

Victorian Renewable Energy Target

2017-18 Progress Report



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



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Minister's foreword



Victoria, along with the rest of the world, is in the midst of a major energy transformation. The Victorian Government recognises the need for a modern energy system to support our economy and way of life - a system that is renewable, reliable and affordable.

In June 2016, the government committed to Victorian renewable energy generation targets of 25 per cent by 2020 and 40 per cent by 2025. The *Renewable Energy (Jobs and Investment) Act 2017* legislates these Victorian Renewable Energy Targets (VRET), creating certainty for investment in Victoria.

The VRET policy is expected to:

- deliver between 3,400 megawatts (MW) and up to 5,400 MW of new large-scale renewable energy capacity by 2025;
- put downward pressure on electricity prices and contribute to Victoria's electricity supply;
- support capital expenditure of up to \$7.2 billion in renewable energy projects; and
- create up to 10,000 jobs over the life of the scheme (including two-year construction jobs and associated flow-on jobs across the Victorian economy), particularly in regional Victoria.

Here, I present to Parliament the first report on the progress towards meeting the VRET.

I am proud to report that under the Andrews Labor Government's decisive leadership, Victoria is experiencing significant investment in new renewable energy generation, and as a result we are on track to meet the 25 per cent by 2020 target. The 1,838 MW of renewable energy projects that either completed construction over the past year or were still under construction as at 30 June 2018 will create almost 3,000 new jobs in regional Victoria, and result in more than \$3.6 billion in capital expenditure.

To support the achievement of its targets, the government launched the VRET 2017 Reverse Auction for up to 650 MW of new large scale renewable energy generating capacity. The Reverse Auction attracted significant interest from the renewable energy industry, with submitted proposals oversubscribing our tender by more than five-fold. Successful renewable energy projects will provide a total of 928 MW of additional renewable generating capacity in Victoria, supporting about 900 jobs and \$1.1 billion of capital investment. The auction outcomes will deliver value for money for the State, improving electricity supply and putting downward pressure on wholesale power prices for Victorians.

Our government is committed to providing outstanding leadership in renewable energy. Recently, we announced the Solar Homes initiative – a commitment to provide half price solar panels for up to 650,000 homes, half price batteries for up to 10,000 homes, and \$1,000 rebates for 60,000 households to install a new solar hot water system. Together, our hard work will ensure the achievement of our ambitious renewable energy targets. I encourage you to join me in celebrating our significant progress to date, and I look forward to further milestones in our transition to a clean energy future.

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 and 40 per cent by 2025. The REJI Act also supports schemes to achieve the targets while encouraging investment and employment in Victoria.

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.

This is the first report delivered since the REJI Act commenced on 15 December 2017. The reporting period for this report is the 2017-18 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 performance of the VRET 2017 Reverse Auction – a scheme designed to support the achievement of the targets with successful projects¹ announced in September 2018 – will be reported on in the 2018-19 VRET Progress Report.

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 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 is one of the key drivers contributing to the development of renewable energy projects in Victoria.

The growth of the renewable energy industry in Victoria 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 energy technologies and private sector investment, outlined further below.

- **The Federal Large-Scale Renewable Energy Target (LRET):** Following the Commonwealth Government's review of the policy, in June 2015 the LRET target was reduced from 41,000 gigawatt hours (GWh) to 33,000 GWh of renewable energy generation by 2020². Despite the reduced target, LRET policy settings along with the introduction of the VRET have provided significant policy certainty to the renewable energy sector. The VRET will continue to provide investor certainty in Victoria through to 2025. However, at the national level there is no policy certainty to support the renewable energy industry post-2020.
- **The cost of renewable energy technologies** such as wind and solar PV is declining rapidly enabling new-build renewables to become more competitive in the energy market compared to existing thermal electricity generation including coal-fired power stations and gas-fired generators. New-build renewables are already significantly cheaper than new-build thermal generators³.
- **Private sector investment** has increased, with recent market information showing that corporate Power Purchasing Agreements (PPAs) with renewable energy facilities are becoming more prevalent. In Victoria, more than 800 MW of new renewable energy capacity has been contracted through corporate PPAs in the 2017-18 financial year. Prior to 2017-18, not a single MW of renewable energy capacity had been

¹ Berrybank Wind Farm (180 MW); Carwarp Solar Farm (122 MW); Cohuna Solar Farm (34 MW); Dundonnell Wind Farm (336 MW); Mortlake South Wind Farm (157 MW); and Winton Solar Farm (98.8MW).

² Note that the Legislation governing the LRET is set till 2030.

³ Bloomberg New Energy Finance, 1H 2018 Levelised Cost of Energy (LCOE) Update - Australia.

contracted through corporate PPAs in Victoria⁴. This reflects the improving investor confidence in Victoria and cost competitiveness of renewables.

⁴ In the 2017-18 financial year, more than 800 MW of new renewable energy capacity was contracted through corporate PPAs. Those projects include wind farms at Murra Warra, Crowlands and Lal Lal; solar farms at Kiamal, Karadoc, Numurkah. See <https://www.energetics.com.au/insights/thought-leadership/corporate-ppas-deliver-34-of-generation-capacity-required-under-the-ret/>

2. Progress towards the VRET targets

The REJI Act legislates that renewable energy sources must provide 25 per cent of all Victorian electricity generation by 2020 and 40 per cent of all Victorian electricity generation by 2025.

On 28 December 2017, the Minister for Energy, Environment and Climate Change determined that the minimum renewable energy capacity required to meet the 2020 target is 6,341 MW⁵. This amount is the total volume of all renewable energy generation capacity that Victoria is estimated to need in order to meet its 2020 renewable energy target, including existing renewable energy capacity and new-build capacity.

Under the Act, the Minister is required to determine the minimum capacity required to meet the 2025 target by 31 December 2019.

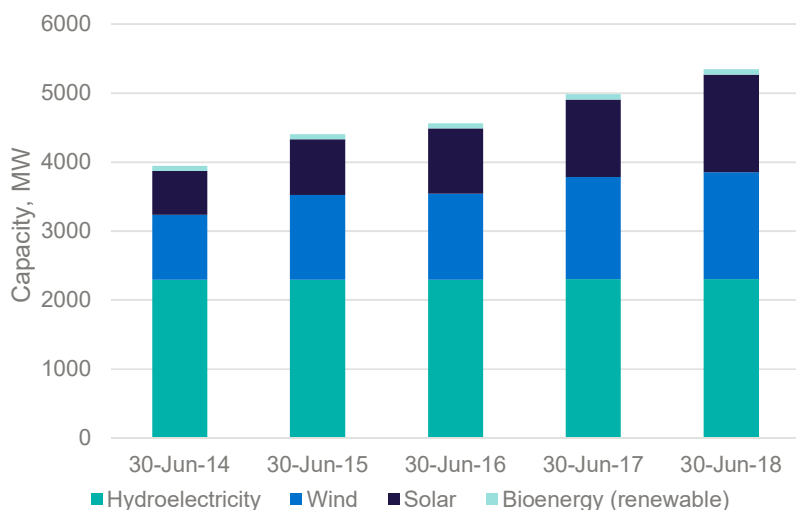
2.1 Victoria's current electricity generation profile

Installed renewable energy generation capacity

As of 30 June 2018, Victoria had 5,345 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 solar and rooftop PV) and bioenergy excluding native forest wood waste⁶ (Figure 1). This compares to around 4,983 MW of installed capacity at 30 June 2017.

Victoria's installed renewable energy capacity has increased by 1,387 MW since the end of June 2014. This is mainly driven by commissioning of new solar and wind farms. Specifically, solar capacity increased by 776 MW and wind capacity increased by 614 MW, while hydroelectric generation capacity decreased by 7 MW and bioenergy capacity increased by 4 MW⁷.

Figure 1: Victorian renewable electricity generation capacity, 2014 to 2018



Source: Based on AEMO, *Generation information for Victoria*⁸; CER, *Small-scale postcode data*⁹ and Renewable Energy Certificate Registry (REC Registry) of accredited power stations¹⁰ and other generation project information¹¹.

⁵ Victorian Government Gazette No. S466. This amount was determined in December 2017 by estimating a plausible Victorian electricity generation capacity mix and associated electricity generation profile for 2020 that achieved 25 per cent renewable energy generation. For the purpose of the determination, it was assumed that additional large-scale renewable energy capacity would be 80 per cent wind energy and 20 per cent solar PV.

⁶ Bioenergy from native forest wood waste is not included as an eligible renewable energy source, as per the Minister's declaration of renewable energy sources on 29 June 2018. Victorian Government Gazette No. S318.

⁷ The reduced hydroelectric capacity reflects a small reduction in the capacity of the Bogong-Mackay hydroelectric station as reported by AEMO over this period.

⁸ AEMO Generation information spreadsheets for Victoria dated 30 May 2014, 13 August 2015, 11 August 2016 and 29 December 2017 were used in developing this data. See <https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/Generation-information>

Renewable energy generation

In the 2017-18 financial year, Victoria generated around 8,814 gigawatt hours (GWh) of electricity from eligible renewable energy sources (Table 1). This renewable electricity generation accounted for around 18.3 per cent of the 48,121 GWh of electricity generated in Victoria in 2017-18 from all sources. The major contributors to renewable generation in Victoria over the 2017-18 financial year were wind generation (about 8.8 per cent), hydroelectricity (5.5 per cent) and solar power including both large-scale solar and rooftop PV (3.0 per cent).

Table 1: Victorian electricity generation by source, 2017-18 financial year

Source	GWh	Share (%)
Brown coal	36,107	75.0
Gas	2,976	6.2
Renewable energy		
- Hydroelectricity	2,652	5.5
- Wind	4,223	8.8
- Bioenergy (renewable energy sources eligible under VRET) ¹²	489	1.0
- Solar (rooftop and large scale)	1,450	3.0
Other (renewable energy sources non-eligible under VRET)	224	0.5
Total eligible renewable energy	8,814	18.3
Total	48,121	100.0

Source: NEM Review, Metered generation (as generated), sourced 24 July 2018¹³ except for bioenergy (based on Australian Government Department of the Environment and Energy, Australian Energy Statistics)¹⁴ and some small wind farms (based on Departmental estimates)¹⁵

The share of renewable energy in Victoria's electricity generation has increased steadily in recent years from around 12.5 per cent in 2013-14 and 11.8 per cent in 2014-15 to approximately 18.3 per cent over the 2017-18 financial year (Figure 2).

⁹ CER small-scale postcode data for solar installations from 2014 through to 2016 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 2017 onwards is sourced from CER postcode data as at 30 June 2018 available at <http://www.cleanenergyregulator.gov.au/RET/Forms-and-resources/Postcode-data-for-small-scale-installations>

¹⁰ The CER's REC Registry of Accredited Power Stations is available at <https://www.rec-registry.gov.au/rec-registry/app/public/power-station-register>. This information is supplemented with information contained in the CER's list of power stations accredited in 2018 - <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> and 2017 accredited power stations data - <https://www.rec-registry.gov.au/rec-registry/app/public/power-station-register>

¹¹ Other generation project information was used to update 2017 AEMO data for recent project developments. This information includes publicly available information from project websites and media releases and information that DELWP has obtained directly from project proponents.

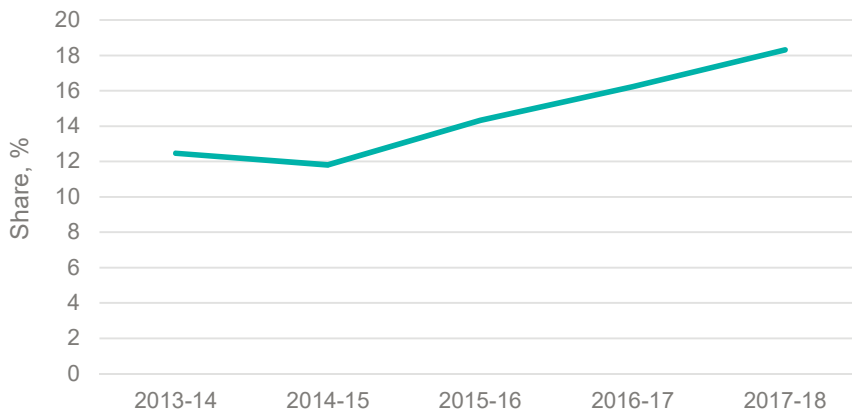
¹² Bioenergy from native forest wood waste is not included as an eligible renewable energy source under VRET, as per the Minister's declaration of renewable energy sources on 29 June 2018. Victorian Government Gazette No. S318.

¹³ NEM Review is an Australian electricity data service prepared by Global Roam and subscribed to by the Department. 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 below 13 and 14.

¹⁴ 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, April 2018. Note that the April 2018 update did not include data for 2017-18 so data from 2016-17 was used as a proxy for 2017-18.

¹⁵ Electricity generation volumes for some small wind farms – Chepstowe (6.1 MW), Codrington (18.2 MW), Hepburn (4.1 MW), Toora (21 MW), Wonthaggi (12 MW) and Coonooer Bridge (19.8 MW) – are not reported by NEM Review. Annual output of these wind farms is estimated by the Department by applying a 30 per cent capacity factor to each wind farm. This capacity factor is based on the historical performance of Victorian wind farms.

Figure 2: Victorian renewable electricity generation share, 2013-14 to 2017-18

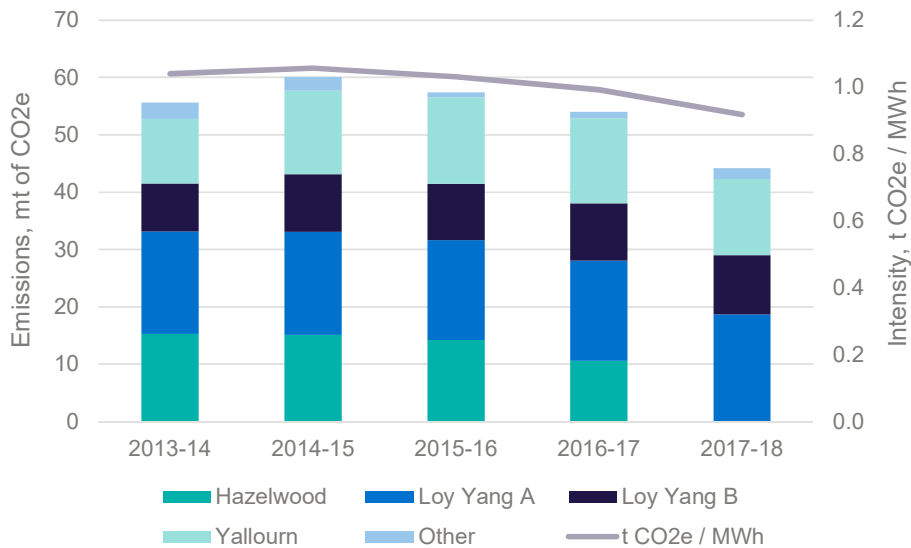


Source: Please refer to Table 1 sources

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 44.2 Mt of CO₂-e in 2017-18 (Figure 3). 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. Victoria's electricity sector emissions intensity over the 2017-18 financial year was 0.92 t CO₂-e per MWh generated¹⁶.

Figure 3: Emissions and emissions intensity of Victorian electricity generation, 2013-14 to 2017-18



Source: NEM Review, Greenhouse emissions, sourced 24 July 2018 and Victorian electricity generation data (refer to Table 1 sources).

¹⁶ Emissions intensity is calculated as the total carbon dioxide equivalent emissions produced by Victorian electricity generators over the reporting period divided by total Victorian electricity generation (measured on an as generated basis which includes generators' own consumption of electricity) over the period. The electricity sector greenhouse gas emissions data used in this calculation is sourced from NEM Review, *Greenhouse emissions*, as at 24 July 2018. The electricity generation data used in this calculation is described in the sources for Table 1.

2.2 Renewable energy development

Highlights

- Over the 2017-18 financial year, renewable energy sources accounted for approximately 18.3 per cent of Victoria's electricity generation.
- As at 30 June 2018, there were 12 new renewable energy projects under construction or undergoing the final stages of commissioning in Victoria. These projects are expected to add 1,707 MW to Victoria's renewable energy generation capacity.
- Victoria is **on track** to meet the 2020 VRET target. Victorian renewable energy generation capacity is expected to exceed the minimum generation capacity of **6,341 MW** required to achieve the 2020 target. As at 30 June 2018, there was 5,345 MW of installed renewable energy generation capacity in Victoria and 1,707 MW under construction or commissioning, a total of **7,052 MW**.

Renewable energy generation projects commissioned in 2017-18

In the 2017-18 financial year, Victoria's renewable energy capacity increased by 362 MW (Table 2). This growth was driven by the:

- commissioning of wind farms in Kiata, Maroona and Yaloak South;
- commissioning of the Swan Hill solar farm and stage 1 of the Gannawarra solar farm; and
- installation of 231 MW of rooftop solar panels by Victorian homes and businesses.

Table 2: Change in Victorian renewable electricity generation capacity in 2017-18

Project	Technology	Capacity (MW)	Location	Commissioning date
Kiata	Wind	31	10 km south east of Nhill	Dec-17
Maroona	Wind	7	18 km south west of Ararat	Mar-18
Yaloak South	Wind	29	14 km south of Ballan	May-18
Subtotal - wind		67		
Gannawarra Stage 1	Large-scale solar	50	Lalbert-Kerang Rd, Wandella	June-18
Swan Hill	Large-scale solar	14	Memorial Drive, Swan Hill	June-18
Rooftop PV (a)	Rooftop PV	231	State wide	Year round
Subtotal – solar		295		
Total		362		

Note: (a) includes both small-scale rooftop PV installations and commercial scale rooftop PV installations.

Sources: Information on the Kiata, Maroona, Yaloak South, Gannawarra and Swan Hill projects was obtained from public and private sources¹⁷. Small-scale rooftop PV capacity is sourced from CER, Small-scale postcode data¹⁸ while commercial scale rooftop PV capacity is sourced from CER, REC Registry of accredited power stations¹⁹.

¹⁷ See footnote 10 above. Note that some information on large-scale solar projects was also obtained from local councils.

¹⁸ See footnote 8 above.

Renewable energy generation projects under construction or undergoing commissioning

As at 30 June 2018, there were 1,707 MW of renewable energy projects under construction or undergoing the final stages of commissioning in Victoria (Table 3). This comprises nine wind farm projects with a combined capacity of around 1,441 MW and three solar farms with a combined capacity of around 266 MW.

Table 3: Victorian renewable energy projects under construction or commissioning as at 30 June 2018

Project	Technology	Capacity (MW)	Location	Estimated commissioning
Salt Creek	Wind	50	10 km north of Mortlake	Q3 2018
Bulgana	Wind	194	20 km north of Ararat	Q4 2019
Crowlands	Wind	79	20 km north east of Ararat	Q2 2019
Mount Gellibrand	Wind	132	25 km east of Colac	Q3 2018
Murra Warra Stage 1	Wind	226	25 km north of Horsham	Q3 2019
Timboon West	Wind	7	8 km north of Peterborough	Q4 2018
Lal Lal	Wind	216	25 km south of Ballarat	Q4 2019
Stockyard Hill	Wind	530	35 km west of Ballarat	Q1 2020
Yawong	Wind	7	15 km north east of St Arnaud	Q4 2018
Subtotal – wind		1,441		
Bannerton	Large-scale solar	88	Knight Rd & Wewak Rd, Bannerton	Q3 2018
Karadoc	Large-scale solar	90	Birkins Rd, Iraak	Q4 2018
Wemen	Large-scale solar	88	Booth Rd, Liparoo	Q1 2019
Subtotal – solar		266		
Total – wind and solar		1,707		

Note: Large-scale solar project capacities are reported in alternating current (AC) terms where available²⁰.

Sources: Information on all projects was obtained from public and private sources²¹.

Renewable energy generation capacity to 2020

Victoria is on track to meet the 2020 VRET target. Victorian renewable energy generation capacity is expected to exceed the minimum generation capacity of **6,341 MW** required to achieve the 2020 target.

As at 30 June 2018, there was 5,345 MW of installed renewable energy generation capacity in Victoria. This means that a further 996 MW of capacity is required to achieve the minimum generation capacity for 2020.

As at 30 June 2018, there was 1,707 MW of renewable energy generation capacity in Victoria under construction or in the final stages of commissioning, and expected to commence operation before 2020.

In total this is **7,052 MW** of renewable energy generation capacity in Victoria in operation or coming online before 2020.

¹⁹ See footnote 9 above.

²⁰ Most of the National Electricity Market grid transmits alternating current (AC) electricity. Electricity generated from solar panels is converted from direct current to AC before it is transmitted on the grid.

²¹ See footnote 10 above. Some information on large-scale solar projects was also obtained from local councils.

2.3 Investment and employment

Highlights

- Development of new renewable energy generation projects is expected to grow the sector in coming years and build upon the existing contribution of the renewables sector to the Victorian economy.
- **Completed renewable projects** (131 MW) in Victoria during the 2017-18 financial year involved around \$291 million in capital expenditure and around 663 jobs.
- **Renewable projects under construction** (1707 MW) in Victoria as of 30 June 2018 are expected to result in capital expenditure of \$3.36 billion and around 2,310 jobs.
- Projects in the above categories combined are expected to result in capital expenditure of more than \$3.6 billion and almost 3,000 jobs (to be realised over the next two years).

The installation and operation of renewable energy facilities attracts investment to the State, contributing to jobs and value add in the Victorian economy. The latest data from the Australian Bureau of Statistics (ABS) indicates that Victoria's renewable energy industry supported 2,190 direct full time equivalent jobs in Victoria in 2016-17²². Around 1,410 of these jobs were associated with Victoria's solar industry, which in 2016-17 predominantly involved the installation and maintenance of rooftop solar PV systems.

As estimates of economic activity and employment in Victoria's renewable energy industry for the 2017-18 financial year are not available from the ABS, this report draws entirely on project specific information. The report presents capital expenditure and direct jobs associated with the construction and operation of renewable energy generation facilities in Victoria during the 2017-18 financial year.

Investment and employment from large-scale renewable generation projects

Based on information available to DELWP²³, it is estimated that the large-scale renewable generation projects completed in Victoria during the financial year 2017-18 generated \$291 million in capital expenditure, 640 jobs in construction and at least 23 ongoing jobs (Table 4).

Jobs and investment figures associated with rooftop PV solar for the 2017-18 financial year were not available at the time of the preparation of this report.

Table 4: Estimated capital expenditure and jobs associated with Victorian large-scale renewable energy projects, commissioned in 2017-18

	Capacity (MW)	Capex (\$m)	Jobs
Wind	67	175	241
Solar	64	116	422
Total	131	291	663

Note: Large-scale solar project capacities are reported in alternating current (AC) terms where available.

²² ABS, 4631.0 – *Employment in renewable energy activities, Australia, 2016-17*, April 2018. Available at <http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4631.0Main+Features12016-17?OpenDocument>

²³ This information includes publicly available project information from websites and media articles, and information obtained by DELWP from project proponents. Note that renewable energy project jobs figures are reported here in the same terms as they were provided by the proponents. DELWP has not attempted to standardise this data in any way.

Source: Information sourced directly from project proponents and publicly available information from project websites and media articles.

Investment and employment from projects under construction or undergoing commissioning

A total of 1,707 MW of large-scale renewable electricity generation projects under construction or undergoing commissioning in Victoria as of 30 June 2018 is expected to result in capital expenditure of up to \$3.36 billion and around 2,310 jobs (Table 5).

Project information available to DELWP shows that around 95 per cent of large-scale renewable generation jobs are expected to occur in construction activities (over the life of the projects), while the remaining jobs are ongoing positions associated with operating the facilities once they have been commissioned.

Reflecting its large share of Victoria's renewable energy construction pipeline, wind farm projects under construction are expected to account for around \$2.88 billion in capital expenditure and 1,442 jobs (including both construction and ongoing jobs).

Table 5: Estimated capital expenditure and jobs associated with Victorian large-scale renewable energy projects under construction or undergoing commissioning as at 30 June 2018

	Capacity (MW)	Capex (\$m)	Jobs
Wind	1,441	2,875	1,442
Solar	266	483	868
Total	1,707	3,358	2,310

Note: Large-scale solar project capacities are reported in alternating current (AC) terms where available.

Source: Information sourced directly from project proponents and publicly available information from project websites and media articles.

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 from Ballarat and Horsham down to the coast have particularly good wind resources and have attracted much of the wind farm construction activity in Victoria to date (Table 6). As north western Victoria has higher levels of solar irradiation than most of the rest of Victoria, the Mallee region has attracted all the solar projects constructed in Victoria as at 30 June 2018.

Table 6: Overview of renewable energy construction activity in Victoria completed during 2017-18 (Table 4) or under construction as at 30 June 2018 (Table 5), by region²⁴

	Capacity (MW)		Capex (\$m)		Jobs	
	Wind	Solar	Wind	Solar	Wind	Solar
Central Highlands	1,055	0	2,187	0	1,021	0
Barwon and Great South Coast	189	0	383	0	377	0
Mallee	0	330	0	599	0	1,290
Wimmera Southern Mallee	264	0	480	0	285	0
Total	1,509	330	3,050	599	1,683	1,290

Note: Large-scale solar project capacities are reported in alternating current (AC) terms where available.

Source: Information sourced directly from project proponents and publicly available information from project websites and media articles.

²⁴ Regional definitions in this table are based on Regional Development Victoria classifications at: <https://www.rdv.vic.gov.au/victorian-regions>

2.4 Performance of schemes

The REJI Act requires the Minister to report on the performance of schemes to achieve targets under the Act that promote the generation of electricity by large scale facilities that utilise renewable energy sources or convert renewable energy sources into electricity.

The results of the VRET 2017 Reserve Auction (the Auction) – a scheme designed to support the achievement of the targets – were released in September 2018, outside the reporting period of this report. The performance of the Auction will be assessed and reported in the 2018-19 VRET Progress Report.

Since 2014, the Victorian Government has implemented a number of major initiatives to support the renewable energy industry, and our transition to a clean energy future, while maintaining system security and reliability.

The Renewable Certificate Purchasing Initiative (RCPI)

Under the RCPI initiative, the government purchases Large-scale Generation Certificates (LGCs) related to its electricity use directly from new Victorian projects. To date the initiative has brought forward investment in two wind farms²⁵ and two solar farms²⁶ totalling 351 MW and around \$533 million of investment. These projects are expected to generate around 600 jobs in regional Victoria during construction.

Around 35MW of the new solar farms will be linked to the entire Melbourne tram fleet through the Solar Trams initiative. The government will voluntarily surrender an LGCs volume matching the entire electricity demand of Melbourne's trams. The Solar Trams initiative will result in a reduction of more than 80,000 tonnes of greenhouse gas emissions every year.

Bulgana Green Power Hub project

The Victorian Government has entered into a 15-year Support Agreement with Neoen Australia to build a new wind farm with battery storage in Western Victoria. The facility will power the expansion of Stawell's Nectar Farms and will be known as the Bulgana Green Power Hub.

The wind farm and battery storage system will provide reliable and affordable renewable energy to unlock the development of a major new advanced agriculture facility in Stawell, with a total expected investment of \$665 million. The 194 MW Bulgana Green Power Hub will be backed up by a 20 MW battery, making the Nectar Farms expansion a reality by providing the secure and affordable energy that they need for their hydroponic greenhouses. However, this will require only 10 per cent of the wind farms total energy generating capacity. The remaining 90 per cent will go straight to the grid, improving energy supply and security for Victorians.

As an advanced, integrated renewable energy project, battery and agriculture facility, Bulgana project is world-leading. More than 1,300 jobs will be created, including 270 direct ongoing jobs in the agricultural sector and 10 direct ongoing jobs in the renewable energy industry – all located in the Stawell region.

Large-scale batteries – Modernising Victoria's energy grid

The Government has committed \$25 million to the deployment of two large scale batteries in Western Victoria with a combined capacity of 55 MW and 80 MWh. The batteries are a 30MW/30MWh system connected directly to a vital grid intersection at a substation at Warrenheip, near Ballarat, and a 25MW/50MWh Tesla battery behind-the-meter at the Gannawarra Solar Farm, south-west of Kerang. This second battery will be the largest integrated solar farm and battery in Australia and among the largest in the world.

²⁵ RCPI wind farms: Kiata Wind Farm (31 MW) and Mt Gellibrand Wind Farm (132 MW).

²⁶ RCPI solar farms: Bannerton Solar Park (88 MW) and Numurkah Solar Farm (100 MW).

The batteries, strategically located at known constrained parts of the electricity network, which will provide much-needed backup power and grid-stabilisation functions which are vital to maintaining a reliable and affordable energy supply for Victoria.

Construction at both projects is mostly complete with commissioning, in conjunction with the Australian Energy Market Operator (AEMO), commencing shortly. The batteries are on track to be ready by the summer of 2018/19.

Microgrid Demonstration Program

In 2017, the government announced that \$15.8 million of funding has been allocated towards a Microgrid Demonstration Program. In December, the Victorian Government announced the opening of the Expression of Interest stage for the program, with grants of between \$100,000 and \$5 million available to facilitate and implement state-wide microgrid demonstration projects in Victoria.

The government has begun announcing the successful projects, including:

- a \$980,000 grant towards the Ovida Community Energy Hub project. The \$2 million Ovida project will install shared solar PV and battery systems in three buildings in Melbourne to help cut energy costs for tenants. Ovida will work with Moreland Energy Foundation, RMIT University, Allume Energy and Jemena to deliver the project which will support affordable, dispatchable and reliable energy for occupants of apartment and commercial buildings.
- a \$4.5 million grant to help establish Victoria's largest virtual power plant. Origin Energy will develop a \$20 million cloud-based project that will distribute power from up to 650 customers with solar PV and batteries during peak periods. The Origin Energy Virtual Power Plant (VPP) will boost grid stability by discharging power from solar PV and batteries located at homes and commercial and industrial sites to reduce their power bills. The selected customers will receive discounted batteries, demonstrating opportunities for coordinating solar PV, batteries and flexible demand across Victoria.

3. Closing statement

The VRET 2017-18 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 particular focus on achievements recorded over the 2017-18 financial year.

Overall, the Victorian Government has increased market confidence not only by legislating targets, but also by delivering competitive renewable energy projects through the VRET 2017 Reverse Auction, while also attracting investment and jobs in the State.

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

Table 7: VRET 2017-18 Progress Report – synthesis of findings

Reporting requirements	Financial year 2017-18	Section with further detail
Progress made towards meeting the renewable energy targets	<p>Renewable energy generation accounted for 18.3 per cent of Victoria's electricity generation over the financial year.</p> <p>Victoria is on track to meet the 2020 VRET target. Victorian renewable energy generation capacity is expected to exceed the minimum generation capacity of 6,341 MW required to achieve the 2020 target. As at 30 June 2018, there was 5,345 MW of installed renewable energy generation capacity in Victoria and 1,707 MW under construction or commissioning, a total of 7,052 MW.</p>	Section 2.1
Investment and employment in Victoria in relation to renewable electricity generation	Victoria's operating small and large scale renewable energy capacity increased by around 362 MW.	Section 2.2
	<p>Victoria is developing a significant amount of large-scale renewable energy generation capacity as follows:</p> <ul style="list-style-type: none"> Commissioned projects amounting to 131 MW capacity from three wind farms and two solar farms. Projects under construction or in the final stages of commissioning have reached 1,707 MW from nine wind farms and three solar farms as at 30 June 2018. <p>Projects commissioned, under construction or in the final stages of commissioning are expected to result in capital expenditure of more than \$3.6 billion and almost 3,000 jobs (to be realised over the next two years).</p>	Section 2.3
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.	<p>The results of the Auction were released in the 2018-19 financial year. The performance of the Auction will be assessed and reported in the next VRET Progress Report.</p> <p>The report provides an outline of several major initiatives introduced by the Victorian Government to support the renewable energy industry.</p>	Section 2.4

