

# Victoria's Renewable Energy Targets

2023/24 Progress Report



## Photo credit

Victorian Big Battery. Photo credit Neoen

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.

DEECA is committed to genuinely partnering with Victorian Traditional Owners and Victoria's Aboriginal community to progress their aspirations.



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## Minister's foreword



I am pleased to report that the 2023/24 financial year has seen Victoria make strong progress towards delivering an affordable, reliable and secure energy transition. Specifically, eleven energy storage projects with a combined capacity of 1.1 gigawatts (GW) commenced construction during the year, while 13 large-scale wind and solar projects with a combined capacity of 2.2 GW were under construction or in commissioning as at 30 June 2024. I am also pleased to be extending this report's coverage this year to include Victoria's energy storage and offshore wind targets, following their legislation during 2023/24.

Our key achievements to drive Victoria's renewable energy transition this year included:

- Legislating Victoria's renewable energy targets (VRET) of 65 per cent renewable generation by 2030 and 95 per cent by 2035; our energy storage targets of at least 2.6 GW of energy storage capacity by 2030 and at least 6.3 GW by 2035; and our offshore wind targets of at least 2 GW of offshore wind capacity by 2032, 4 GW by 2035 and 9 GW by 2040;
- Releasing the third of our cross-portfolio Offshore Wind Energy Implementation Statements to guide industry, stakeholders and the community;
- Accelerating planning approvals for renewable energy projects, by making them eligible for an accelerated planning pathway under the Development Facilitation Program;
- Working with the Commonwealth to secure a minimum allocation of 1.4 GW of renewable energy capacity for Victoria in the Commonwealth's national Capacity Investment Scheme (CIS) tender in May 2024;
- Announcing six projects, comprising 25 batteries, to be delivered under the first round of the 100 Neighbourhood Batteries Program; and
- Continuing with the roll-out of our nation-leading Solar Homes Program, which during 2023/24 supported more than 45,300 Victorians to install new rooftop PV with a capacity of 359 MW.

The Solar Homes program is expected to generate 11.8 per cent of Victoria's 40 per cent renewable energy target by 2025 and 9.5 per cent of the 2030 target of 65 per cent renewable generation. By 2027/28, the Solar Homes program is expected to reduce Victorian electricity sector emissions by around 0.74 million tonnes of carbon dioxide equivalent (Mt CO<sub>2</sub>e) and reduce National Electricity Market (NEM) emissions as a whole by around 1.3 Mt CO<sub>2</sub>e.

During 2023/24 renewable sources generated 37.8 per cent of Victoria's electricity, slightly below the 38.0 per cent renewable generation recorded in 2022/23, due to low wind conditions in the second quarter of 2024 and reduced hydroelectricity generation. It is estimated that Victoria would have reached around 38.8 per cent renewable electricity generation in 2023/24 had normal wind conditions prevailed in the second quarter of 2024. The low wind conditions in the second quarter of 2024 were temporary and Victoria's wind generation reached record levels in the third quarter of 2024. Victoria's renewable generation in 2023/24, combined with Victoria's strong pipeline of renewable energy projects, has Victoria well placed to achieve its VRET 2025 target of 40 per cent. In relation to energy storage, Victoria's 557 MW of energy storage capacity as at 30 June 2024 and substantial storage construction activity has Victoria tracking well towards its 2030 energy storage target of at least 2.6 GW. Overall, large-scale renewable energy and energy storage projects in development during 2023/24 are estimated to have resulted in capital expenditure of \$2,517 million and 1,274 jobs in Victoria during the year.

Please join me in celebrating the achievements of our renewable energy and energy storage sectors in 2023/24. Our Government will continue to work with the community, stakeholders and industry to lead the energy transition and ensure a bright energy future for Victoria.

# 1. Background

## 1.1 About this report

Victoria's *Renewable Energy (Jobs and Investment) Act 2017* (REJI Act) was amended in March 2024 to legislate

- Victoria's renewable energy targets (VRET) of 65 per cent by 2030 and 95 per cent by 2035;
- Victoria's energy storage targets of at least 2.6 gigawatts (GW) of energy storage capacity by 2030 and at least 6.3 GW by 2035; and
- Victoria's offshore wind targets of at least 2 GW of offshore wind generation capacity by 2032, 4 GW by 2035 and 9 GW by 2040.

Section 8 of the REJI Act now requires the Minister for Energy and Resources (the Minister) to report to the Parliament for each financial year on:

- the progress made towards meeting the renewable energy, energy storage and offshore wind targets;
- investment and employment in Victoria in relation to renewable electricity generation, including in the offshore area of Victoria, and energy storage; and
- the performance of schemes to achieve Victoria's renewable energy, energy storage and offshore wind targets under the REJI Act.

This report presents an assessment of progress towards these targets and state-wide investment and employment in Victoria in relation to renewable energy generation and energy storage. The reporting period for this report is the 2023/24 financial year. The assessments against Victoria's energy storage and offshore wind targets are new features of the report this year, following the legislation of these targets during the year.

The Department of Energy, Environment, and Climate Action (DEECA) has based this report on the latest publicly available information from sources including the Australian Energy Market Operator (AEMO), the Clean Energy Regulator (CER), project information received from renewable energy and energy storage project developers and data from Solar Victoria.

## 1.2 Victoria's renewable energy and energy storage targets and Victoria's renewable energy and energy storage sectors

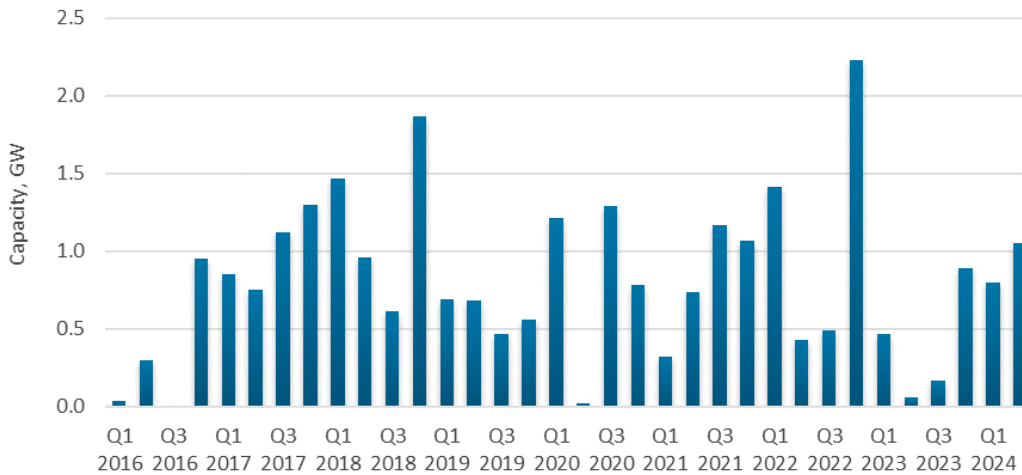
The Victorian Government legislated the VRET in 2017 to provide greater policy certainty and investor confidence for the renewable energy industry in Victoria. The REJI Act and Victorian Government initiatives in support of the targets have been important drivers of the development of renewable energy projects in Victoria in recent years<sup>1</sup> (Figure 1). The first VRET auction, announced in September 2018, supported investment in five new Victorian wind and solar projects with a combined capacity of 800 megawatts (MW), while the second VRET auction, announced in October 2022, supported six large-scale solar projects with a combined 623 MW of new renewable generation capacity and 365 MW and 600 megawatt-hours (MWh) of new battery energy storage when operational<sup>2</sup>. These projects include the 102 MW Glenrowan Solar Farm, which commenced construction in March 2023 and was commissioned in the second quarter of 2024.

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<sup>1</sup> See <https://www.energy.vic.gov.au/renewable-energy/victorian-renewable-energy-and-storage-targets/victorian-renewable-energy-target-auction-vret1>

<sup>2</sup> New Solar Farms Powering Victoria, 7 October 2022. See <https://www.premier.vic.gov.au/new-solar-farms-powering-victoria>

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

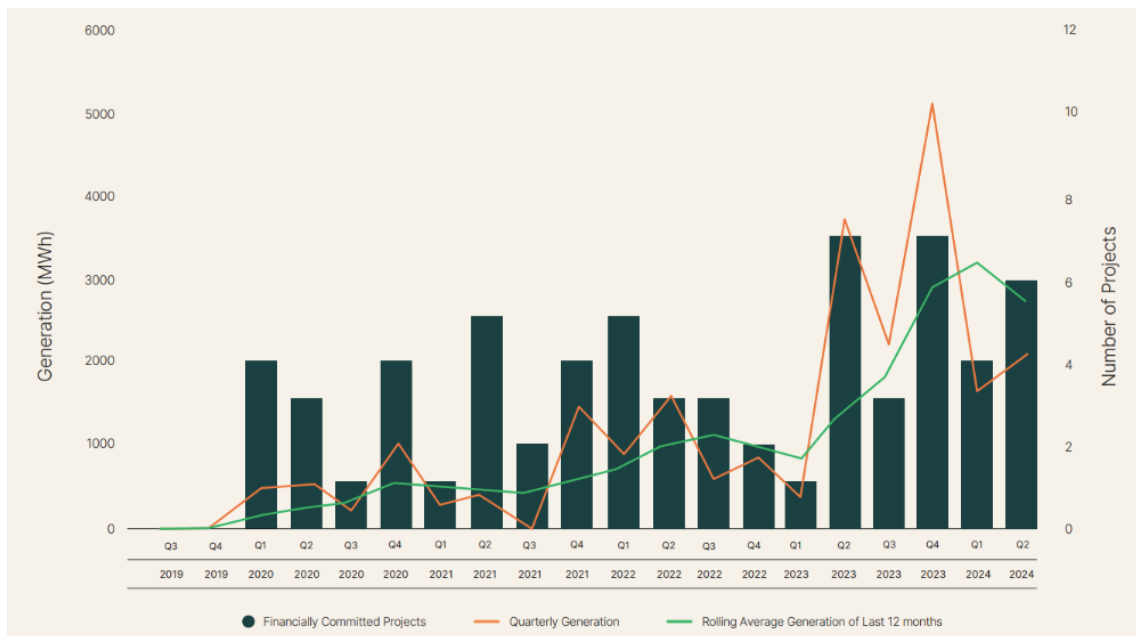


Source: Clean Energy Regulator, Quarterly Carbon Market Report June Quarter 2024

In 2022, building on this success and recognising the accelerating nature and increasing complexity of Victoria’s renewable energy transition, the Victorian Government committed to an increased VRET 2030 target of 65 per cent renewable electricity generation, a new 2035 target of 95 per cent, as well as setting energy storage targets of at least 2.6 GW of storage capacity by 2030 and at least 6.3 GW by 2035. Since then, the Government has progressed a whole-of-system program of initiatives and actions, including legislating these targets and offshore wind targets, to support the transition of Victoria’s energy system.

Key milestones achieved in relation to our energy storage targets in 2023/24 include the commencement of construction at the SEC’s 600 MW/1600 MWh Melbourne Renewable Energy Hub and at the 185 MW/365 MWh Koorangie Energy Storage System, supported under the Victorian Government’s Renewable Energy Zones Development Fund.

**Figure 2: Energy storage capacity committed by quarter in Australia since 2019, MWh**



Source: Clean Energy Council, Renewable projects quarterly report Q2 2024

In relation to our offshore wind targets, 2023/24 saw Victoria continue our national leadership of offshore wind development with the release of Offshore Wind Energy Implementation Statement 3 to guide industry, stakeholders and the community on the progress of Australia’s first offshore wind industry.

## 2. Progress towards Victoria’s renewable energy and energy storage targets

### Highlights

- Over the 2023/24 financial year, renewable energy sources accounted for approximately **37.8 per cent** of Victoria’s electricity generation. As at 30 June 2024, there were 13 renewable energy generation projects under construction or undergoing commissioning in Victoria, with a combined capacity of 2,199 MW.
- Over 2023/24, Victorian households and businesses installed 630 MW of rooftop solar systems, which saw rooftop solar provide 9.3 per cent of Victoria’s electricity generation in 2023/24, up from 7.9 per cent in 2022/23.
- This 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 2025 target of **40 per cent** renewable electricity generation.
- As at 30 June 2024, Victoria had **557 MW** of commissioned energy storage capacity and twelve utility-scale storage projects with a combined capacity of **1,115 MW** under construction or undergoing commissioning. This strong storage project pipeline will contribute to Victoria’s 2030 energy storage target of **at least 2.6 GW**.

### 2.1 Victoria’s current electricity generation profile

#### Renewable energy generation

In the 2023/24 financial year, Victoria generated around 20,545 gigawatt hours (GWh) of electricity from VRET eligible renewable energy sources (Table 1). This renewable electricity generation accounted for around 37.8 per cent of the 54,325 GWh of electricity generated in Victoria in 2023/24 from all sources<sup>3</sup>. The major contributors to renewable generation in Victoria over the 2023/24 financial year were wind generation (about 19.2 per cent), solar power including both large-scale solar and rooftop PV (12.9 per cent) and hydroelectricity (4.8 per cent).

Table 1: Victorian electricity generation by source, 2023/24 financial year

Source	GWh	Share (%)
Brown coal	32,183	59.2
Gas	1,404	2.6
Renewable energy		
- Wind	10,456	19.2
- Solar (rooftop PV)	5,054	9.3
- Hydroelectricity	2,590	4.8
- Solar (large scale)	1,961	3.6
- Bioenergy (renewable energy sources eligible under VRET) <sup>4</sup>	485	0.9
Other (renewable energy sources non-eligible under VRET)	193	0.4

<sup>3</sup> The share of renewable generation from all sources (VRET eligible and ineligible) in 2023/24 was 38.2 per cent of Victoria’s total electricity generation.

<sup>4</sup> 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.

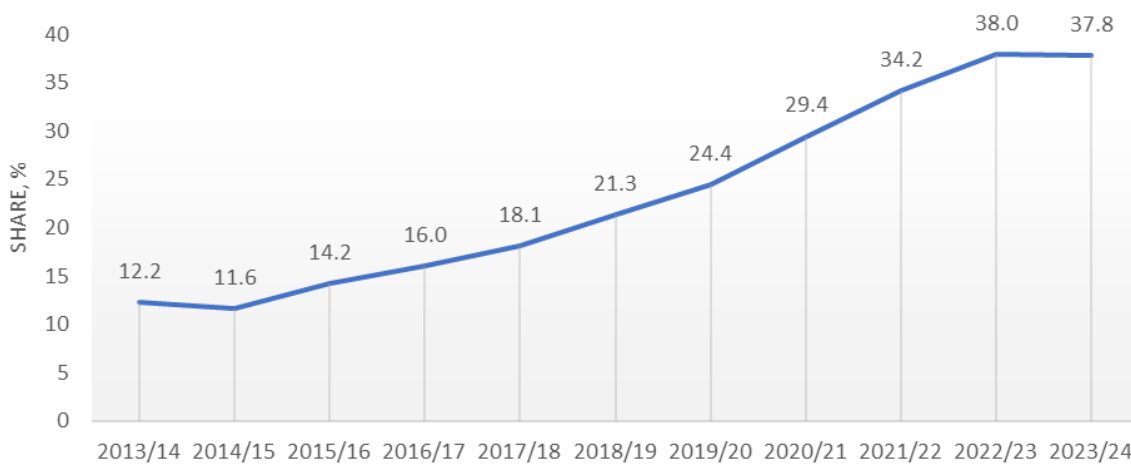


Source	GWh	Share (%)
Total eligible renewable energy	20,545	37.8
Total all renewable energy	20,737	38.2
Total energy	54,325	100.0

Source: Refer to Figure 2 below for sources. Note: Totals may not sum due to rounding.

The share of renewable energy in Victoria's electricity generation has increased significantly over the last decade, from 11.6 per cent in 2014/15 to 37.8 per cent over the 2023/24 financial year (Figure 2). The slight reduction in Victoria's renewable electricity generation share between 2022/23 and 2023/24 reflects low wind conditions in the June quarter of 2024 and reduced hydroelectricity generation relative to 2022/23<sup>5</sup>. It is estimated that the low wind conditions in the second quarter of 2024 reduced Victoria's wind generation in the quarter by around 0.9 terawatt hours relative to what would have occurred under normal conditions and that Victoria would have reached around 38.8 per cent renewable electricity generation in 2023/24 had normal wind conditions prevailed in the second quarter of 2024.

**Figure 2: Victorian renewable electricity generation share, 2013/14 to 2023/24**



Source: NEM Review, Metered generation (as generated), up to 2021/22, extracted on 5 July 2022 and NEOpint, Generation thereafter, extracted on 17 September 2024,<sup>6</sup> except for bioenergy (based on Australian Government Department of Climate Change, Energy, the Environment and Water, Australian Energy Statistics)<sup>7</sup> and some small generators (based on Departmental estimates)<sup>8</sup>.

The Solar Homes Program contributed around 3.7 per cent of Victoria's electricity generation in 2023/24, which is estimated at around 8.9 per cent of the renewable electricity needed to meet Victoria's 2025 renewable energy target of 40 per cent renewable generation<sup>9</sup>.

The increase in Victoria's renewable electricity generation over the last decade has come from new wind and solar farms and the installation of rooftop PV systems across the state. The installation of rooftop PV

<sup>5</sup> See AEMO, Quarterly Energy Dynamics Q2 2024, p. 23. <https://aemo.com.au/-/media/files/major-publications/qed/2024/qed-q2-2024.pdf?la=en&hash=396D7F26218A2AD5EB62FABBB5C9411C>

<sup>6</sup> NEM Review and NEOpint are subscription based Australian energy data services prepared by Global Roam and Intelligent Energy Systems respectively. Both NEM Review and NEOpint's electricity 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 and NEOpint data captures the vast majority of Victorian electricity generation with some exceptions – see footnotes 7 and 8, below.

<sup>7</sup> NEM Review and NEOpint do 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 2022/23 and 2023. Note that this update did not include data for 2023/24 so data from 2022/23 was used as a proxy for 2023/24.

<sup>8</sup> 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), Coonoor 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), Girgarre 1 and 2 (5 MW each), Echuca (5 MW), Stanhope 1, 2, 3, 4 and 5 (5 MW each), Katamatite (5 MW), Numurkah 1 and 2 (5 MW each), Robinvale (7.4 MW), Longford (29.6 MW), Qenos (21 MW), Wunghnu (5 MW), Melbourne Airport (12 MW), Ferguson (12 MW), Waurin Ponds Smart Energy Project (7 MW), Yarroweyah (5 MW), Bamawm (5 MW), Pine Lodge (5 MW), and Tatura (5 MW), Carwarp (4 MW), Melbourne Water – Winneke (6 MW) and Eastern (19 MW), Raywood (5 MW), Ledcourt (5 MW), Goornong (5 MW), Moolort (5 MW) and Cosgrove (5 MW) – are not reported by NEM Review or NEOpint. Annual output of these generators is estimated by the Department.

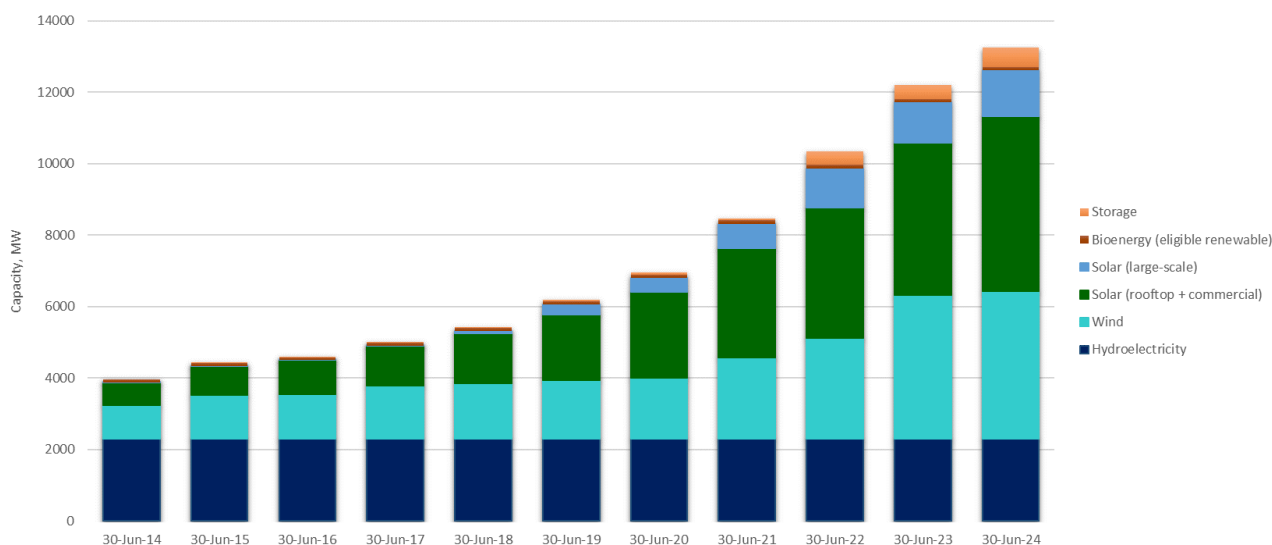
<sup>9</sup> These estimates are based on current program uptake data from Solar Victoria at the time of writing in September 2024.

systems has been supported by the Solar Homes Program since 2018. The Solar Homes Program is currently expected to generate 11.8 per cent of the renewable electricity needed to meet Victoria's 40 per cent renewable energy target by 2025 and 9.5 per cent of the increased VRET 2030 target of 65 per cent renewable generation<sup>10</sup>.

### Installed renewable energy generation and energy storage capacity

As of 30 June 2024, Victoria had 12,711 MW of installed capacity from all sources of renewable energy eligible to contribute to Victoria's renewable energy targets – hydroelectricity, wind, solar (including large-scale, commercial and rooftop PV) and bioenergy excluding native forest wood waste<sup>11</sup> (Figure 3). This compares to 11,823 MW of installed capacity at 30 June 2023<sup>12</sup>. At 30 June 2024, Victoria also had 557 MW of installed energy storage capacity that will contribute to Victoria's energy storage targets<sup>13</sup>. This capacity includes 537 MW of commissioned utility-scale storage and 19 MW of distributed energy batteries able to contribute to Victoria's electricity grid through aggregation arrangements with Virtual Power Plant (VPP) providers.

**Figure 3: Victorian renewable electricity generation and storage capacity, 2013/14 to 2023/24**



Source: Based on AEMO, Generation information for Victoria<sup>14</sup>; CER, Small-scale postcode data<sup>15</sup> and CER data on approved power stations<sup>16</sup> and other generation project information<sup>17</sup>.

<sup>10</sup> Based on internal analysis conducted by the Department of Energy, Environment and Climate Action. These estimates reflect current program information and should not be interpreted as statements of performance against Solar Homes program targets. These estimates are lower than those reported in last year's VRET Progress Report 2022/23 (which estimated 13.4 per cent of the VRET 2025 target and 15.3 per cent of the VRET 2030 target). These reductions reflect a reduction in the expected number of rebates to be delivered under the program through to 2027/28, and updated energy market modelling in 2024 which projected higher future electricity generation volumes than the previous energy market modelling used for this purpose.

<sup>11</sup> See footnote 4.

<sup>12</sup> The 2022/23 VRET Progress Report reported a total installed renewable energy capacity of 11,745 MW, which was derived from the most up to date information at the time of publishing. This capacity has been updated for the 2023/24 VRET Progress Report with the most recent data for 2022/23 from AEMO Generation Information and the CER small-scale postcode data for solar installations (see footnotes 14, 15 and 16). This change reflects updated rooftop PV and accredited power station data from the CER.

<sup>13</sup> Victoria's energy storage targets include energy storage facilities connected to a transmission or distribution system that have the capacity to store and dispatch electricity. This includes utility-scale and commercial-scale facilities and also household energy batteries that participate in Virtual Power Plant (VPP) arrangements managed by VPP aggregators.

<sup>14</sup> 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, 7 July 2021, 22 July 2022, 13 July 2023 and 27 May 2024 were used in developing this data. See <https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/forecasting-and-planning-data/generation-information>

<sup>15</sup> CER small-scale postcode data for solar installations is available at <https://cer.gov.au/markets/reports-and-data/small-scale-installation-postcode-data>

<sup>16</sup> The CER's data on approved power stations up to the end of 2023 is available at <https://cer.gov.au/markets/reports-and-data/large-scale-renewable-energy-data/historical-large-scale-renewable-energy-supply-data>. The CER's data on approved power stations in 2024 is available at <https://cer.gov.au/markets/reports-and-data/large-scale-renewable-energy-data>

<sup>17</sup> This information includes publicly available information from project websites and media releases and information that DEECA has obtained directly from project proponents.

In 2023/24, Solar Victoria’s Solar Homes Program supported 45,300 new rooftop PV installations in Victoria (for both owner-occupier households and rental providers), with an estimated capacity of 359 MW of rooftop PV installed. From its commencement to the end of June 2024, the Solar Homes Program has supported 1,928 MW of rooftop PV systems in Victoria<sup>18</sup>. Additionally, in 2023/24, the Solar for Business program supported 635 small and mid-sized Victorian businesses to install a further 10 MW of capacity.

Victoria’s commissioned renewable energy capacity increased by 8,746 MW between the end of June 2014 and the end of June 2024. This is overwhelmingly driven by the commissioning of large-scale wind and solar farms and the installation of rooftop solar PV systems. Over this period, rooftop PV capacity increased by 4,269 MW, wind capacity increased by 3,180 MW, large-scale solar capacity increased by 1,287 MW and bioenergy capacity increased by 10 MW.

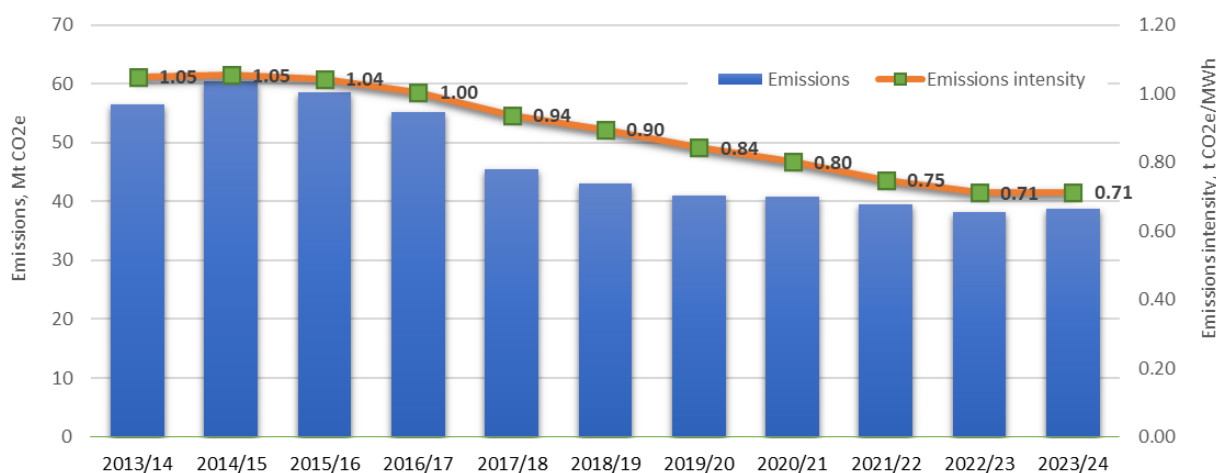
All of Victoria’s energy storage capacity has been introduced since 30 June 2014.

### Emissions reduction

Victoria’s electricity sector greenhouse gas emissions have fallen from around 60.3 million tonnes (Mt) of CO<sub>2</sub>-e in 2014/15 to around 38.7 Mt of CO<sub>2</sub>-e in 2023/24 (Figure 4). This decline was associated with the reduction in coal fired electricity generation (mostly contributed by the retirement of the Hazelwood Power Station in March 2017) and the growth of renewable electricity generation (which allows for the displacement of coal capacity) in Victoria over this period.

In 2023/24, the Solar Homes Program is estimated to have reduced emissions in the National Electricity Market by 0.64 Mt of CO<sub>2</sub>e 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 0.74 and 1.3 Mt of CO<sub>2</sub>e respectively below what they would otherwise have been<sup>19</sup>.

**Figure 4: Emissions from electricity generation in Victoria, 2013/14 to 2023/24**



Source: Data to 2022/23 from Clean Energy Regulator, Electricity sector emissions and generation data, various years. Data for 2023/24 estimated based on emissions intensities from 2022/23 Clean Energy Regulator data and 2023/24 electricity generation data from NEOpoint.

## 2.2 Renewable energy and energy storage development

### Renewable energy generation and energy storage projects commissioned in 2023/24

In the 2023/24 financial year, Victoria’s commissioned large and small-scale renewable energy capacity increased by 888 MW (Table 2). Victoria’s commissioned energy storage capacity increased by 153 MW in 2023/24 with the commissioning of projects at Hazelwood and Carwarp. This growth was driven by the:

- Commissioning of the Berrybank (stage 2) wind farm.

<sup>18</sup> Based on Solar Victoria program tracking.

<sup>19</sup> The estimated emissions impacts for the Solar Homes program are lower than the impacts reported in last year’s VRET Progress Report 2022/23 (which estimated a 1.9 Mt CO<sub>2</sub>e reduction in Victoria and a 3.1 Mt CO<sub>2</sub>e reduction NEM wide by 2027/28). This reduction primarily reflects updated energy market modelling in 2024 which estimated lower net emissions abatement factors for Victorian rooftop PV generation than the previous energy market modelling used for this purpose. The reduction also reflects a reduction in the expected number of rebates to be delivered under the program through to 2027/28.

- Commissioning of the Glenrowan, Cosgrove, Goornong, Ledcourt, Moolort, Raywood and Melbourne Water (BTM) – Eastern solar farms.
- Commission of the Hazelwood battery energy storage system.
- Commissioning of Raygen’s solar thermal power plant at Carwarp comprising a 4 MW solar farm and 2.8 MW / 50 MWh thermal energy storage system.
- Installation of 630 MW of rooftop solar panels by Victorian homes and businesses.

**Table 2: Change in Victorian renewable electricity generation and energy storage capacity in 2023/24**

Project	Technology	Capacity (MW)	Location	Commissioned
Berrybank (stage 2)	Wind	109	60 km south west of Ballarat	Q3 2023
<b>Subtotal – wind</b>		<b>109</b>		
Cosgrove	Large-scale solar	5	Cosgrove-Caniambo Rd, Greater Shepparton	Q2 2024
Glenrowan	Large-scale solar	102	Glenrowan West Rd, Glenrowan	Q2 2024
Goornong	Large-scale solar	5	Midland Hwy, Goornong	Q1 2024
Ledcourt	Large-scale solar	5	Western Hwy, Ledcourt	Q1 2024
Melbourne Water (BTM) – Eastern	Large-scale solar	19	Bangholme, Melbourne	Q3 2023
Moolort	Large-scale solar	5	Pyrenees Hwy, Moolort	Q1 2024
Raygen Carwarp (solar farm) (a)	Large-scale solar	4	South West Angle Rd, Carwarp	Q3 2023
Raywood	Large-scale solar	5	McQualters Rd, Raywood	Q1 2024
Rooftop PV (b)	Rooftop PV	630	State wide	Year round
<b>Subtotal – solar</b>		<b>780</b>		
<b>Subtotal – hydroelectricity (c)</b>		<b>2</b>		
<b>Subtotal – bioenergy (d)</b>		<b>-3</b>		
<b>Total – renewable energy</b>		<b>888</b>		
Hazelwood BESS	Battery	150	Brodribb Rd, Hazelwood	Q4 2023
Raygen Carwarp (storage) (a)	Thermal storage	3	South West Angle Rd, Carwarp	Q3 2023
<b>Total – energy storage</b>		<b>153</b>		

Note: (a) Raygen Carwarp solar and storage plant is a single project with 3 MW connection. (b) includes both small-scale rooftop PV installations and commercial scale rooftop PV installations<sup>20</sup>. (c) reflects CER approval of Preston mini-hydro generation. (d) reflects Retirement of Brooklyn landfill gas facility and suspension of Australian Tartaric Products biomass facility. \* “BTM” refers to behind-the-meter solar generation. Totals may not sum due to rounding. Sources: Information on the large-scale projects was obtained from public and private sources<sup>21</sup>. Small-scale rooftop PV capacity is sourced from CER, Small-scale postcode data<sup>22</sup> while commercial scale rooftop PV capacity is sourced from CER data on approved power stations<sup>23</sup>.

### Renewable energy and energy storage projects under construction or undergoing commissioning

As at 30 June 2024, there were 2,199 MW of renewable electricity generation and 1,115 MW of energy storage projects under construction or undergoing commissioning in Victoria (Table 3). This comprises six wind farms projects with a combined capacity of around 1,967 MW, seven solar farms with a capacity of 232 MW and twelve energy storage systems with a capacity of 1,115 MW.

**Table 3: Victorian renewable energy and energy storage projects under construction or in commissioning as at 30 June 2024**

Project	Technology	Capacity (MW)	Location	Estimated commissioning
Golden Plains (stage 1)	Wind	756	60 km north west of Geelong	By Q3 2025
Golden Plains (stage 2)	Wind	577	60 km north west of Geelong	By Q1 2027
Hawkesdale	Wind	109	35 km north of Port Fairy	Q3 2024

<sup>20</sup> Commercial scale systems include rooftop and behind-the-meter solar systems exceeding 100 kW in capacity.

<sup>21</sup> See footnotes 14 and 17 above.

<sup>22</sup> See footnote 15 above.

<sup>23</sup> See footnote 16 above.

Project	Technology	Capacity (MW)	Location	Estimated commissioning
Mortlake South	Wind	158	5 km south of Mortlake	Q3 2024
Mt Gellibrand	Wind	132	25 km east of Colac	Q4 2024
Ryan Corner	Wind	235	10 km north of Port Fairy	Q4 2024
<b>Subtotal – wind</b>		<b>1,967</b>		
Bostocks Creek	Large-scale solar	5	Camperdown-Cobden Rd, Bostocks Creek	Q4 2024
Girgarre	Large-scale solar	94	Hendersons Rd and Masons Rd, Girgarre	Q1 2025
Mokoan 1 and 2	Large-scale solar	46	Lee Rd and Leson Rd, Winton	Q4 2025
Newstead (solar farm) (a)	Large-scale solar component	3	Pyrenees Hwy, Newstead	Q3 2024
Nhill (solar farm) (a)	Large-scale solar component	5	Nhill-Harrow Rd, Nhill	Q1 2025
Stawell	Large-scale solar	5	Dane Rd, Stawell	Q4 2024
Wunghnu	Large-scale solar	75	Kaarnimba Rd, Wunghnu	Q4 2024
<b>Subtotal – solar</b>		<b>232</b>		
<b>Total – renewable energy</b>		<b>2,199</b>		
Camperdown	Battery	4.8	Princes Hwy, Camperdown	Q2 2025
City of Melbourne – CH1	Battery	0.2	Little Collins St, Melbourne	Q4 2024
Koorangie	Battery	185	Lalbert-Kerang Rd, Kerang	Q1 2025
Latrobe Valley (stage 1)	Battery	100	Monash Way, Morwell	Q3 2025
Melbourne Renewable Energy Hub (stage 1)	Battery	600	Holden Rd, Plumpton	Q4 2025
Newstead (battery) (a)	Battery	3	Pyrenees Hwy, Newstead	Q3 2024
Nhill (battery) (a)	Battery	2.8	Nhill-Harrow Rd, Nhill	Q1 2025
Rangebank	Battery	200	Evans Rd, Cranbourne	Q4 2024
Tongala	Battery	4.8	Sinclair Rd, Tongala	Q2 2025
Warrnambool	Battery	4.8	Caramut Rd, Warrnambool	Q2 2025
Winchelsea	Battery	4.8	Inverleigh-Winchelsea Rd, Winchelsea	Q2 2025
Wyuna	Battery	4.8	Mcewen Rd, Wyuna	Q2 2025
<b>Total – storage</b>		<b>1,115</b>		

Note: (a) The Newstead Community Energy Project and Nhill Renewable Energy Hub are combined solar and battery storage projects. \* “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 27 May 2024<sup>24</sup>. Sources: Information on all projects was obtained from public and private sources<sup>25</sup>.

## 2.3 Development of Victoria’s offshore wind sector

Victoria’s offshore wind sector is in its formative stages, with foundational policy and planning work to support the sector’s development being undertaken by both the Victorian and Commonwealth Governments. Twelve projects are at the feasibility study stage and yet to commence construction.

Key achievements in the development of Victoria’s offshore wind sector during 2023/24 included:

- The Victorian Government’s release of Offshore Wind Energy Implementation Statement 3 in December 2023 to guide industry, stakeholders and the community on the progress of Victoria’s offshore wind industry<sup>26</sup>

<sup>24</sup> 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, nameplate capacities from AEMO’s Generation Information spreadsheet dated 27 May 2024 have been used where available. See <https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/Generation-information>.

<sup>25</sup> See footnotes 14 and 17 above.

<sup>26</sup> See <https://www.premier.vic.gov.au/emerging-offshore-wind-energy-sector-enters-next-phase>

- Victoria was admitted to the Global Offshore Wind Alliance as the organisation's first sub-National member in August 2023<sup>27</sup>;
- The Commonwealth Government awarded feasibility licences to six Victorian offshore wind projects looking to develop off the Gippsland coast in May 2024<sup>28</sup>. A further six feasibility licences were granted to Victorian projects by the Commonwealth in July 2024<sup>29</sup>.

## 2.4 Investment and employment

### Highlights

- Large-scale renewable generation projects in development (2,458 MW) in Victoria over the 2023/24 financial year are estimated to support around \$1,601 million in capital expenditure and around 1,063 jobs in the 2023/24 financial year.
- Large-scale energy storage projects in development (1,268 MW) in Victoria over the 2023/24 financial year are estimated to support around \$916 million in capital expenditure and around 212 jobs in the 2023/24 financial year.
- Over the whole period from project commencement to completion, these renewable energy and energy storage projects are estimated to support \$8.41 billion in capital expenditure and 3,882 jobs.
- In addition to the jobs supported through the construction of large-scale renewable energy projects, rooftop solar PV installations completed in 2023/24 are estimated to have supported a further 2,641 jobs.

The installation and operation of renewable electricity generation and energy storage facilities attracts investment to the State, contributing to jobs growth and economic activity across Victoria. This section of the report discusses the investment and employment outcomes for Victoria's renewable energy and energy storage sector in 2023/24.

Investment and employment from large-scale renewable energy and energy storage projects commissioned or under construction in Victoria during 2023/24 are based primarily on information provided to DEECA by renewable energy and energy storage project proponents. Victoria's small-scale solar industry is also an important driver of jobs and investment in Victoria. DEECA estimates that Victoria's rooftop solar PV industry supported approximately 2,641 jobs in 2023/24<sup>30</sup>.

### Investment and employment from large-scale renewable energy and energy storage projects

Based on information available to DECCA<sup>31</sup>, it is estimated that the large-scale renewable generation projects in development in Victoria during the financial year 2023/24 generated around \$1,601 million in capital expenditure and 1,063 jobs over the 2023/24 financial year (Table 4)<sup>32</sup>. Energy storage projects in development in Victoria during 2023/24 are estimated to have generated around \$916 million in capital expenditure and 212 jobs over the 2023/24 financial year.

Over the whole period from project commencement to completion, these renewable energy and energy storage projects are estimated to support \$8.41 billion in capital expenditure and 3,882 jobs. Projects in development

<sup>27</sup> See <https://gwec.net/global-offshore-wind-alliance-welcomes-state-of-victoria-as-first-sub-national-member/>

<sup>28</sup> See <https://www.dcceew.gov.au/about/news/first-round-offshore-feasibility-licenses-granted>

<sup>29</sup> See <https://www.dcceew.gov.au/energy/renewable/offshore-wind/areas/gippsland>

<sup>30</sup> Based on data from the Clean Energy Regulator and the employment multiplier for rooftop PV reported in Rutovitz, J., et al. (2024) *The Australian Electricity Workforce for the 2024 Integrated System Plan: Projections to 2050*. Prepared for RACE for 2030. This multiplier includes 'direct' jobs from renewable energy project development but excludes 'indirect' jobs in related industries and jobs 'induced' through expenditure of wages and salaries.

<sup>31</sup> This information includes publicly available project information from websites and media articles, and information obtained by DEECA 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.

<sup>32</sup> Construction jobs for 2023/24 have been estimated by apportioning the construction jobs figure reported by project proponents by the number of months in 2023/24 that the project was under construction relative to the project's total construction period. Operational jobs for 2023/24 have been estimated by apportioning the operational jobs figure reported by project proponents by the number of months in 2023/24 that the project was generating. DEECA notes that jobs figures are difficult to define and that this approach is an approximation.

during 2023/24 include projects that were commissioned during 2023/24 or were under construction or undergoing commissioning as of 30 June 2024.

**Table 4: Estimated capital expenditure and jobs associated with Victorian large-scale renewable energy and energy storage projects in development in 2023/24**

	Capacity (MW)	Capex (\$m)		Jobs	
		In 2023/24	Over project life	In 2023/24	Over project life
Wind	2,076	1,189	5,556	722	2,590
Solar	382	412	791	341	738
Storage	1,268	916	2,068	212	554
<b>Total</b>	<b>3,726</b>	<b>2,517</b>	<b>8,415</b>	<b>1,274</b>	<b>3,882</b>

Source: Information sourced directly from project proponents and publicly available information from project websites and media articles. Note the capex and jobs figures for 2023/24 are an estimate of the proportion of the total capex and jobs from project commencement to completion that occurred in the 2023/24 financial year. Totals may not sum due to rounding.

Wind farm projects in development during 2023/24 are expected to account for around \$1,189 million in capital expenditure and 722 jobs over 2023/24, while solar projects in development during 2023/24 are expected to account for around \$412 million in capital expenditure and 341 jobs in 2023/24.

As Victoria's offshore wind projects are yet to commence construction, investment and employment in Victoria's offshore wind sector in financial year 2023/24 is limited to establishment activities for developers and is difficult to estimate. Employment in Victoria's offshore wind sector is expected to peak with project construction activity in the mid-2030s. At this time, the sector is estimated to require up to 2,300 – 4,000 jobs across Australia with most of these jobs in Victoria<sup>33</sup>.

### Investment and employment by region in 2023/24

The distribution of investment in Victoria's renewable energy and energy storage projects across the state in 2023/24 showed strong regional variation, reflecting the different underlying regional drivers for these projects (Table 5). Investment in Victoria's wind projects in 2023/24 was concentrated in south-west Victoria, which is endowed with strong wind resources. Large-scale solar project development occurred mainly in Victoria's north, with project developers attracted to the relatively high levels of solar irradiation in north western Victoria and the more favourable network conditions in Victoria's central north. The majority of investment in Victorian energy storage projects in 2023/24 occurred in metropolitan Melbourne and the Latrobe Valley, where large battery projects are being located to supply major demand centres. There was also significant energy storage investment in north western Victoria, where projects such as the Koorangie energy storage system are being undertaken to provide network support and accommodate increased renewable generation in weaker parts of the grid.

**Table 5: Overview of renewable energy and energy storage project development activity in Victoria during 2023/24, by region<sup>34</sup>**

	Capacity (MW)			Capex (\$ m)			Jobs		
	Wind	Solar	Storage	Wind	Solar	Storage	Wind	Solar	Storage
South West	2,076	0	14	1,189	0	0	722	0	0
North West	0	130	203	0	135	219	0	131	65
Central North	0	228	0	0	270	0	0	183	0
South East	0	24	1,050	0	8	697	0	28	147
<b>Total</b>	<b>2,076</b>	<b>382</b>	<b>1,268</b>	<b>1,189</b>	<b>412</b>	<b>916</b>	<b>722</b>	<b>341</b>	<b>212</b>

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. South West includes Barwon, Central Highlands and Great South Coast regions. Central North includes Goulburn and Ovens Murray regions. South East includes Gippsland and Melbourne regions. North West includes Mallee, Loddon Campaspe and Wimmera Southern Mallee projects.

<sup>33</sup> See [https://www.energy.vic.gov.au/\\_\\_data/assets/pdf\\_file/0026/691181/Offshore-Wind-Energy-Implementation-Statement-3.pdf](https://www.energy.vic.gov.au/__data/assets/pdf_file/0026/691181/Offshore-Wind-Energy-Implementation-Statement-3.pdf)

<sup>34</sup> Regional definitions in this table are based on Regional Development Victoria's Regional Partnerships classifications at: <https://www.rdv.vic.gov.au/regional-partnerships>

### 3. Closing statement

The VRET 2023/24 Progress Report provides a review of data and key statistics on the status and trends of the development of the renewable energy and energy storage sectors in Victoria, with a focus on outcomes achieved over the 2023/24 financial year.

Overall, 2023/24 saw Victoria’s renewable energy and energy storage industries continue to progress the strong pipeline of projects being developed across the state. This pipeline includes 2.2 GW of large-scale renewable energy projects and 1.1 GW of energy storage projects under construction or in commissioning across the state at 30 June 2024. Of this pipeline, 5 new wind and solar projects with a combined capacity of 726 MW and 11 new energy storage projects with a capacity of 1.1 GW, commenced construction in 2023/24.

Activity in Victoria’s small-scale solar sector remained at a high level as Victorian households and businesses continued to embrace rooftop solar generation and the Victorian Government’s Solar Homes Program.

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 2023/24 Progress Report – synthesis of findings**

Reporting requirements	Financial year 2023/24	Section with further detail
Progress made towards meeting the renewable energy and energy storage targets	<p>Renewable energy generation accounted for 37.8 per cent of Victoria’s electricity generation over the financial year.</p> <p>Victoria is on track to meet the 2025 target of 40 per cent renewable energy generation.</p> <p>Victorian renewable energy generation capacity now exceeds the minimum generation capacity of 11,354 MW that was estimated to be required to achieve the 2025 target. As at 30 June 2024, there was already 12,711 MW of commissioned renewable energy generation capacity in Victoria.</p> <p>As at 30 June 2024, Victoria had 557 MW of energy storage capacity that will contribute to Victoria’s energy storage targets, including 19 MW of distributed energy batteries able to contribute to Victoria’s electricity grid through aggregation arrangements with VPP providers.</p>	Section 2.1
Renewable energy and energy storage project development in Victoria	<p>Victoria’s commissioned small and large-scale renewable electricity generation capacity increased by 888 MW in 2023/24. Victoria’s commissioned energy storage capacity increased by 153 MW in 2023/24.</p> <p>As of 30 June 2024, Victoria has six wind farms and seven solar farms with a combined capacity of 2,199 MW under construction or undergoing commissioning. Victoria also had 12 energy storage projects with a combined capacity of 1,115 MW under construction or undergoing commissioning as at 30 June 2024.</p>	Section 2.2
Offshore wind sector development in Victoria	<p>Foundational work in support of Victoria’s offshore wind energy sector continued in 2023/24, including the Victorian Government’s release of Implementation Statement 3 and the Commonwealth Government awarding feasibility licences to 6 Victorian offshore wind projects.</p>	Section 2.3
Investment and employment in Victoria in relation to renewable electricity generation and energy storage	<p>Renewable generation projects commissioned during 2023/24 or under construction or undergoing commissioning as at 30 June 2024 are estimated to have resulted in capital expenditure of \$1,601 million and around 1,063 jobs in 2023/24. Energy storage projects commissioned during 2023/24 or under construction or undergoing commissioning as at 30 June 2024 are estimated to</p>	Section 2.4



have resulted in capital expenditure of \$916 million and around 212 jobs in 2023/24.

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