OUR CLIMATE TRANSITION PLAN

Melbourne Water's path to reducing greenhouse gas emissions

Melbourne Water

Acknowledgement of Country

Melbourne Water respectfully acknowledges Aboriginal and Torres Strait Islander peoples as the Traditional Owners and custodians of the land and water on which all Australians rely. We pay our respects to Bunurong, Gunaikurnai, Taungurung, Wadawurrung and Wurundjeri Woi-wurrung peoples as the Traditional Owners and Custodians of the land and water on which we rely and operate.

We pay our deepest respects to their Elders past, present and emerging. We recognise and respect the continued cultural and spiritual connections that Aboriginal and Torres Strait Islander peoples have with the land and water they have cared for and protected for thousands of generations.

We demonstrate our ongoing commitment to reconciliation through our partnerships with Traditional Owners and the broader Aboriginal and Torres Strait Islander communities, as we work together to manage land and water now and into the future, while maintaining and respecting cultural and spiritual connections.

Our Climate Transition Plan

Water is essential to our way of life; and so is the work we do. Everyday Melbourne Water provides essential services that sustain the health, liveability and environment in our region.

We recognise that the actions we take today will significantly impact people and the environment for generations to come. We have an opportunity now to shape water delivery, the health and wellbeing of our waterways, and the way we recover, treat and re-use waste products from our sewerage system for future generations.

The water industry is a significant source of emissions as providing water and treating sewage produces greenhouse gases and uses a lot of energy. While we are already planning, adapting and decarbonising our water supply, sewerage and drainage systems to reduce emissions and prepare for a changing climate, we know there is more to do.

Our Climate Transition Plan takes a holistic approach to ensure we measure and evaluate our impacts, plan for resilience across our operations, collaborate with our partners and consider the environmental, social, cultural and economic outcomes for our region. Alongside this, Melbourne Water is taking advantage of its unique position to generate and use renewable electricity.

Our approach to preparing for the physical impacts of climate change is touched on in this Plan, however, more detail is provided in our long-term service strategies.

Melbourne Water is also planning for population growth and new water sources. As we expand and renew our assets to provide for a growing region we have an opportunity to create infrastrucutre that is more resilient and sustainable. We are collaborating with communities and partners, both in Australia and internationally, to transition to a future where energy is sourced renewably, and sewage is treated and re-used more effectively.

Our Climate Transition Plan outlines our ambition, challenges, and actions to systematically reduce emissions while we provide resilient services to communities now and in future.

Dr Nerina Di Lorenzo
Managing Director

Our commitment to reducing emissions

Melbourne Water's services produce significant greenhouse gas emissions, mainly through electricity usage and direct emissions created as we treat and transfer drinking water and treat Melbourne's sewage. We estimate that these services could contribute up to 0.5 per cent of Victoria's total emissions.

We manage catchments, water storages and the water transfer network to meet the needs of a growing city and the surrounding region, supplying around 500 billion litres of drinking water each year. We also work to protect and improve over 25,000 kilometres of waterways, wetlands and estuaries, and flood protection and drainage systems throughout the region. Our Eastern and Western Treatment Plants treat over 350 billion litres of sewage each year; approximately 90 per cent of Greater Melbourne's sewage. Combined with an extensive 400-kilometre network of sewers and nine sewage pumping stations, Melbourne Water transports substantial volumes of sewage across the city for treatment every day.

Melbourne's population is set to grow to over 10 million by 2050, increasing the need for drinking water, sanitation and all water services. In turn this generates a requirement for further infrastructure including for sewerage, waste treatment and resource recovery, such as recycled water. And, as the climate changes, our operations must withstand increased impacts from drought, bushfires in our catchments, floods and rising sea levels.

To prepare for the challenges of the future, Our Climate Transition Plan aims to ensure we understand our emissions, collaborate with others to create innovative solutions and implement our actions in a way that provides social, financial, environmental and cultural benefits for Greater Melbourne now and in the future.

Our Climate Transition Plan is focused on where we can have the greatest impact. Victoria's Climate Change Strategy and regulations guide our approach and use the term 'Net Zero'. More details on the types of emissions included in our current targets are on page 4.

Net zero does not mean Melbourne Water will not produce any emissions. It means we will remove as much greenhouse gas from the atmosphere as we produce. While we build the technical and scientific knowledge and construct the infrastructure to transform our sewage treatment plants to the low emissions technologies required to reduce or avoid emissions, we will invest in high-integrity carbon credits to offset our emissions in the meantime.

What is t CO_2-e?

Melbourne Water measures and reports emissions in tonnes of carbon dioxide equivalent (CO_2-e). This is a standardised unit for reporting greenhouse gas. We multiply the tonnes of each greenhouse gas (such as methane or nitrous oxide) by its global warming potential to estimate the emissions that would have occurred if all emissions were released as carbon dioxide.

Our obligations

Melbourne Water's emission targets are guided by state and federal regulations and climate goals. Guiding regulations include:

- Victorian Statement of Obligations – Emission Reduction (SoO (ER)).
- Federal Safeguard Mechanism.

Under these obligations Melbourne Water is required to:

- Use 100 per cent renewable electricity by the end of 2025, netting scope 2 to zero.
- Reduce or net total reportable scope 1 and 2 emissions by half (or down to 204,380 t CO_2-e) by 2025 (relative to a 2011-2016 baseline).
- Reduce or net total reportable scope 1 and 2 emissions to zero by 2030.
- Decrease or net scope 1 emissions below Federal Safeguard Mechanism baselines at the Eastern and Western Treatment Plants.

Reporting

When tracking progress toward our SoO(ER) target, Melbourne Water's greenhouse gas emissions are reported based on the sum of scope 1 and scope 2 emissions.

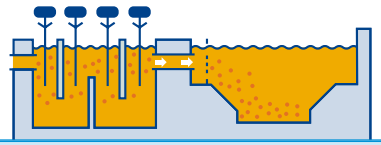
Australia's National Greenhouse and Energy Reporting Scheme (NGERS) regulates how Australian entities, including Melbourne Water, estimate and report greenhouse gas emissions.

The Federal Department of Climate Change, Energy, the Environment and Water is responsible for setting and updating the NGERS Measurement Determination. This sets the methods we can use to estimate emissions. Updates are critical as the world's understanding of emissions increases and evolves over time.

How we account for emissions under three 'scopes'

Scope 1

Direct emissions (or fugitive emissions), generated as a result of an activity under our operational control. For Melbourne Water, scope 1 emissions are mostly released through sewage treatment.

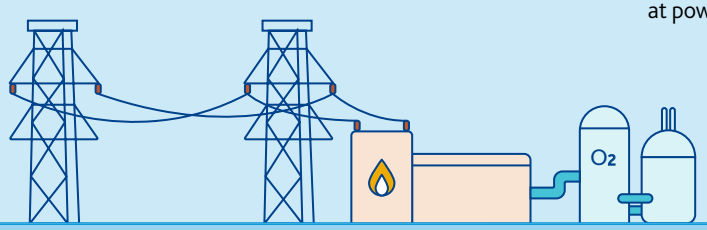


Examples of Scope 1 emissions at Melbourne Water

- Nitrous oxide from nutrient removal aeration tanks at our sewage treatment plants.
- Methane emissions from sludge drying pans and treatment lagoons at our sewage treatment plants (see page 9 for more information on sludge drying and lagoons).
- Carbon dioxide from biogas flaring (safely destroying biogas we cannot use for power).

Scope 2

Indirect emissions generated from the consumption of grid electricity derived from fossil fuels.



Examples of Scope 2 emissions at Melbourne Water

- The use of grid electricity, produced by burning fossil fuel at power plants elsewhere, to run our operations.

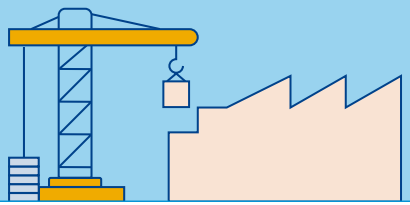
Scope 3

All indirect emissions (excluding scope 2) that occur in the supply chain, including both upstream (supplier) and downstream (customers) emissions.

Scope 3 emission reduction is not included in current targets. However, we are in the process of understanding these emissions and opportunities to reduce them.

Examples of Scope 3 emissions at Melbourne Water

- Use of purchased construction materials, such as concrete, to build or repair water and sewerage infrastructure.



Our emissions

It is estimated that the sewage treatment and other water services we provide for Greater Melbourne contribute about 0.5 per cent to Victoria's total emissions.

Currently, over 95 per cent of Melbourne Water's scope 1 emissions are nitrous oxide and methane from sewage treatment.

Around 70 per cent of Melbourne Water's scope 2 emissions come from the electricity required in sewage transfer and treatment processes.

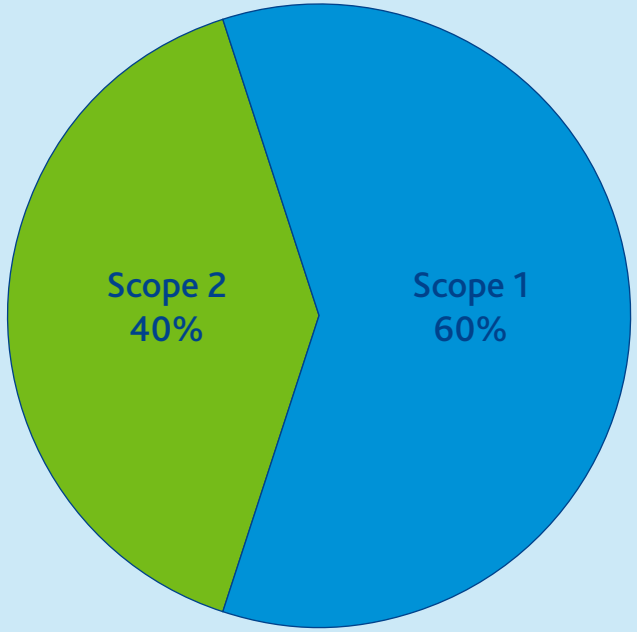
Reducing our scope 1 and 2 emissions at the Eastern and Western Treatment Plants is key to achieving our decarbonisation goals.

While we are working on this challenging task, we are using carbon credits to contribute to global emission reduction targets and meeting our obligations.

In 2024-25, Melbourne Water's reported scope 1 and scope 2 emissions were 236,917 and 158,999 t CO_2-e respectively. Our reported net emissions after retiring carbon credits were 204,379 t CO_2-e.

Total reported emissions 2024-25: 395,916 t CO_2-e

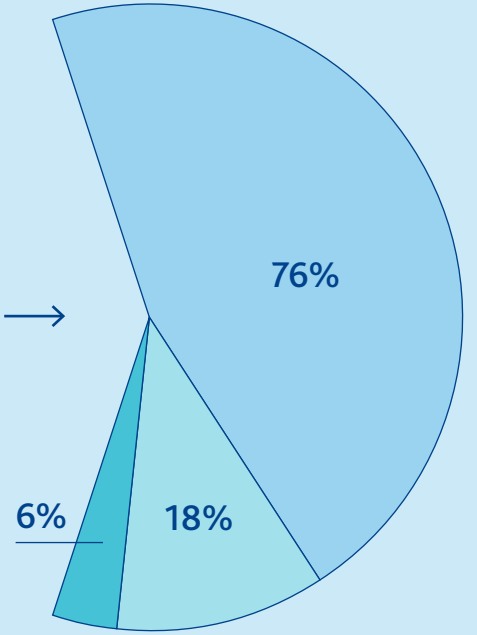
Scope 1 and 2



Scope 2 (electricity)

Scope 1 (direct)

Scope 1 breakdown



Around 95 per cent of our scope 1 emissions are fugitive emissions of methane and nitrous oxide from sewage treatment.

Methane from sewage treatment

Nitrous oxide from sewage treatment

Scope 1 emissions from all other Melbourne Water operational sources

All data is sourced from Melbourne Water's 2024-25 Annual Report All measurements in t CO_2-e

Since 1 July 2025, Melbourne Water has transitioned to using 100 per cent renewable electricity. This 'nets' off all scope 2 emissions from that time onward.

Our Climate Transition Plan

Measure, collaborate, implement

What have we already achieved?

Met our first emissions target of no more than 204,380 t CO_2-e for the 2024-25 financial year and our 100 per cent (net) renewable energy target from 1 July 2025.

Biogas capture reducing scope 1 emissions and used for on-site renewable electricity and heat generation at both the Eastern and Western Treatment Plants.

Over 24 Megawatts of installed biogas generation capacity.

In addition to biogas generation, Melbourne Water has also invested in a significant portfolio of renewable energy generation, including large scale solar (at the Eastern Treatment Plant and Winneke) and a network of 16 mini-hydro generators through our water supply system.

In total, our renewable energy portfolio spans over 20 sites and has approximately 80 Megawatt installed capacity.

These facilities add renewable energy to the electricity grid, and will contribute to our ongoing use of 100 per cent renewable electricity.

What is the current focus?

Planning for implementation of low emission alternatives, with a focus on mature technologies to lower methane emissions from sludge drying and lagoons.

Engage stakeholders in how we can deliver on Our Climate Transition Plan, and adapt the Eastern and Western Treatment Plants, transforming to lower emission and more resilient treatment processes.

Collaborating across the water sector to improve measurement and detailed understanding of emissions sources, and identify low emission technologies and solutions.

Use our portfolio of on-site renewable electricity generation and buy renewable electricity to maintain our renewable electricity target.

Continue sourcing high-integrity carbon credits to maintain our current scope 1 and 2 target of not more than 204,380 t CO_2-e per year.

How will we reduce our emissions and reliance on carbon credits in the future?

Net Zero Acceleration Hub – driving global collaboration and technology advances (more information available on page 8).

Transformation of Sewage Treatment Plants to reduce scope 1 emissions, working with stakeholders on the scale and timing of investment.

While also planning for climate resilience, environmental values and high quality services:

- Community needs and public health.
- Protecting Port Phillip Bay and Ramsar wetlands at the Western Treatment Plant.
- Protecting the marine environment and recreation around Boag Rocks.
- Climate change (wet weather, coastal erosion, sea level rise).
- Resource recovery, including recycled water.
- Amenity (especially odour).
- Land and groundwater contamination risks.
- Protect onsite biodiversity, flora and fauna.

Measure

Reporting transparently and fully disclosing our emissions based on site-specific data is key to cutting our emissions.

Further evidence of our actual emissions will allow us to better focus on the areas with the greatest impact and minimise our contribution to climate change.

While our emissions are currently estimated using NGERS methods, these methods are not specific to Melbourne Water's operations.

To better understand our actual emissions, Melbourne Water is undertaking a range of direct emission measurement initiatives and collaborating with research partners and water corporations, both domestically and internationally, to inform measurement standards, including:

- Improving the understanding of nitrous oxide emissions to support standard measurement techniques and more accurate emission reporting approaches. This is an industry collaborative research project, in partnership with other Australian water utilities, supported by an Australian Research Council Linkage Grant.
- Methane leak detection investigations at the Eastern Treatment Plant.
- Targeted emissions measurement campaigns at our Western Treatment Plant lagoons and Eastern Treatment Plant sludge drying pans.
- Field measurements support by modeling to understand emissions from Western Treatment Plant lagoons.

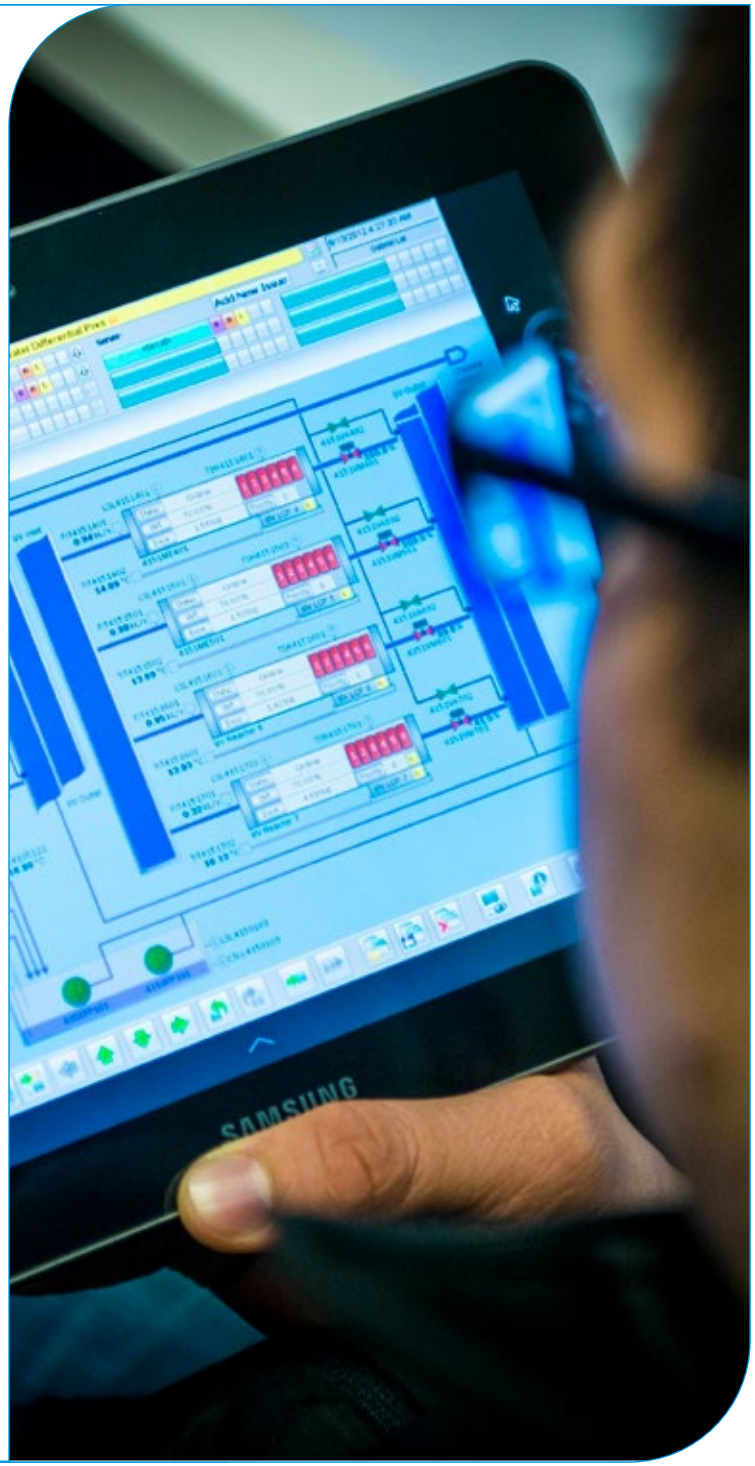
Melbourne Water is focused on measuring nitrous oxide and methane as these are the main types of greenhouse gas emitted by sewage treatment.

Methane

Around 80 per cent of Melbourne Water's NGERS reported scope 1 emissions are associated with methane produced from sewage treatment processes. Our understanding of actual methane emissions are likely to vary as we learn more via our emission measurement program.

Nitrous oxide

Based on current NGERS reporting, around 20 per cent of Melbourne Water's scope 1 emissions are nitrous oxide from biological nitrogen removal processes. Actual emissions may vary. For example, our direct emission measurement project at the Western Treatment Plant indicates that nitrous oxide emissions at this site may be up to 2.8 times higher than current NGERS reported emissions. Nitrous oxide has not yet been measured at the Eastern Treatment Plant (planning is underway).



Collaborate

Our Climate Transition Plan cannot be achieved alone. Melbourne Water is working with our partners and the water industry to build on experiences, expertise and innovation capacities. Through knowledge sharing, we can better understand our emissions, implement new technologies and meet our challenges to reduce our collective emissions.

International partnership to reduce sewage emissions

Melbourne Water's partnership with Danish water company Aarhus Vand, Italy's GruppoCAP and UK's Severn Trent aims to co-develop technologies and innovations to make sewage treatment greener and begin to establish new international standards for measuring and reporting emissions. This collaboration allows Melbourne Water and our partners to build on and share experience, expertise and innovations.

Working together to accelerate low emission technologies

Melbourne Water is currently planning to construct an Acceleration Hub at our Eastern Treatment Plant to catalyse the development of low emissions treatment options for the future.

The Acceleration Hub will enable testing of alternative nitrogen removal treatment processes that capture and destroy nitrous oxide. Results from this work will be shared with our local and international partners to help accelerate the development of low emissions technologies for the sector.

Implement

Reducing Melbourne Water's scope 1 emissions at the Eastern and Western Treatment Plants is key to achieving our decarbonisation goals and reducing our reliance on carbon credits to 'net' emissions down to target levels. To ensure Melbourne's sewerage system continues to protect community health without increasing greenhouse gas emissions, we need to transform for the future. The size and scale of this transformation requires significant investment in new technologies and infrastructure. The timing and scale of investments will be shaped by input from customers, communities and regulators.

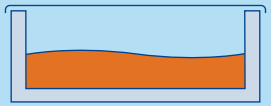
Western Treatment Plant

The Western Treatment Plant treats over half of Melbourne's sewage, providing an essential service that protects public health and Port Phillip Bay. The most significant investment to reduce emissions will be required at the Western Treatment Plant. This involves shifting the site's reliance on lagoons and sludge drying pans for treatment towards a more modern, smaller carbon-footprint sewage treatment process. While transitioning, we must also retain the significant and unique biodiversity values of the site.

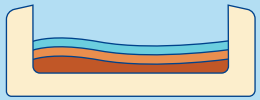
Eastern Treatment Plant

Although 10 times smaller in area than the Western Treatment Plant, the Eastern Treatment Plant treats almost half of Melbourne's sewage. The Eastern Treatment Plant is a modern mechanised treatment plant (no lagoon based treatment), however it still has certain areas responsible for significant greenhouse gas emissions. The highest priority at the site is to move away from sludge drying pans.

ANAEROBIC LAGOONS



LAGOON TREATMENT



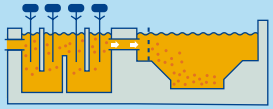
Reducing our reliance on lagoons for treatment purposes

- Repurposing of treatment lagoons for biodiversity purposes only – breaking this link between the Western Treatment Plant's biodiversity values and treatment is strategically transformational.
- Lagoons are one of the largest emission sources during methane capture system maintenance activities.

Recovery & Re-Use Complex

- The Recovery & Re-Use Complex (under construction) will add additional capacity, starting to take the load off lagoons for treatment.

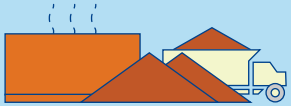
NUTRIENT REMOVAL PLANTS



Optimising nutrient removal processes and exploring innovations for the future

- Measurement and collaboration activities are focused on better understanding and optimising these processes to reduce nitrous oxide emissions.
- Innovation to explore options to capture and destroy or consider alternative treatment processes to eliminate these emissions.

SLUDGE DRYING PANS, STOCKPILES AND SOLIDS PRODUCTS



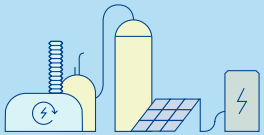
Transforming to a thermal future

- Current open air sludge drying pans are responsible for approximately half of Melbourne Water's reportable scope 1 emissions.
- By transforming to mechanical and thermal drying, coupled with a new thermal process to produce an alternative solids product, Melbourne Water's emissions will be reduced significantly.

Eliminating sludge drying pans has multiple benefits

- Removes a large source of odour, groundwater contamination risks, frees a large footprint of land and removes a process with poor climate resilience and performance in wet weather.
- Thermal technologies have the capacity to destroy emerging contaminants.

ON-SITE RENEWABLE ENERGY GENERATION



Generation of renewable energy

- On-site biogas generation utilising biogas byproduct of sewage treatment.
- From 1 July 2025, source 100 per cent renewable electricity.

Electric vehicles

While fleet vehicles contribute only a small proportion of our scope 1 emissions, they offer a good opportunity for immediate reductions. Of the 400 Melbourne Water vehicles, approximately 90 are Electric Vehicles. The remainder of our fleet are made up of operational vehicles where there are currently no comparable Electric Vehicles available in Australia. Where possible, Melbourne Water will not purchase additional Internal Combustion Energy vehicles where a comparable Electric Vehicle exists in the market.

Carbon Credits

Melbourne Water is developing a series of small-scale, pilot carbon forests within our region to build capacity and explore the co-benefits of biodiverse carbon plantings.

As it takes time for the trees to grow and store carbon, carbon credits generated from these plantings will be available in approximately five years time.

To meet our ongoing carbon targets, Melbourne Water will need to use a large quantity of carbon credits as we tackle the challenges of reducing emissions at the source.

While we develop the technology and investment business cases we need to replace sewage treatment infrastructure, we will use these credits to 'offset' scope 1 emissions.

We will focus on sourcing high-integrity credits, and will share information about these each year in our Annual Report.

A carbon credit is a certificate representing a project or activity elsewhere that abates greenhouse gas emissions or sequesters carbon from the atmosphere. One carbon credit usually represents one tonne of CO_2-e.

Resilient renewable energy

In addition to our on-site solar energy, we use energy from our biogas power plants at the Eastern and Western Treatment Plants. Where we cannot create our own electricity, we import renewable electricity from the grid.

Melbourne Water operates critical infrastructure sites that provide essential services to Melburnians every day. Therefore, it's crucial for our operations to use resilient power sources, including connections to the grid. During emergencies this may include diesel generated back up power to guarantee delivery of essential services, such as drinking water treatment.

Electricity is responsible for Melbourne Water's reportable scope 2 greenhouse gas emissions. We have been using 100 per cent renewable electricity since 1 July 2025 through a combination of generating renewable power within our operations, such as biogas and solar, and buying renewable electricity.

Melbourne Water is also reviewing further opportunities to build our own renewable facilities where it makes technical and economic sense for our sites.

As Greater Melbourne's population grows, our electricity loads are forecast to increase across the water and sewerage systems. A bigger population will increase the need for water treatment, pumping larger volumes of manufactured water through the network, increased sewage treatment to meet discharge requirements, and further the need for recycled water, which all require energy intensive processes.

Generating and purchasing renewable electricity

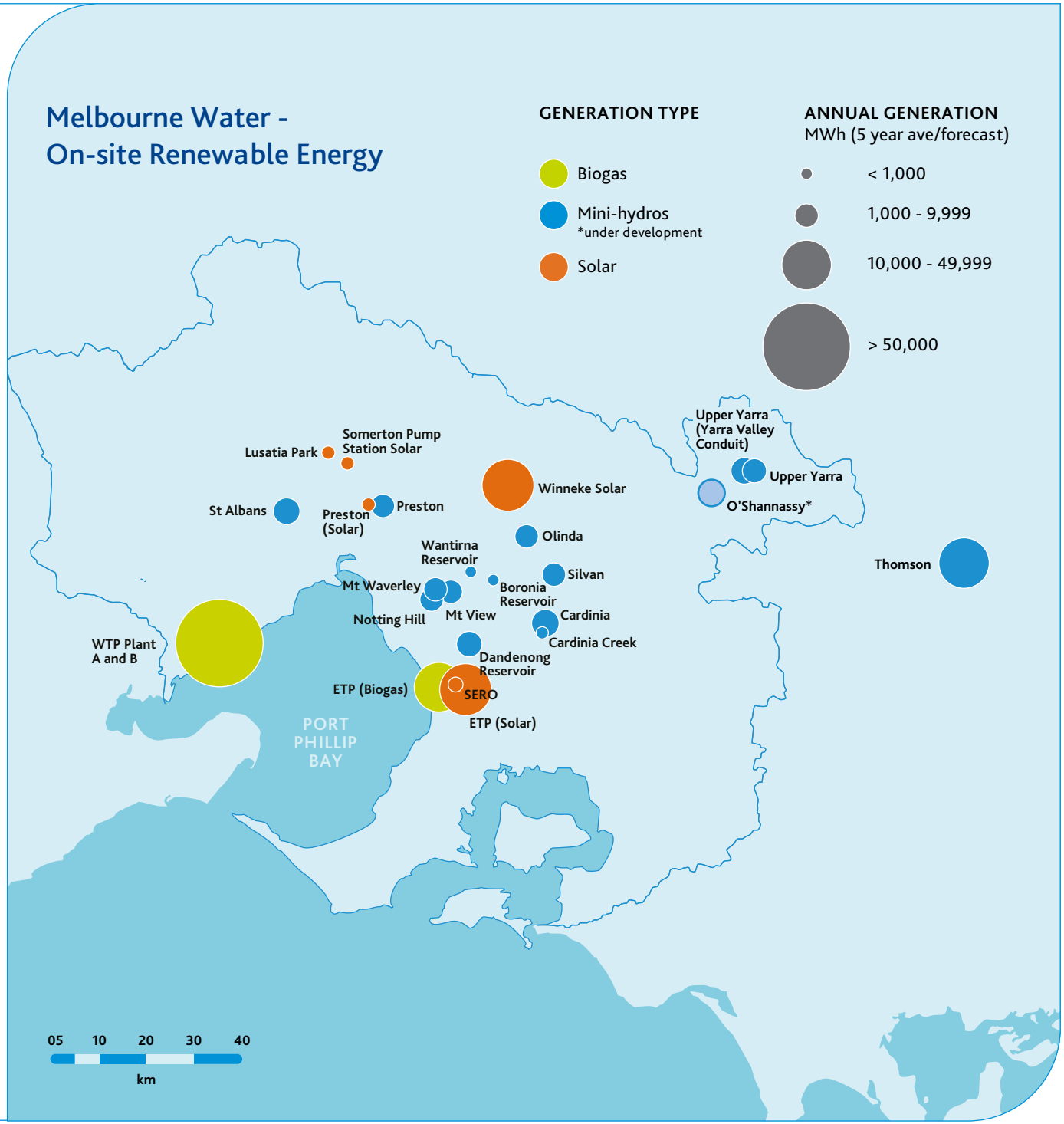
Renewable Energy Certificates

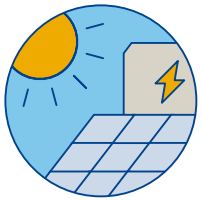
Melbourne Water used 100 per cent renewable electricity from 1 July 2025 through a combination of on-site renewable electricity generation and retiring Renewable Energy Certificates (RECs)*.

RECs are a certificate issued by a relevant regulator/authority for the generation of renewable electricity by an accredited renewable energy power station in Australia. The majority of Melbourne Water's renewable energy portfolio earns one REC for every 1 Megawatt hour.

The REC scheme in its current form is set to end in 2030. It is anticipated a new or similar scheme will be adopted in its place. Until this time and under the SoO (ER), only RECs can be used to 'net' our scope 2 emissions.

**Specifically, Melbourne Water earns and will retire Large-Scale Generation Certificates (LGCs), which are a type of Renewable Energy Certificate.*

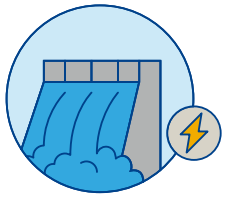




On-site Solar

Eastern Treatment Plant - generates 30,000 Megawatt hours / annum on average making it one of the largest behind the meter solar installations in Australia.

Winneke solar farm - generates up to around 13,000 Megawatt hours / annum on average, equivalent to approximately 20,000 t CO_2-e in 2024-25.



Hydropower

Since 1984, Melbourne Water has generated hydroelectricity throughout our water supply network using mini-hydros. Currently, 15 mini-hydro power stations are in operation at our water supply reservoirs.

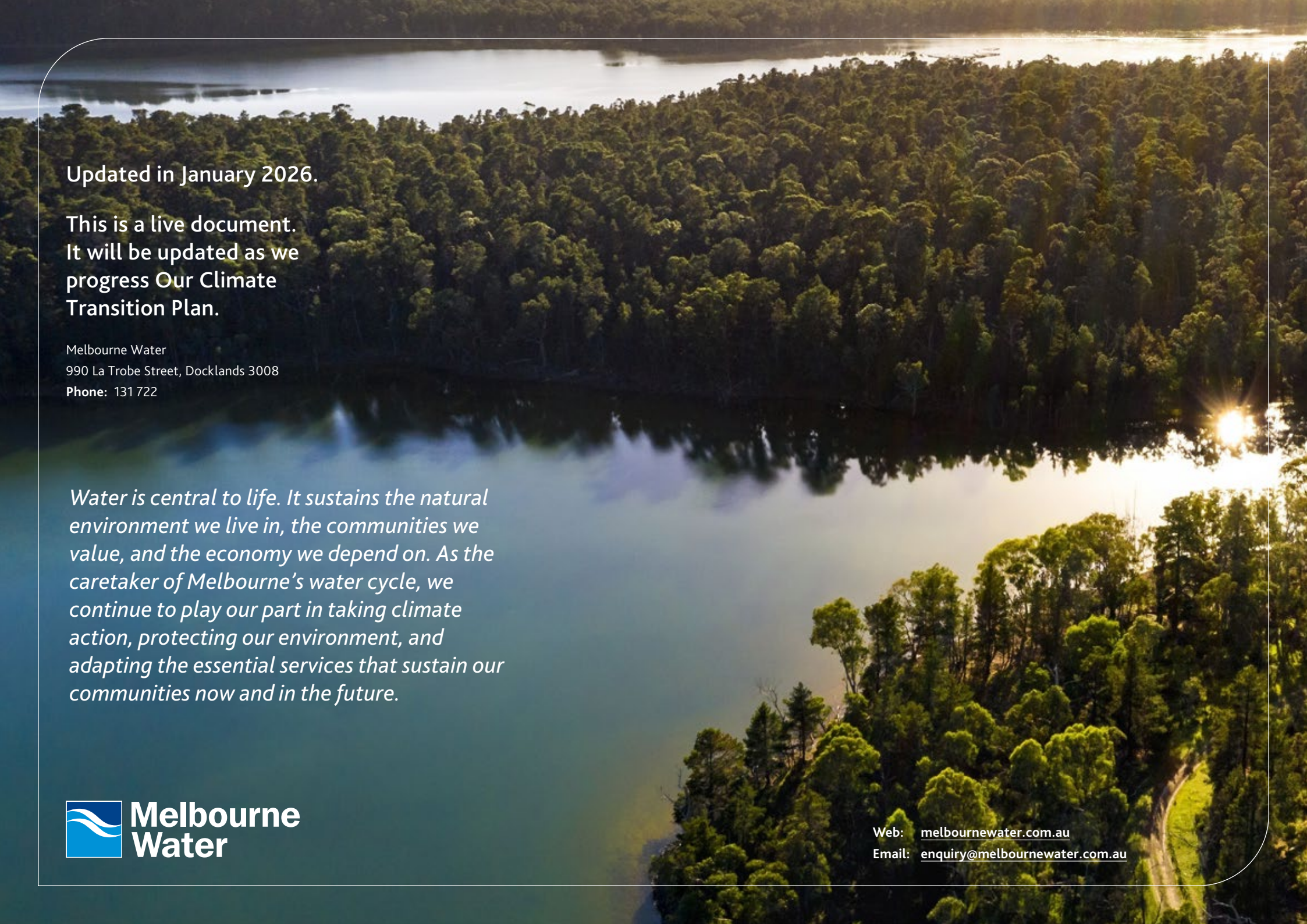
Mini-hydros work by converting energy from the pressure and flow of water going into the water supply network to generate electricity. This electricity is then fed back into the power grid and used to reduce operating costs. Up to 70,000 Megawatt hours of power are generated through our mini-hydros each year.

Biogas

Our sewage treatment process produces biogas that is used to generate electricity and power our two treatment plants. When sewage breaks down in an anaerobic (oxygen-free) environment, it releases biogas made up of mostly methane and carbon dioxide. Melbourne Water captures this biogas and converts it to energy.

The Eastern and Western Treatment Plants currently use biogas to power approximately an average of 45 per cent of the combined electricity usage. When there is more electricity produced than can be used on site, this renewable electricity is exported to the grid, saving our customers money.

These facilities add renewable energy to the Victorian electricity grid, and help Melbourne Water use 100 per cent renewable electricity.



Updated in January 2026.

This is a live document. It will be updated as we progress Our Climate Transition Plan.

Melbourne Water
990 La Trobe Street, Docklands 3008
Phone: 131 722

Water is central to life. It sustains the natural environment we live in, the communities we value, and the economy we depend on. As the caretaker of Melbourne's water cycle, we continue to play our part in taking climate action, protecting our environment, and adapting the essential services that sustain our communities now and in the future.

Melbourne Water

Web: melbournewater.com.au
Email: enquiry@melbournewater.com.au