Clean Energy Finance Corporation](#), November 2015

²⁹ Based on total investment amount for recent ARENA shortlisted projects of \$1.6 billion and jobs per million figures (3) from Tim Buckley, IEEFA, July 2016, assumes \$100,000 wage rate and 30 per cent labour + services

³⁰ BNEF, [Bloomberg New Energy Outlook 2016: Executive Summary](#), June 2016, p.3

start on energy efficiency with its Victorian Energy Efficiency Target (VEET) scheme, which provides 2000 jobs for Victorians.³¹

On 22 August 2016, the government announced that it would invest \$33 million in energy efficiency across a number of government buildings (including schools and hospitals) and infrastructure (such as road lighting) using Energy Performance Contracts (EPC) to ensure the best and most efficient solutions are identified, and savings are guaranteed, measured and verified.³² This is an encouraging move but just the tip of the iceberg for an industry that could employ thousands across Victoria while saving households millions a year and decreasing emissions.

It is also an industry that could help provide employment and sustain the economies of regions like the Latrobe Valley which are being affected by the sudden closures of coal-fired power stations like Hazelwood. A recent report suggests energy efficiency could be a key part of managing the transition with a home energy efficiency retrofit program for Gippsland potentially creating up to 620 jobs over 10 years and saving Gippsland households \$58 million on their energy bills.³³

Public transport driving growth up and emissions down

Building public transport infrastructure minimises car and commercial vehicle use, cuts travel times and associated pollution and helps ease congestion in cities. Public transport infrastructure expenditure also has CO2 abatement benefits, particularly when it concentrates on public transport powered by renewable energy.

Investing in public transport:

- Minimises car and commercial vehicle travel times and therefore CO2 emissions per kilometre travelled; and
- Reduces the use of cars and commercial vehicles by changing the structure of travel towards buses, trams and trains.

This is besides the considerable economic and social benefits that flow from public transport services. Encouragingly, Infrastructure Australia and the Victorian State Government have a number of public transport initiatives on their list of priorities (see table 2).

Project	Purpose	Stage	Potential cost
Melbourne Metro Rail Project	Cranbourne, Pakenham and Sunbury lines will have their own tunnel through the CBD and three new stations.	Confirmed, expected start early 2017	\$2.9 billion

³¹ Premier Daniel Andrews, Energy Efficiency Scheme to Reduce Bills, Support Jobs, 19 December 2014. <http://www.premier.vic.gov.au/energy-efficiency-scheme-to-reduce-bills-support-jobs/>

³² Victorian Government, [Greener Government Buildings](#), August 2016

³³ Environment Victoria, [Life After Coal](#), October 2016

Regional Network Development Plan	Deliver commuter-style service for the growth areas of Geelong, Bendigo, Ballarat, Seymour and Traralgon	Underway	\$1.3 billion in 2016/17
Level-crossing removal	Remove at least 20 level crossings by 2018. These sites form the basis of a long-term strategic plan being developed to remove all 50 level crossings by 2022.	Underway	\$2.6 billion allocated up to 2018
Ballarat line upgrade	Duplicate the Ballarat line to Melton, to increase the frequency of services for the Ballarat region and Melbourne's outer west.	Underway	\$518 million in 2016-17
Mernda rail upgrade	Extending the South Morang train line to Mernda to cater for the significant population growth in Melbourne's north.	To start early 2017	\$600 million
Bayside Rail Project	Frankston line upgrade	Completion due December 2016	\$115 million

Table 2: Upcoming public transport projects in Victoria. Sources: PTV and Victorian Government

Projects such as the Metro Rail project show the state government's commitment to building infrastructure that has the potential to improve quality of life, reduce emissions and create thousands of construction and ongoing jobs. The flow-on impacts are potentially even larger, with a project like the Metro Rail projected to create 4,700 jobs at the peak of construction and boost Victoria's gross state product by a minimum of \$7 billion a year.³⁴

With more funding available for public transport through a federal commitment to strong action on climate change, regions and cities have a real chance to flourish with the opportunities these projects bring.

³⁴ Metro Tunnel, [Project Benefits](#), 2016