

Mologa Solar Farm

GHG Emissions Reduction Benefits

July 2026

Prepared for: Potentia Energy

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Urbis staff responsible for this report were:

Director Brenton Reynolds
Associate Director Angela Forero
Consultant Gitu Suresh
Project Code P0066812
Report Number Final VI

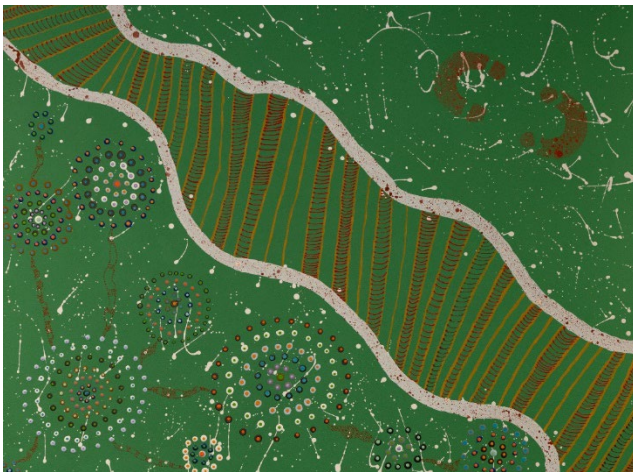
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Urbis acknowledges the Traditional Custodians of the lands we operate on. We recognise that First Nations sovereignty was never ceded and respect First Nations peoples continuing connection to these lands, waterways and ecosystems for over 60,000 years. We pay our respects to First Nations Elders, past and present.

Urbis is committed to incorporating our respect for First Nations cultures, peoples and storytelling in our work across the Country. We are proud to have partnered with Darug Nation artist, Hayley Pigram, and to profile her artwork – Sacred River Dreaming.



The river is the symbol of the Dreaming and the journey of life. The circles and lines represent people meeting and connections across time and space. When we are working in different places, we can still be connected and work towards the same goal.

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Summary

Potentia Energy is proposing to develop the Mologa Solar Hybrid Project (*the Project*), a 250 MW solar farm co-located with a 250 MW / 1,000 MWh (4-hour) Battery Energy Storage System (BESS), on a 591-hectare site in north-central Victoria. The site is bound by Bendigo Pyramid Road, Mologa-Durham Ox Road and Mitiamo-Kerang Road, approximately 50 km north-west of Bendigo, within the Loddon Shire.

Once operational, the solar farm is expected to generate approximately **637,290 MWh** of renewable electricity in its first year, displacing electricity that would otherwise have been drawn from the Victorian section of the National Electricity Market (NEM) grid from the mix of energy sources. Applying Victoria's 2025 Scope 2 grid emission factor of 0.78 kg CO₂-e/kWh, this is estimated to result in an avoided emissions benefit of approximately **497,086 tonnes of CO₂-e in Year 1** of operation, equivalent to the scope 2 emissions generated by **107,350** households in Victoria.

Victoria currently has the highest grid emission factor of any state in the National Electricity Market. This reflects the composition of the state's generation mix, which continues to rely on emissions-intensive brown coal generation for a significant share of supply, alongside a growing but still-transitioning renewable energy share. Every megawatt-hour of solar generation injected into the Victorian grid therefore avoids a comparatively carbon-intensive unit of fossil generation, making renewable energy projects in Victoria valuable from an emissions reduction perspective relative to other, cleaner-grid jurisdictions.

The Project will directly support Victoria's legislated climate and energy targets under the *Climate Change Act 2017* (Vic) and the Renewable Energy (Jobs and Investment) Act 2017 (Vic). Victoria has committed to interim emissions reduction targets of 28–33% below 2005 levels by 2025, 45–50% by 2030 and 75–80% by 2035, with a legislated pathway to net zero emissions by 2045.

Victoria has also legislated a renewable energy generation target of 65% by 2030 and 95% by 2035, alongside an energy storage target of at least 2.6 GW by 2030 and 6.3 GW by 2035.

As a 250 MW solar generator paired with a 250 MW BESS, the Project would make a measurable contribution to both the generation and storage components of the state's renewable energy targets under the *Planning and Environment Act 1987*.

The co-located BESS is a critical component of the Project's emissions reduction value proposition, beyond enabling generation that would otherwise be curtailed. Victorian solar generation is concentrated in the middle of the day, when system-wide solar output is typically at its highest and wholesale demand is comparatively low.

By contrast, Victorian electricity demand peaks in the evening, typically in the evening hours of 5:00 pm and 9:00 pm, when solar output has fallen away but demand rises. During this evening peak window, the generation mix supplying the grid is materially more emissions-intensive, as the system draws more heavily on baseload coal generation operating at higher output and on flexible gas peaking plant to meet the shortfall. By charging from surplus midday solar generation and discharging into this higher-emissions evening peak, the BESS allows the Project to displace a disproportionately carbon-intensive segment of the grid's generation stack, increasing the effective emissions reduction benefit of every MWh of solar generation captured and re-timed by the battery.

The following section sets out a detailed methodology and the full set of assumptions and sources underpinning these calculations. It should be noted that the emissions reduction figures presented in this report are calculated for Year 1 of operation only. Assuming a typical operating life for a utility-scale solar PV asset of approximately 30 years, these annual avoided emissions benefits will continue to compound over the life of the Project, subject to minor annual reductions in output associated with panel degradation and progressive decarbonisation of the Victorian grid over time, which would be expected to gradually reduce the emissions factor applied in future years.

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Detailed Methodology

This section sets out the detailed methodology, assumptions and sources used to calculate the Project's estimated Scope 2 avoided greenhouse gas emissions benefit.

Table 1 Summary overview of assumptions

Aspect	Value	Source
Project area (ha)	591	Project information
Solar PV capacity (MW)	250	Project information
BESS capacity (MW), 4-hour BESS	250	Project information
BESS total storage (MWh)	1,000	Project information
Capacity factor (%)	30%	openelectricity.org.au
Victoria grid emission factor 2025 – Scope 2 (kgCO ₂ -e/kWh)	0.78	https://www.dcceew.gov.au/climate-change/publications/national-greenhouse-accounts-factors
Hours in a year (hours)	8,760	–
Gross annual electricity generation (MWh)	657,000	Calculated: 250 MW × 8,760 hrs × 30%
Auxiliary uses and losses (%)	3%	Project assumption
Total net electricity generation (MWh)	637,290	Calculated: Gross generation less auxiliary losses
Total net electricity generation (kWh)	637,290,000	Calculated
Avoided Scope 2 emissions (kgCO ₂ -e)	497,086,200	Calculated: Net generation (kWh) × emission factor
Avoided Scope 2 emissions (tCO ₂ -e)	497,086	Calculated
Average Victorian household electricity usage (kWh/annum)	7,611	https://www.aer.gov.au/system/files/Residential_energy_consumption_benchmarks - 9 December 2020_0.pdf
Average Victorian household emissions (tCO ₂ /annum)	5.65	Calculated

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The calculation of avoided emissions considered a number of variables based on preliminary Project knowledge, including:

- **Capacity factor:** measures how much electricity a generator produces compared to what it could produce if operating at full capacity continuously, expressed as a percentage. The capacity factor of a utility-scale solar PV project can sit between 25% and 35%, depending on many factors. A figure of 30% has been assumed for this preliminary estimate, representing a mid-point.
- **Capacity factor = (actual energy output ÷ maximum possible energy output) × 100%**
- **Auxiliary uses and losses:** this represents the percentage of applicable system losses, including cable losses, inverter and conversion losses, and battery-related losses. A figure of 3% of gross generation has been assumed for the purpose of this preliminary estimate.
- **Scope 2 emissions factor for Victoria:** this represents the current Scope 2 grid emission factor for Victoria as published in the [National Greenhouse Accounts Factors 2025](#) (Department of Climate Change, Energy, the Environment and Water). This represents the most recent carbon factors made available by the Department of Climate Change, Energy, the Environment and Water.

The Victorian factor of 0.78 kg CO₂-e/kWh represents the average emission intensity of electricity supplied through the Victorian section of the National Electricity Market and reflects Victoria's ongoing reliance on brown coal generation, making it the highest emission factor of any NEM region.

Battery Energy Storage System (BESS)

In addition to enabling the recovery of generation that would otherwise be potentially curtailed, the 250 MW / 1,000 MWh BESS will support the grid by shifting solar generation from the middle of the day, when Victorian solar output and renewable generation are typically abundant, to the evening peak demand period, when renewable generation is lower and demand is higher.

The BESS will help displace fossil fuel generation during this peak demand window, which in Victoria typically occurs between 5:00 pm and 9:00 pm, when the generation mix relies more heavily on baseload coal plant operating at higher output and on gas peaking generation brought online to meet the shortfall. By discharging stored solar energy into this higher-emissions window, the BESS increases the effective carbon abatement value of the Project's solar generation beyond what the solar farm could achieve on a standalone basis.

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