

Victorian Renewable Energy Target

2020/21 Progress Report



Environment,
Land, Water
and Planning

Tabled by the Minister for Energy, Environment and Climate Change, pursuant to Section 8 of the *Renewable Energy (Jobs and Investment) Act 2017*.

Photo credit

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Acknowledgment

We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it. We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

We are committed to genuinely partner, and meaningfully engage, with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations in the 21st century and beyond.



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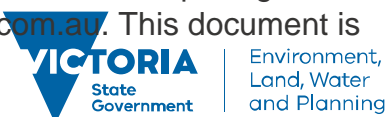
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Minister's foreword



I am pleased to report that the 2020/21 financial year has seen Victoria's renewable energy sector navigate through a challenging environment to deliver large output growth, exceed our first renewable energy target (VRET) of 25 per cent and \$1.6 billion committed to continue Victoria's renewable energy transition – the largest investment in clean energy of any Australian state, ever.

Victoria's renewable electricity generation increased by 27 per cent in 2020/21 relative to the previous period, while the share of renewable sources in Victoria's electricity generation increased to 29.4 per cent.

An impressive 3,448 megawatts (MW) of renewable energy projects are currently in the pipeline, estimated to have resulted in capital expenditure of \$1.247 billion and 1,184 jobs during the 2020/21 financial year.

Of this, 2,382 MW is from Victorian wind and solar farms that were commissioned or undergoing commissioning. Collectively, these projects worked through challenges posed by the coronavirus (COVID-19) pandemic, and complex network issues affecting the commissioning of increasing volumes

of renewable energy project in Victoria.

The Victorian Government continues to lead the renewable energy space, announcing initiatives designed to support an orderly transition to renewable energy in Victoria and help address some of the challenges that the sector is facing. The 2020/21 Victorian Budget committed \$1.6 billion to create renewable energy hubs across the state, improve crucial grid infrastructure, and decarbonise our energy system.

The package included \$540 million to invest in network infrastructure to develop Victoria's six Renewable Energy Zones (REZs). This investment will improve energy affordability and reliability outcomes for Victorian consumers. This work progressed with the announcement of procurement processes for six network support projects under Stage One of the REZ Development Plan.

Following the success of Victoria's first VRET auction, the Victorian Government has launched its second auction (VRET2), targeting at least 600 MW of new renewable energy capacity and supporting our commitment to source 100 per cent renewable electricity for government operations by 2025.

The Budget also contained funding to expand the Victorian Government's nation-leading Solar Homes program to a total of 778,500 rebates for rooftop solar, solar hot water and batteries over ten years. Over the financial year, the Solar Homes program supported more than 61,600 new rooftop PV installations with a capacity of 376 MW, while the Solar for Business program supported almost 100 small businesses in Victoria in the first two months of the program to install a further 0.6 MW of capacity.

In 2020, the Solar Homes program contributed around 1.3 per cent of Victoria's electricity generation, which was around 5 per cent of Victoria's 2020 renewable energy target of 25 per cent renewable generation. The Solar Homes program is expected to generate 15 per cent of Victoria's 40 per cent renewable energy target by 2025 and 20 per cent of Victoria's 50 per cent renewable energy target by 2030. By 2027/28, the Solar Homes program is expected to reduce Victorian electricity sector emissions by around 1.8 million tonnes of carbon dioxide equivalent per annum and reduce National Electricity Market emissions as a whole by around 3.0 million tonnes of carbon dioxide equivalent per annum, below what they would otherwise have been.

Please join me in celebrating the achievements of our renewable energy sector - and Victoria's strong progress towards our VRET targets. Our government will continue to work with the community and renewable energy industry to manage Victoria's energy transition while maintaining an affordable, reliable and secure energy system for all Victorians.

1. Background

1.1 About this report

Under the *Renewable Energy (Jobs and Investment) Act 2017* (REJI Act), Victoria legislated renewable energy targets of 25 per cent by 2020, 40 per cent by 2025 and 50 per cent by 2030.

Section 8 of the REJI Act requires the Minister for Energy, Environment and Climate Change (the Minister) to report to the Parliament for each financial year on:

- the progress made towards meeting the renewable energy targets;
- investment and employment in Victoria in relation to renewable electricity generation; and
- the performance of schemes to achieve targets under the REJI Act that promote the generation of electricity by large scale facilities that utilise renewable energy sources or convert renewable energy sources into electricity.

The reporting period for this report is the 2020/21 financial year.

This report presents an assessment of progress towards the targets and state-wide investment and employment in Victoria in relation to renewable energy generation.

The Department of Environment, Land, Water and Planning (DELWP) has based this report on the latest publicly available information from sources including the Australian Energy Market Operator (AEMO), the Clean Energy Regulator (CER), and project information received from renewable energy project developers.

1.2 The Victorian Renewable Energy Target and market development in the renewable energy sector

The Victorian Government introduced the VRET to provide greater policy certainty and investor confidence for the renewable energy industry in Victoria. The REJI Act and Victorian government initiatives in support of the targets have been important drivers of the recent development of renewable energy projects in Victoria.

The development of Victoria's renewable energy industry should be considered in the context of the market as a whole. Other important factors affecting this sector include national renewable energy policy, the cost of renewable energy technologies and conditions in Victoria's electricity network.

In particular, declining costs of renewable energy technologies¹, a need to scale up production to meet the Federal Large-scale Renewable Energy Target (LRET) after a period of uncertainty around this policy² and state government initiatives including the first VRET auction contributed to rapid growth in renewable energy project financing in Victoria and nationally in 2017 and 2018 (Figure 1).

Following this rapid growth period, renewable energy project financing in Victoria and nationally has slowed. This slowing occurred as it became apparent that sufficient projects had been financed to meet the LRET³ and as projects under construction in technically weaker areas of the grid began to experience delays in connecting to the electricity network⁴. Renewable energy project financing remained at this lower level throughout 2020/21⁵.

¹ Reserve Bank of Australia, *Renewable Energy Investment in Australia*, RBA Bulletin, March 2020. See: <https://www.rba.gov.au/publications/bulletin/2020/mar/pdf/renewable-energy-investment-in-australia.pdf>

² Clean Energy Regulator, *Quarterly carbon market report – June quarter 2021*, August 2021. See <http://www.cleanenergyregulator.gov.au/DocumentAssets/Documents/Quarterly%20Carbon%20Market%20Report%20-%20June%20Quarter%202021.pdf>

³ See footnote 2 above.

⁴ Clean Energy Council, *Renewable energy investment falls as risks mount*, August 2020. See <https://www.cleanenergycouncil.org.au/news/renewable-energy-investment-stalls-as-risks-mount>

⁵ See footnote 2 above.

Figure 1: Renewable energy project capacity committed by quarter in Australia since 2016, MW



Source: Clean Energy Regulator, Quarterly carbon market report – June quarter 2021, August 2021.

2. Progress towards the VRET targets

Highlights

- Over the 2020/21 financial year, renewable energy sources accounted for approximately 29.4 per cent of Victoria's electricity generation, up from 24.3 per cent in 2019/20.
- The growth of Victoria's renewable electricity generation over 2020/21 enabled Victoria to exceed its first VRET target of 25 per cent renewable generation by 2020.
- As at 30 June 2021, there were 21 renewable energy projects under construction or undergoing commissioning in Victoria. These projects have a combined capacity of 2,619 MW.
- This large volume of Victorian renewable energy projects under construction or undergoing commissioning, as well as the continuing strong investment in rooftop PV systems by Victorian homes and businesses, has Victoria well placed to achieve its VRET target of 40 per cent renewable generation by 2025.

2.1 Victoria's current electricity generation profile

Renewable energy generation

In the 2020/21 financial year, Victoria generated around 15,066 gigawatt hours (GWh) of electricity from VRET eligible renewable energy sources (Table 1). This renewable electricity generation accounted for around 29.4 per cent of the 51,193 GWh of electricity generated in Victoria in 2020/21 from all sources⁶. The major contributors to renewable generation in Victoria over the 2020/21 financial year were wind generation (about 14.8 per cent), solar power including both large-scale solar and rooftop PV (8.3 per cent) and hydroelectricity (5.3 per cent).

Table 1: Victorian electricity generation by source, 2020/21 financial year

Source	GWh	Share (%)
Brown coal	34,122	66.7
Gas	1,741	3.4
Renewable energy		
- Wind	7,560	14.8
- Solar (rooftop PV)	2,911	5.7
- Hydroelectricity	2,701	5.3
- Solar (large scale)	1,313	2.6
- Bioenergy (renewable energy sources eligible under VRET) ⁷	582	1.1
Other (renewable energy sources non-eligible under VRET)	265	0.5
Total eligible renewable energy	15,066	29.4
Total all renewable energy	15,330	29.9
Total	51,193	100.0

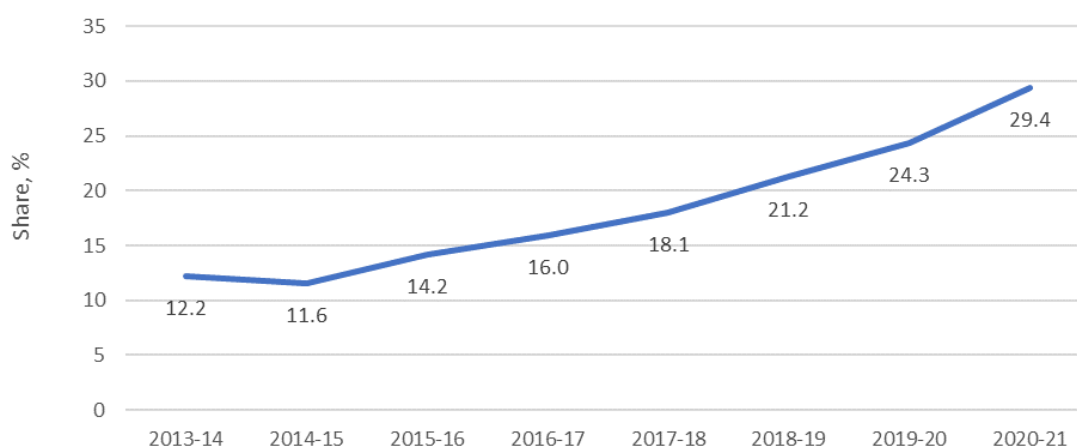
⁶ The share of renewable generation from all sources (VRET eligible and ineligible) in 2020/21 was 29.9 per cent of Victoria's total electricity generation.

⁷ Bioenergy from native forest wood waste is not included as an eligible renewable energy source under VRET, as per the Minister's declaration of renewable energy sources on 29 June 2018. Victorian Government Gazette No. S318. Throughout this report, references to 'eligible renewable generation' should be interpreted as referring to the renewable generation sources that are eligible to contribute to VRET.

Source: NEM Review, Metered generation (as generated), extracted on 2 July 2021⁸ except for bioenergy (based on Australian Government Department of Industry, Science, Energy and Resources, Australian Energy Statistics)⁹ and some small generators (based on Departmental estimates)¹⁰. Note: Totals may not sum due to rounding.

The share of renewable energy in Victoria’s electricity generation has increased steadily in recent years from around 11.6 per cent in 2014/15 and 14.2 per cent in 2015/16 to approximately 29.4 per cent over the 2020/21 financial year (Figure 2). In calendar year 2020, renewable energy sources generated roughly 26.6 per cent of Victoria’s electricity, enabling Victoria to exceed its first renewable energy target of 25 per cent renewable energy generation by 2020. The Solar Homes program contributed around 1.3 per cent of Victoria’s electricity generation in 2020, which was around 5 per cent of Victoria’s 2020 renewable energy target.

Figure 2: Victorian renewable electricity generation share, 2013/14 to 2020/21



Source: Please refer to Table 1 for sources.

The increase in Victoria’s renewable electricity generation over this period has come from new wind and solar farms and the installation of rooftop PV systems across the state, which has been supported by the Solar Homes program since 2018. The Solar Homes program is expected to generate 15 per cent of Victoria’s 40 per cent renewable energy target by 2025 and 20 per cent of Victoria’s 50 per cent renewable energy target by 2030.

Installed renewable energy generation capacity

As of 30 June 2021, Victoria had 8,374 MW of installed capacity from all sources of renewable energy eligible to contribute to Victoria’s renewable energy targets – hydroelectricity, wind, solar (including both large-scale

⁸ NEM Review is an Australian electricity data service prepared by Global Roam and subscribed to by DELWP. NEM Review’s metered generation data is based on AEMO’s actual 5-minute electricity generation data for scheduled generating units, semi-scheduled generating units and non-scheduled generating units and estimated output of rooftop solar PV systems from AEMO’s Australian Solar Energy Forecasting System. The NEM Review data captures the vast majority of Victorian electricity generation with some exceptions – see footnotes 9 and 10, below.

⁹ NEM Review does not include data for Victorian bioenergy generation. Estimated electricity generation from bioenergy generation is instead sourced from the Australian Energy Statistics, Table O Electricity generation by fuel type 2019/20 and 2020. Note that this update did not include data for 2020/21 so data from 2019/20 was used as a proxy for 2020/21.

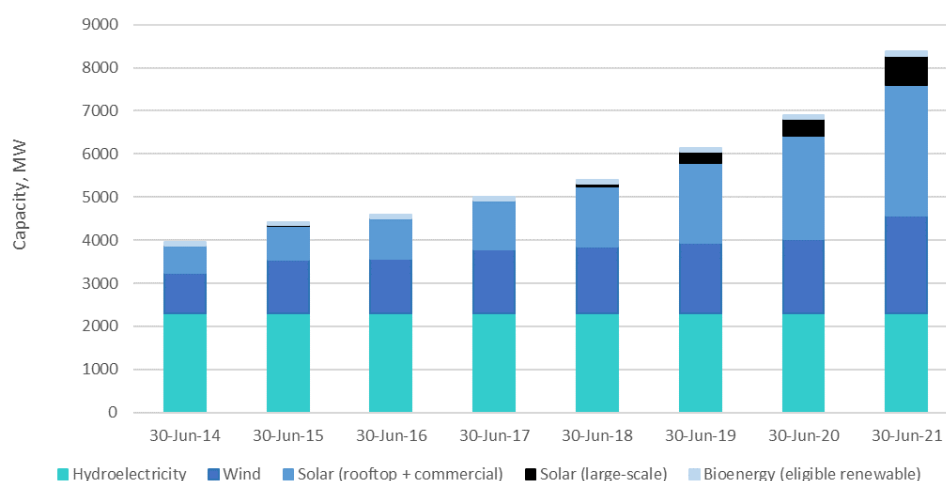
¹⁰ Electricity generation volumes for some small generators – Chepstowe (6.1 MW), Codrington (18.2 MW), Leonard’s Hill (4.1 MW), Toora (21 MW), Wonthaggi (12 MW), Coonooer Bridge (19.8 MW), Maroona (7.2 MW), Timboon West (7.2 MW) and Yawong (7.2 MW), Swan Hill (14.4 MW), Numurkah APSU (6 MW), ACEnergy Girgarre 1 and 2 (5 MW each), ACEnergy Echuca (5 MW), ACEnergy Stanhope 1,2,3 and 4 (5 MW each), ACEnergy Katamatite (5 MW), ACEnergy Numurkah 1 and 2 (5 MW each), Robinvale (9.2 MW), Longford (46.4 MW), Qenos (21 MW), ACEnergy Wunghnu (5 MW), Melbourne Airport (12 MW), Ferguson (12 MW), and Waurn Ponds Smart Energy Project (7 MW) – are not reported by NEM Review. Annual output of these generators is estimated by the Department.

solar and rooftop PV) and bioenergy excluding native forest wood waste¹¹ (Figure 3). This compares to 6,902 MW of installed capacity at 30 June 2020¹².

In 2020/21, Solar Victoria’s Solar Homes Program supported 61,651 new rooftop PV installations in Victoria (for both owner-occupier households and rental providers), with an estimated capacity of 376 MW of rooftop PV installed. The Solar Homes program has supported 970 MW of rooftop PV systems in Victoria since its commencement.

Victoria’s commissioned renewable energy capacity increased by 4,411 MW between the end of June 2014 and the end of June 2021. This is mainly driven by the installation of rooftop solar PV systems and the commissioning of large-scale wind and solar farms. Over this period, rooftop PV capacity increased by 2,393 MW, wind capacity increased by 1,329 MW, large-scale solar capacity increased by 680 MW and bioenergy capacity increased by 11 MW.

Figure 3: Victorian renewable electricity generation capacity, 2013/14 to 2020/21



Source: Based on AEMO, Generation information for Victoria¹³; CER, Small-scale postcode data¹⁴ and CER data on accredited power stations¹⁵ and other generation project information¹⁶.

Emissions reduction

Victoria’s electricity sector greenhouse gas emissions have fallen from around 60.1 million tonnes (Mt) of CO₂-e in 2014/15 to around 40.6 Mt of CO₂-e in 2020/21 (Figure 4). This reduction has been driven by both the retirement of the Hazelwood Power Station in March 2017, and the growth of renewable electricity generation in Victoria over this period.

¹¹ See footnote 7

¹² The 2019/20 VRET Progress Report reported a total installed renewable energy capacity of 6,881 MW, which was derived from the most up to date information at the time of publishing. This capacity has been updated for the 2020/21 VRET Progress Report with the most recent data for 2019/20 from AEMO Generation Information and the CER small-scale postcode data for solar installations (see footnotes 17 and 18). This change reflects updated rooftop PV data from the CER.

¹³ AEMO Generation information spreadsheets for Victoria dated 30 May 2014, 13 August 2015, 11 August 2016, 29 December 2017, 8 August 2019, 30 April 2020 and 7 July 2021 were used in developing this data. See <https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/forecasting-and-planning-data/generation-information>

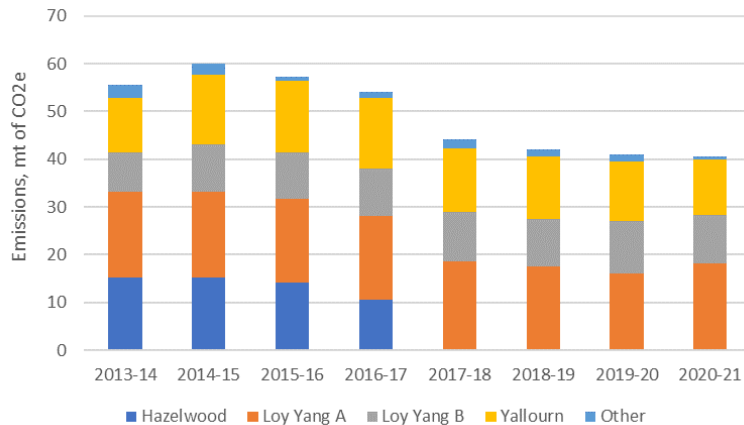
¹⁴ CER small-scale postcode data for solar installations from 2014 through to 2019 is sourced from historical data available on the CER website at <http://www.cleanenergyregulator.gov.au/RET/Forms-and-resources/Postcode-data-for-small-scale-installations/historical-postcode-data-for-small-scale-installations>. CER small-scale postcode data for solar installations from 2020 onwards is sourced from CER postcode data as at 31 July 2021 available at <http://www.cleanenergyregulator.gov.au/RET/Forms-and-resources/Postcode-data-for-small-scale-installations>

¹⁵ The CER’s data on accredited power stations up to the end of 2019 is available at <http://www.cleanenergyregulator.gov.au/RET/About-the-Renewable-Energy-Target/Large-scale-Renewable-Energy-Target-market-data/large-scale-renewable-energy-target-supply-data/historical-large-scale-renewable-energy-target-supply-data>. The CER’s data on accredited power stations in 2021 is available at: <http://www.cleanenergyregulator.gov.au/RET/About-the-Renewable-Energy-Target/Large-scale-Renewable-Energy-Target-market-data/large-scale-renewable-energy-target-supply-data>

¹⁶ This information includes publicly available information from project websites and media releases and information that DELWP has obtained directly from project proponents.

In 2020/21, the Solar Homes program is estimated to have reduced emissions in the National Electricity Market by 0.36 Mt of CO₂e below what they would otherwise have been. By 2027/28, the Solar Homes program is expected to reduce electricity sector emissions in Victoria and the National Electricity Market by around 1.8 and 3.0 Mt of CO₂e per annum respectively below what they would otherwise have been.

Figure 4: Emissions from electricity generation in Victoria, 2013/14 to 2020/21



Source: NEM Review, Greenhouse emissions, extracted 9 July 2021.

2.2 Renewable energy development

Renewable energy generation projects commissioned in 2020/21

In the 2020/21 financial year, Victoria's renewable energy capacity increased by 1,472 MW (Table 2). This growth was driven by the:

- commissioning of the Cherry Tree, Murra Warra (stage 1), Lal Lal (Elaine), Ferguson and Berrybank (stage 1) wind farms;
- commissioning of the Bannerton, Glenrowan West, Girgarre 2, Stanhope 2, 3, and 4, Wunghnu, Numurkah 2, Melbourne Airport and Waurn Ponds Smart Energy Project solar farms;
- installation of 626 MW of rooftop solar panels by Victorian homes and businesses.

Table 2: Change in Victorian renewable electricity generation capacity in 2020/21

Project	Technology	Capacity (MW)	Location	Commissioned
Cherry Tree	Wind	57.6	15 km south east of Seymour	Q3 2020
Murra Warra (stage 1)	Wind	226	25 km north of Horsham	Q2 2021
Lal Lal (Elaine)	Wind	84	25 km south of Ballarat	Q1 2021
Ferguson	Wind	12	9.5 km north of Princetown	Q2 2021
Berrybank	Wind	180	60 km south west of Ballarat	Q2 2021
Subtotal – wind		560		
ACEnergy Girgarre 2	Large-scale solar	5	Curr Rd, Girgarre	Q4 2020
ACEnergy Stanhope 2	Large-scale solar	5	West Rd, Stanhope	Q4 2020
ACEnergy Stanhope 3	Large-scale solar	5	Hill Rd, Stanhope	Q4 2020
ACEnergy Stanhope 4	Large-scale solar	5	Middle Rd, Stanhope	Q4 2020

Project	Technology	Capacity (MW)	Location	Commissioned
ACEnergy Wunghnu	Large-scale solar	5	Goulburn Valley Highway, Wunghnu	Q4 2020
ACEnergy Numurkah 2	Large-scale solar	5	Naring Rd, West Numurkah	Q1 2021
Melbourne Airport (btm*)	Large-scale solar	12	Melbourne Airport (Tullamarine)	Q1 2021
Wauron Ponds Smart Energy Project (btm*)	Large-scale solar	7	Wauron Ponds Campus	Q3 2020
Glenrowan West	Large-scale solar	132	Chivers Rd, Glenrowan West	Q2 2021
Bannerton	Large-scale solar	88	Knight Rd, Bannerton	2020
Rooftop PV (a)	Rooftop PV	626	State wide	Year round
Subtotal – solar¹⁷		908		
Subtotal – bioenergy¹⁸		5		
Total		1472		

Note: (a) includes both small-scale rooftop PV installations and commercial scale rooftop PV installations. * “btm” refers to behind-the-meter solar generation. Totals may not sum due to rounding. Sources: Information on the large-scale solar projects was obtained from public and private sources¹⁹. Small-scale rooftop PV capacity is sourced from CER, Small-scale postcode data²⁰ while commercial scale rooftop PV capacity is sourced from CER data on accredited power stations²¹.

Renewable energy generation projects under construction or undergoing commissioning

As at 30 June 2021, there were 2,619 MW of renewable energy projects under construction or undergoing commissioning in Victoria (Table 3). This comprises ten wind farms projects with a combined capacity of around 2,143 MW and eleven solar farms with a combined capacity of 476 MW.

Table 3: Victorian renewable energy projects under construction or commissioning as at 30 June 2021

Project	Technology	Capacity (MW)	Location	Estimated commissioning ²²
Berrybank (stage 2)	Wind	109	60 km south west of Ballarat	Q1 2022
Bulgana	Wind	204	20 km north of Ararat	Q4 2021
Diapur (formerly Nhill)	Wind	7	19 km west of Nhill	Q4 2021
Dundonnell	Wind	336	23 km north east of Mortlake	Q4 2021
Lal Lal (Yendon)	Wind	144	25 km south of Ballarat	Q3 2021
Moorabool	Wind	312	25-30 km south east of Ballarat	Q1 2022
Mortlake South	Wind	158	5 km south of Mortlake	Q2 2022
Mt Gellibrand	Wind	132	25 km east of Colac	2022

¹⁷ Includes a 13 MW increase in Karadoc solar farm’s capacity as reported by AEMO.

¹⁸ Includes a 5 MW increase in Victoria’s bioenergy because of a 4.5 MW expansion at the Truganina landfill gas facility and the commissioning of a 0.2 MW system at the Melton waste water plant.

¹⁹ See footnotes 13 and 15 above.

²⁰ See footnote 14 above.

²¹ See footnote 15 above.

²² Estimated commissioning dates are based on the best available information to DELWP at the time of reporting. This includes information available from AEMO and project proponents. These dates are estimates only and subject to change.

Project	Technology	Capacity (MW)	Location	Estimated commissioning ²²
Murra Warra (s 2)	Wind	209	25 km north of Horsham	Q2 2022
Stockyard Hill	Wind	532	35 km west of Ballarat	Q1 2022
Subtotal – wind		2,143		
ACEnergy Yarroweyah	Large-scale solar	5	Montgomery Rd, Yarroweyah	Q4 2021
ACEnergy Bamawm	Large-scale solar	5	Middleton Road, Bamawm	Q4 2021
ACEnergy Pine Lodge	Large-scale solar	5	Midland Highway, Pine Lodge	Q4 2021
ACEnergy Tatura	Large-scale solar	5	Midland Highway, Tatura	Q4 2021
ACEnergy Stanhope 5	Large-scale solar	5	Stokes Rd, Stanhope	Q4 2021
Cohuna	Large-scale solar	34	Kerang-Leitchville Road Horfield	Q4 2021
Kiamal (s 1)	Large-scale solar	200	Calder Highway, Ouyen	Q4 2021
McCain (btm*)	Large-scale solar	7	Ballarat	Q3 2022
Winton	Large-scale solar	99	Winton-Glenrowan Rd, Winton	2021
Yatpool	Large-scale solar	93	Doering Road, Carwarp	Q4 2021
Melbourne Water (btm*)	Large-scale solar	19	Bangholme, Melbourne	Q1 2022
Subtotal – solar		476		
Total – wind and solar		2,619		

Note: * “btm” refers to behind-the-meter solar generation. Totals may not sum due to rounding. Projects are reported by nameplate capacity as reported by AEMO, Generation Information, dated 7 July 2021²³. Sources: Information on all projects was obtained from public and private sources²⁴.

2.3 Investment and employment

Highlights

- **Large-scale renewable projects in development** (3,448 MW) in Victoria over the 2020/21 financial year are estimated to support around \$1.247 billion in capital expenditure and around 1,184 jobs in the 2020/21 financial year.
- Over the whole period from project commencement to completion, these projects are estimated to support \$6.27 billion in capital expenditure and 5,456 jobs.
- In addition to the jobs supported through the construction of large-scale renewable energy projects, rooftop solar PV installations completed in 2020/21 are estimated to have supported a further 3,632 jobs.

The installation and operation of renewable energy facilities attracts investment to the State, contributing to jobs growth and economic activity in Victoria. This section of the report discusses the investment and employment outcomes for Victoria’s renewable energy sector in 2020/21.

²³ Projects contracted with the Victorian Government are reported by the capacity as reported by the project proponents, to ensure consistency across the government’s reporting of these projects. For other projects except for Berrybank stage 2, nameplate capacities from AEMO’s Generation Information spreadsheet dated 7 July 2021 have been used. See <https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/Generation-information>. Capacity for Berrybank stage 2 was sourced from <https://www.berrybankwindfarm.globalpower-generation.com.au/>

²⁴ See footnotes 16 above.

Investment and employment from large-scale renewable energy projects commissioned or under construction in Victoria during 2020/21 are based primarily on information provided to DELWP by renewable energy project proponents. Victoria's small-scale solar industry is also an important driver of jobs and investment in Victoria. DELWP estimates that Victoria's rooftop solar PV industry supported approximately 3,632 jobs in 2020/21²⁵.

Investment and employment from large-scale renewable generation projects

Based on information available to DELWP²⁶, it is estimated that the large-scale renewable generation projects in development in Victoria during the financial year 2020/21 generated \$1.247 billion in capital expenditure and 1,184 jobs over the 2020/21 financial year (Table 4)²⁷. Over the whole period from project commencement to completion, these projects are estimated to support \$6.27 billion in capital expenditure and 5,456 jobs. Projects in development during 2020/21 include projects that were commissioned during 2020/21 or were under construction or undergoing commissioning as at 30 June 2021.

Table 4: Estimated capital expenditure and jobs associated with Victorian large-scale renewable energy projects in development in 2020/21

	Capacity (MW)	Capex (\$m)		Jobs	
		In 2020/21	Over project life	In 2020/21	Over project life
Wind	2,703	935	4,956	689	3,789
Solar	745	311	1,314	495	1,667
Total	3,448	1,247	6,270	1,184	5,456

Source: Information sourced directly from project proponents and publicly available information from project websites and media articles. Note the capex and jobs figures for 2020/21 are an estimate of the proportion of the total capex and jobs from project commencement to completion that occurred in the 2020/21 financial year. Totals may not sum due to rounding.

Wind farm projects in development during 2020/21 are expected to account for around \$935 million in capital expenditure and 689 jobs over 2020/21, while solar projects in development during 2020/21 are expected to account for around \$311 million in capital expenditure and 495 jobs in 2020/21.

Investment and employment by region

As Victoria's renewable energy facilities are being constructed in parts of the state with very strong renewable energy resources, the economic activity associated with renewable energy construction will benefit these regions. The areas of western Victoria, including the Central Highlands, Wimmera Southern Mallee, Barwon and the Great South Coast have particularly good wind resources and have attracted much of Victoria's wind farm investment (Table 5). In the same vein, large-scale solar project development has occurred in Victoria's north to capture the higher levels of solar irradiation in those parts of Victoria relative to the rest of Victoria. More recent large-scale solar project investment has moved east towards Goulburn and the Ovens Murray districts in response to more favourable network conditions in those areas.

Table 5: Overview of renewable energy project development activity in Victoria during 2020/21, by region²⁸

	Capacity (MW)		Capex (\$m)		Jobs	
	Wind	Solar	Wind	Solar	Wind	Solar

²⁵ Based on data from the Clean Energy Regulator and the employment multiplier for rooftop PV reported in Rutovitz, J., et al. (2020) *Renewable Energy Employment in Australia: Methodology*. Prepared for the Clean Energy Council by the Institute for Sustainable Futures, University of Technology Sydney.

²⁶ This information includes publicly available project information from websites and media articles, and information obtained by DELWP from project proponents. Note that whole-of-project renewable energy project jobs figures are reported here in the same terms as they were provided by the proponents.

²⁷ Construction jobs for 2020/21 have been estimated by apportioning the construction jobs figure reported by project proponents by the number of months in 2020/21 that the project was under construction relative to the project's total construction period. Operational jobs for 2020/21 have been estimated by apportioning the operational jobs figure reported by project proponents by the number of months in 2020/21 that the project was generating. DELWP notes that jobs figures are difficult to define and that this approach is an approximation.

²⁸ Regional definitions in this table are based on Regional Development Victoria's Regional Partnerships classifications at: <https://www.rdv.vic.gov.au/regional-partnerships>

	Capacity (MW)		Capex (\$m)		Jobs	
Barwon and Great South Coast	927	7	320	C	282	C
Central Highlands	1072	7	341	C	276	C
Goulburn	58	30	6	30	9	104
Loddon Campaspe	0	25	0	34	0	123
Mallee	0	415	0	0	0	34
Ovens Murray	0	231	0	223	0	213
Wimmera Southern Mallee	646	0	269	0	121	0
Metropolitan	0	31	0	18	0	12
Total	2,703	745	935	311	689	495

Source: Information sourced directly from project proponents and publicly available information from project websites and media articles. C = Not reported as results reflect single projects. Totals may not sum due to rounding.

3. Closing statement

The VRET 2020/21 Progress Report provides a review of data and key statistics on the status and trends of the development of the renewable energy sector in Victoria, with a focus on outcomes achieved over the 2020/21 financial year.

Overall, 2020/21 saw Victoria's renewable energy industry progress through a challenging environment to record increased generation and achieve Victoria's 2020 VRET target. This output growth occurred as a number of large-scale renewable generators completed commissioning, while others completed or substantially completed construction and began the commissioning process. Activity in Victoria's small-scale solar sector remained at a high level despite the COVID-19 pandemic as Victorian households and businesses continued to embrace rooftop solar generation and the Victorian Government's Solar Homes program.

As in 2019/20 the capacity of new projects commencing construction remained below the high levels recorded in 2017/18 and 2018/19. Two large Victorian renewable projects above 20 MW – the second stages of the Murra Warra and Berrybank wind farms – were able to commence construction in 2020/21, while 10 projects in the 5-20 MW capacity range, including some behind the meter projects, also commenced construction in 2020/21.

A synthesis of the key findings with respect to the reporting requirements under the REJI Act are set out in Table 6 below.

Table 6: VRET 2020/21 Progress Report – synthesis of findings

Reporting requirements	Financial year 2020/21	Section with further detail
Progress made towards meeting the renewable energy targets	Renewable energy generation accounted for 29.4 per cent of Victoria's electricity generation over the financial year. In the 2020 calendar year, renewable energy sources generated 26.6 per cent of Victoria's electricity, exceeding Victoria's 2020 renewable energy target of 25 per cent renewable generation.	Section 2.1
Investment and employment in Victoria in relation to renewable electricity generation	Victoria's commissioned small and large-scale renewable energy capacity increased by around 1,472 MW. Ten large-scale solar farms and five large scale wind farms with a combined capacity of 828 MW were commissioned in Victoria in 2020/21. As at 30 June 2021, Victoria had ten wind farms and eleven solar farms with a combined capacity of 2,619 MW under construction or undergoing commissioning.	Section 2.2
	Projects commissioned during 2020/21 or under construction or undergoing commissioning as at 30 June 2021 are estimated to have resulted in capital expenditure of \$1.247 billion and around 1,184 jobs in 2020/21.	Section 2.3